SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

(Affiliated to J.N.T. University Anantapur)

ACADEMIC REGULATIONS

B.Tech. Regular Four Year Degree Programme

(for the batches admitted from the academic year 2011–12)

&

B.Tech. (Lateral Entry Scheme)

(for the batches admitted from the academic year 2012–13)

For pursuing four year undergraduate Bachelor Degree programme of study in Engineering (B.Tech) offered by Sree Vidyanikethan Engineering College under Autonomous status and herein after referred to as SVEC (Autonomous):

1. Applicability : All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2010-2011 onwards. Any reference to "College" in these rules and regulations stands for Sree Vidyanikethan Engineering College (Autonomous).

2. Extent : All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sree Vidyanikethan Engineering College shall be the Chairman, Academic Council.

3. Admission :

3.1. Admission into first year of Four Year B.Tech. Degree programme of study in Engineering:

3.1.1. Eligibility : A candidate seeking admission into the First Year of four year B.Tech. Degree Programme should have

(i) passed either Intermediate Public Examination (I.P.E) conducted by the Board of Intermediate Education, Andhra Pradesh, with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by JNTUA, Anantapur) or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by JNTUA, Anantapur) for admission as per the guidelines of APSCHE.

(ii) secured a rank in the EAMCET examination conducted by A.P. State Council for Higher Education for allotment of a seat by the Convener, EAMCET, for admission.

3.1.2. Admission Procedure: Admissions are made into the first year of four year B.Tech. Degree programme as per the stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

(a) By the Convener, EAMCET, (for Category-A Seats).

(b) By the Management (for Category-B Seats).

3.2. Admission into the Second Year of Four year B.Tech. Degree programme in Engineering

3.2.1. Eligibility: Candidates qualified in ECET (FDH) and admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained.

3.2.2. Admission Procedure: 10% of the sanctioned strength in each programme of study as lateral entry students or as stipulated by APSCHE shall be filled by the Convener, ECET (FDH).

4. Programmes of study offered leading to the award of B.Tech. degree

Following are the four year undergraduate Degree programmes of study offered in various branches in SVEC (Autonomous) leading to the award of B.Tech. (Bachelor of Technology) Degree:

1) B.Tech. (Biotechnology)
2) B.Tech. (Civil Engineering)
3) B.Tech. (Computer Science & Engineering)
4) B.Tech. (Computer Science & Systems Engineering)
5) B.Tech. (Electrical & Electronics Engineering)
6) B.Tech. (Electronics & Communication Engineering)
7) B.Tech. (Electronics & Control Engineering)
8) B.Tech. (Electronics & Instrumentation Engineering)
9) B.Tech. (Information Technology)
10) B.Tech. (Mechanical Engineering)

5. Academic Year: The College shall follow Year-wise pattern for First year course of four year B.Tech programme and Semester system from second year onwards for conducting all its curricula. An academic year shall consist of a first semester and a second semester from second year onwards and the summer term follows in sequence.

The first year of four year B.Tech programme shall have a duration to accommodate a minimum of 31 instructional weeks. The first and second semesters (from second year onwards) shall have the duration to accommodate a minimum of 17 instructional weeks per semester.

First Year B.Tech (38 weeks)	Instruction Period: I Spell :11 weeks II Spell :10 weeks III Spell :10 weeks Mid Examinations: I Mid :1 week II Mid :1 week III Mid :1 week	34 weeks
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
	Summer vacation	4 weeks
First Semester (23 weeks)	Instruction Period: I Spell :9 weeks II Spell :8 weeks Mid Examinations: I Mid :1 week II Mid :1 week	19 weeks
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Second Semester (23 weeks)	Semester Break	2 weeks
	Instruction Period: I Spell :9 weeks II Spell :8 weeks Mid Examinations: I Mid :1 week II Mid :1 week	19 weeks
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
	Summer vacation	4 weeks

6. Course Structure : Each programme of study shall consist of:

- General Courses comprising of the following:
  - i. Language / Communication Skills
  - ii. Humanities and Social Sciences
  - iii. Economics and Principles of Management
  - iv. Environmental Sciences

The above courses are common to all branches.

- Basic Science Courses comprising of the following:
    i. Computer Literacy with Numerical Analysis
    ii. Mathematics
    iii. Physics
    iv. Chemistry

The above courses are common to all branches.

- Core Engineering Courses comprising of the following, depending on the branch:
    i. Engineering Graphics
    ii. Workshop Practice
    iii. Engineering Mechanics
    iv. Electrical Sciences
    v. Thermodynamics and Heat Transfer
    vi. Material Sciences and Engineering
    vii. Engineering Systems Design
    viii. Building Materials
    ix. Surveying
    x. Transport Phenomena
    xi. Basic Electronics
    xii. Computer Programming
- Compulsory Discipline Courses:

The list of professional subjects are chosen as per the suggestions of the experts, to impart broad based knowledge needed in the concerned branch of study.

- Elective Courses:

  Electives will be offered to the students to diversify the spectrum of knowledge. The electives can be chosen based on the interest of the student to broaden his individual skill and knowledge.

The students shall complete:

- A mini project in an industry during the summer term following the second semester of third year B.Tech. programme for a period of 4 weeks. A report shall be submitted to the Department after successful completion of the mini project.

Every programme of study shall be designed to have 40-42 theory courses and 14-16 laboratory courses. Distribution of types of courses is indicated below:

General Courses	5-10%
Basic Science Courses	15-25%
Core Engineering Courses	15-25%
Compulsory Discipline Courses	45-55%
Elective Courses	10-15%

Note: All components prescribed in the curriculum of any programme of study shall be conducted and evaluated.

Contact Periods : Depending on the complexity and volume of the course, the number of contact periods per week will be assigned.

7. Credit System: Credits are assigned based on the following norms.

Norms for assigning credits are shown below :

Subject	Year Pattern		Semester Pattern	
	Period(s)/ Week	Credits	Period(s)/ Week	Credit(s)
Theory	01	02	01	01
Practical	03	04	03	02
Mini Project	--	--	--	02
Seminar	--	--	--	02
Comprehensive Viva-Voce	--	--	--	02
Final Year Project	--	--	--	12

i. As a norm, for the theory subjects, **one credit** for one contact period per week is assigned in semester system. In yearly pattern **two credits** for one contact period per week is assigned.

ii. As a norm, for practical courses **two credits** will be assigned for three contact periods per week in semester pattern. In yearly pattern **four credits** will be assigned for three contact periods per week.

iii. Tutorials do not carry any credits. However, each of the analytical and problem oriented courses will have one tutorial hour per week. Audit courses do not carry any credits.

iv. For courses like Mini Project/Project/Seminar/Comprehensive Viva-Voce, where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

- The four year curriculum of any B.Tech. programme of study shall have total of 220 credits. The exact requirements of credits for each course will be as recommended by the concerned Board of Studies and approved by the Academic Council.
- In the case of lateral entry students, B.Tech. programme for II, III, IV years of study shall have a total 170 credits.

8. Examination System : All components in any programme of study will be evaluated continuously through internal evaluation and an external evaluation component conducted as year-end/semester-end examination.

8.1. Distribution of Marks:

<table>
<tr><th>S.No.</th><th>Examination</th><th>Marks</th><th colspan="2">Examination and Evaluation</th><th>Scheme of examination</th></tr>
<tr><td rowspan="3">1</td><td rowspan="3">Theory</td><td>70</td><td colspan="2">Year-end / Semester-end examination (external evaluation)</td><td>The examination question paper in theory subjects will be for a maximum of 70 marks. The question paper shall be of descriptive type with 8 questions out of which 5 are to be answered in 3 hours duration of the examination.</td></tr>
<tr><td rowspan="2">30</td><td rowspan="2">20</td><td rowspan="2">Mid - Examination of 90 Min. duration (Internal evaluation). The question paper shall be of descriptive type with 5 questions out of which 3 are to be answered and evaluated for 20 marks.</td><td><u>For I B.Tech:</u> Three (03) mid-term exams, each for 20 marks are to be conducted. For a total of 20 marks, average of the best two mid-term exams shall be considered.
Mid-I: After first spell of instructions (I and II Units).
Mid-II: After second spell of instructions (III to V Units).
Mid-III: After third spell of instructions (VI to VIII Units)</td></tr>
<tr><td><u>For a Semester:</u> Two midterm exams , each for 20 marks are to be conducted. For a total of 20 marks, better of the two shall be considered.
Mid-I: After first spell of instructions (I to IV Units).
Mid-II: After second spell of instructions (V to VIII Units).</td></tr>
</table>

			10	Assignment Tests (Internal evaluation)	For I B.Tech: Three assignment tests each of 10 marks shall be conducted. Average of best two assignment tests shall be taken as internal marks for the assignments.
					For a Semester: Two assignment tests each of 10 marks shall be conducted. Better of the two assignments shall be internal marks for the assignments.
2	Laboratory	50	Year-end / Semester-end Lab Examination (External evaluation)		50 marks are allotted for laboratory/ drawing examination during year-end / semester-end.
		25	15	Day-to-Day evaluation	Performance in laboratory experiments/ drawing and record.
			10	Internal evaluation	Practical Tests. (For first year three tests and for semester two tests.)
3	a) Seminar	75	75	Internal evaluation	Continuous evaluation during a semester by the Departmental Committee (DC).
	b) Comprehensive Viva-Voce	100	100	Internal evaluation	Viva-voce examination conducted during IV Year II Sem. by the DC.
4	Mini Project	75	50	External evaluation	Semester-end Mini-Project Viva-Voce Examination by a Committee similar to that of Project work evaluation.
			25	Internal evaluation	Continuous evaluation by the DC

5	Project Work	225	150	External evaluation	Semester-end Project Viva-Voce Examination by Committee as detailed under 8.2.
			75	Internal evaluation	Continuous evaluation by the DC

8.2 Seminar/ Project Work / Machine Drawing Evaluation:

i. There shall be a seminar presentation in III year II Semester. For the seminar, the student shall collect information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the Department before presentation. The report and the presentation shall be evaluated by the Departmental Committee (**DC**) consisting of Head of the Department, supervisor and a senior faculty member. There shall be no external examination for seminar.

ii. The Semester-End Examination (Project viva-voce) shall be conducted by a Committee consisting of an External examiner nominated by the Chief Controller of Examinations, HOD & Supervisor. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be made by the Departmental Committee, on the basis of two seminars presented by each student on the topic of his project.

iii. For the subject Machine Drawing, the distribution shall be 30 marks for internal evaluation and 70 marks for end examination. The internal evaluation will be 15 marks for day-to-day work in the class that shall be evaluated by the concerned subject teacher based on the reports/ submissions prepared in the class. And there shall be two midterm exams in a Semester for a duration of 3 hours each, evenly distributed over the syllabi for 15 marks and the better of the two shall be considered as internal test marks. The sum of day to day evaluation and the internal test marks will be the final sessionals for the subject. End examination will be conducted for 4 hours.

8.3. Eligibility to appear for the Year-end / Semester-end examination:

1. A student shall be eligible to appear for year-end / semester-End examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a year/ semester.
2. Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in first year or each semester may be granted by the College Academic Committee.
3. Shortage of Attendance below 65% in aggregate shall in no case be condoned.
4. Students whose shortage of attendance is not condoned in First year/any semester are not eligible to take their Semester-end examination of that class and their registration shall stand cancelled.
5. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current year/semester, as applicable. The student may seek readmission for the year/ semester when offered next. He will not be allowed to register for the subjects of the semester while he is in detention. A student detained due to shortage of attendance, will have to repeat that semester when offered next.
6. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

8.4. **Evaluation**: Following procedure governs the evaluation.

8.4.1. Marks for components evaluated internally by the faculty should be submitted to the Controller of Examinations one week before the commencement of the semester-end examinations. The marks for the internal evaluation components will be added to the external evaluation marks secured in the year/semester-end examinations, to arrive at total marks for any subject in that year/semester.

8.4.2. Performance in all the courses is tabulated course-wise and will be scrutinized by the Examination Committee and moderation is applied if needed, and course-wise marks lists are finalized. Total marks obtained in each course are converted into letter grades.

8.4.3. Student-wise tabulation is done and student-wise memorandum of grades (Grade Sheet) is generated which is issued to the student.

8.5. **Personal verification / Revaluation / Recounting :**

Students shall be permitted for personal verification/request for recounting/ revaluation of the semester-end examination answer scripts within a stipulated period after payment of prescribed fee.

After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the student shall be intimated the same through a letter or a notice.

8.6. **Supplementary Examination:**

In addition to the regular year-end / semester-end examinations conducted, the College may also schedule and conduct supplementary examinations for all the subjects of other year/ semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

9. **Academic Requirements for promotion/ completion of regular B.Tech Programme of study:**

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/ completion of regular B.Tech Programme of study.

For students admitted into B.Tech. (Regular) programme:

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project, if he secures not less than 40% of marks in the semester-end examination and a minimum of 40% of marks in the sum total of the internal evaluation and semester-end examination taken together. For the seminar he should secure 40% of marks in the internal evaluation.

ii. A student shall be promoted from second year to third year of programme of study only if he fulfils the academic requirement of securing 39 credits from

a. One regular and one supplementary examinations of first year

b. One regular examination of second year first semester

irrespective of whether the candidate appear the semester-end examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year of programme of study only if he fulfils the academic requirements of securing 67 credits from

a. Two regular and two supplementary examinations of first year

b. Two regular and one supplementary examinations of second year first semester

c. One regular and one supplementary examinations of second year second semester

d. One regular examination of third year first semester

irrespective of whether the candidate appear the semester-end examination or not as per the normal course of study and in case of getting detained for want of credits by sections 9(ii) and 9(iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester respectively.

iv A student shall register for all the 220 credits and earn all the 220 credits. Marks obtained in all the 220 credits shall be considered for the award of the class basing on CGPA.

v. A student who fails to earn 220 credits as indicated in the course structure within **eight** academic years from the year of their admission shall forfeit their seat in B.Tech. programme and their admission stands cancelled.

vi. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

For Lateral Entry Students (batches admitted from 2011–2012):

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 40% of marks in the semester-End examination and a minimum of 40% of marks in the sum total of the internal evaluation and semester-end examination taken together. For the seminar he should secure 40% of marks in the internal evaluation.

ii. A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing 42 credits from :

   a. Two regular and one supplementary examinations of II year I semester
   b. One regular and one supplementary examinations of II year II semester
   c. One regular examination of III year I semester.

   irrespective of whether the candidate appear the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

iii. A student shall register for all 170 credits and earn all the 170 credits. Marks obtained in all 170 credits shall be considered for the award of the class basing on CGPA.

iv. A student who fails to earn 170 credits as indicated in the course structure within **six** academic years from the year of their admission shall forfeit their seat in B.Tech. programme and their admission stands cancelled.

v. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of classwork with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

10. Transitory Regulations:

Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of **eight years**, and a lateral entry student within **six years**, for the award of B.Tech. Degree.

11. Grades, Grade Point Average and Cumulative Grade Point Average:

11.1. Grade System: After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted to letter grades on a "**10 point scale**" described below.

Grades conversion and Grade points attached

% of Marks obtained	Grade	Description of Grade	Grade Points (GP)
≥ 95	O+	Extraordinary	10
≥ 90 & < 95	O	Outstanding	9
≥ 80 & < 90	A+	Excellent	8
≥ 70 & < 80	A	Very Good	7
≥ 60 & < 70	B	Good	6
≥ 50 & < 60	C	Fair	5
≥ 40 & < 50	D	Pass	4
Less than 40	F	Fail	0
Not Appeared	N	Absent	0

- **Pass Marks:** A student is declared to have passed theory and/ or laboratory subject, if he secures minimum of 40% marks in external examination, and a minimum of 40% marks in the sum total of internal evaluation and external examination taken together. Otherwise he will be awarded fail grade - **F** in such a course irrespective of internal marks.

  F is considered as a fail grade indicating that the student has to pass the semester-end examination in that course in future and obtain a grade other than **F** and **N** for clearing this subject.

11.2. Grade Point Average (GPA):

Grade Point Average (GPA) will be calculated as given below on a "10 point scale" as an index of the student's performance at the end of I year/ each semester:

$$GPA = \frac{\sum(C \times GP)}{\sum C}$$

where ***C*** denotes the credits assigned to the courses undertaken in that Year/ semester and ***GP*** denotes the grade points earned by the student in the respective courses.

Note:GPA is calculated for the candidates who passed all the courses in that Year/Semester.

11.3. Cumulative Grade Point Average (CGPA):

At the end of every year / semester, a Cumulative Grade Point Average (CGPA) on a 10 point scale is computed considering all the courses done up to that point as an index of overall performance up to that point as given below:

$$CGPA = \frac{\sum(C \times GP)}{\sum C}$$

where ***C*** denotes the credits assigned to courses undertaken upto the end of the current year/semester and *GP* denotes the grade points earned by the student in the respective courses.

Note: The CGPA is awarded only when the student passes in all the courses prescribed for the programme.

Grade Sheet: A grade sheet (Marks Memorandum) will be issued to each student indicating his performance in all courses registered in that semester/year indicating the GPA.

12. Transcripts: After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee.
Partial transcript will also be issued upto any point of study to a student on request.

13. Award of Degree: The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendations of the Principal of SVEC (Autonomous).

13.1. Eligibility: A student shall be eligible for the award of B.Tech. Degree, if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- Obtained CGPA greater than or equal to 4.0 (Minimum requirement for declaring as passed).
- Has no dues to the College, Hostel, Library etc. and to any other amenities provided by the College.
- No disciplinary action is pending against him.

13.2. Award of Class: Declaration of Class is based on CGPA.

Cumulative Grade Point Average	Class
> = 7.0	First Class with Distinction
> = 6.0 and < 7.0	First Class
> = 5.0 and < 6.0	Second Class
> = 4.0 and < 5.0	Pass Class

14. Additional academic regulations:

i. A student can appear for any number of supplementary examinations till he clears all courses in which he could not clear in the first attempt.

ii. A regular student has to complete all the eligibility requirements within the maximum stipulated period of **eight** years, and a lateral entry student within **six** years.

iii. A grade sheet (marks memorandum) will be issued to the student indicating his performance in all the courses of that year/semester along with the GPA and CGPA.

iv. A transcript containing the performance in all the components required for eligibility for award of the Degree will be issued to the student.

v. Any attempt to impress upon the examiners, faculty and staff or Controller of Examinations, canvassing in any form either for marks or attendance will be treated as malpractice and the student shall be summarily debarred from the College.

vi. Courses like Projects / Mini-Projects / Seminars can be repeated only by re-registering for all the components in that semester.

vii. When a student is absent for any examination (internal or external) he is treated as to have appeared and obtained **zero** marks in that component (course) and grading is done accordingly.

viii. When a component is cancelled as a penalty, he is awarded zero marks in that component.

15. Amendments to regulations:

The Academic Council of Sree Vidyanikethan Engineering College (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

16. General:

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

Note : ***Failure to read and understand the regulations is not an excuse.***

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (yearly pattern)

Common to ECE, EEE, EIE, E Con E , CSE, CSSE and IT

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT1BS04	Mathematical Methods	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics and Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language and Communication skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering and IT workshop	-	-	3	4	25	50	75
	TOTAL	**15**	**6**	**15**	**50**	**305**	**670**	**975**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

REGULATIONS: SVEC-10

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

II B.Tech I Semester

Code	Subject	Periods per week			Credits	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT3BS01	Probability and Statistics	4	1	-	4	30	70	100
10BT30421	Electronic Devices and Circuits	4	1	-	4	30	70	100
10BT30221	Basic Electrical Engineering	4	1	-	4	30	70	100
10BT30422	Digital Logic Design	4	1	-	4	30	70	100
10BT30501	Discrete Mathematical Structures	4	1	-	4	30	70	100
10BT30502	Data Structures	4	1	-	4	30	70	100
10BT30431	Analog and Digital Electronics Lab	-	-	3	2	25	50	75
10BT30511	Data Structures Lab	-	-	3	2	25	50	75
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

II B.Tech II Semester

Code	Subject	Periods per week			Credits	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT3BS02	Environmental Sciences	4	-	-	4	30	70	100
10BT4HS01	Managerial Economics and Principles of Accountancy	4	-	-	4	30	70	100
10BT40501	Computer Architecture and Organization	4	1	-	4	30	70	100
10BT40502	Object Oriented Programming	4	1	-	4	30	70	100
10BT40503	Principles of Programming Languages	4	-	-	4	30	70	100
10BT41221	Computer Graphics and Multi-Media Systems	4	1	-	4	30	70	100
10BT40511	Object Oriented Programming Lab	-	-	3	2	25	50	75
10BT41231	Computer Graphics and Multimedia Systems Lab	-	-	3	2	25	50	75
10BT40512	Programming skills (Audit Course)	-	3	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III B.Tech I Semester

Code	Subject	Periods per week			Credits	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT50501	Design and Analysis of Algorithms	4	1	-	4	30	70	100
10BT61202	Computer Networks	4	-	-	4	30	70	100
10BT50502	Microprocessors and Interfacing	4	1	-	4	30	70	100
10BT50503	Database Management Systems	4	1	-	4	30	70	100
10BT51201	Software Engineering	4	-	-	4	30	70	100
10BT50504	Operating Systems	4	-	-	4	30	70	100
10BT50511	Microprocessors and Interfacing Lab	-	-	3	2	25	50	75
10BT50512	Database Management systems Lab	-	-	3	2	25	50	75
10BT4HS02	Advanced English Communication Skills (Audit Course)	-	3	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III B.Tech II Semester

Code	Subject	Periods per week			Credits	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT60501	Theory of computation	4	1	-	4	30	70	100
10BT60502	UNIX Programming	4	-	-	4	30	70	100
10BT60503	Data Warehousing and Data Mining	4	1	-	4	30	70	100
10BT61201	Object Oriented Analysis and Design	4	-	-	4	30	70	100
10BT60504	Distributed Computing	4	-	-	4	30	70	100
10BT71204	Cryptography and Network Security	4	1	-	4	30	70	100
10BT61211	Object Oriented Analysis and Design Lab	-	-	3	2	25	50	75
10BT60511	UNIX Programming Lab	-	-	3	2	25	50	75
10BT60512	Seminar	-	-	-	2	75	-	75
10BT60513	Knowledge Engineering Lab (Audit Course)	-	3	-	-	-	-	-
	TOTAL	24	6	6	30	305	520	825

IV B.Tech I Semester

Code	Subject	Periods per week			Credits	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT71201	Web Programming	4	1	-	4	30	70	100
10BT70501	Principles of Compiler Design	4	1	-	4	30	70	100
10BT70502	Software Testing Techniques	4	-	-	4	30	70	100
10BT71501	Network Programming	4	1	-	4	30	70	100
10BT71208 10BT70503 10BT70504 10BT62301 10BT71221	**Elective- I** 1. Software Project Management 2. Real Time System Design and Analysis 3. Parallel Processing 4. Bio-Informatics 5. Web Mining	4	-	-	4	30	70	100
10BT70505 10BT70506 10BT71222 10BT70507 10BT70508	**Elective- II** 1. Soft Computing 2. Embedded Systems 3. Software Architecture 4. Pattern Recognition and Image Processing 5. Mainframe Systems	4	-	-	4	30	70	100
10BT70511	Software Testing Techniques Lab	-	-	3	2	25	50	75
10BT71211	Web Programming Lab	-	-	3	2	25	50	75
10BT70512	Mini Project	-	-	-	2	25	50	75
10BT7HS01	Professional Ethics (Audit Course)	-	3	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**30**	**255**	**570**	**825**

IV B.Tech II Semester

Code	Subject	Periods per week			Credits	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
10BT80501 10BT71202 10BT80502 10BT81221 10BT80503	**Elective – III** 1. Computational Intelligence 2. Mobile Computing 3. Human Computer Interaction 4. Adhoc Wireless Networks 5. Enterprise Applications	4	-	-	4	30	70	100
10BT81222 10BT71504 10BT80504 10BT4EC01 10BT80505	**Elective – IV** 1. High Speed Networks 2. Network Management 3. Cloud Computing 4. Optimization Techniques 5. C # and .Net Framework	4	-	-	4	30	70	100
10BT80511	Comprehensive viva	-	-	-	2	100	-	100
10BT80512	Project	-	-	12	12	75	150	225
	TOTAL	**12**	**-**	**12**	**26**	**265**	**360**	**625**

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1BS04: MATHEMATICAL METHODS

(Common to CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT–I

Matrices and Linear System of Equations : Rank of a matrix, echelon form, normal form, inverse of a matrix by normal form. Homogenous and non-homogenous linear systems, consistency and solutions of linear system of equations. Direct methods, Gauss elimination method, Gauss Siedel, Gauss Jordan method, factorization method.

UNIT-II

Eigen Values and Eigen Vectors : Definitions, evaluation of eigen values, eigen vectors and properties. Cayley Hamilton theorem (without proof), inverse and powers of a matrix by Cayley Hamilton theorem, diagonalization of a matrix, quadratic forms and reduction to its normal form (problems dealing with distinct eigen values only).

UNIT-III

Algebraic, Transcendental Equations and Curve Fitting: Solutions of algebraic and transcendental equations by bisection method, false position method, Newton-Raphson's method, iterative method. Curve fitting by the principle of least squares, fitting of a straight line, parabola, exponential and power curves.

UNIT-IV

Interpolation: Interpolation, forward difference operator, backward difference operator, central difference operator, relationship between operators, Newton's forward formula, Newton's backward formula, Gauss forward formula, Gauss backward formula, Lagranges interpolation formula.

UNIT-V

Numerical Differentiation and Integration: Numerical values of derivatives using Newton's forward formula, Newton's backward formula.

Numerical Integration: Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule.

UNIT-VI

Numerical Solutions of Ordinary Differential Equations: Numerical solutions of ordinary differential equations using Taylor series, Euler's method, modified Euler's method, Runge–Kutta method (2^{nd} and 4^{th} orders only), Milne's predictor corrector method.

UNIT-VII

Z – Transformations: Z–transforms, inverse Z–transform, properties, damping rule, shifting rule, initial and final value theorems. Convolution theorem, solution of difference equations by Z–transforms.

UNIT-VIII

Fourier Series and Fourier Transforms: Definition, Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd function, half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, properties, inverse transform, finite Fourier transforms.

TEXTBOOK:

Mathematical Methods, T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, S.Chand and Company, 5^{th} edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36^{th} Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley and Sons, Inc., 8^{th} Edition
3. *Introductory methods of Numerical Analysis ,* S.S.Sastry, Prentice Hall of India, 3^{rd} Edition
4. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3^{rd} Edition

B.Tech. I Year

10BT1EC01: PROBLEM SOLVING AND COMPUTER PROGRAMMING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | $x^2 + y^2$| + $\sqrt{}$2xy
iii) $x^5 + 10\ x^4 + 8\ x^3 + 4\ x + 2$
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS01: PROBABILITY AND STATISTICS

L	T	P	C
4	1	-	4

UNIT - I: PROBABILITY & MATHEMATICAL EXPECTATIONS

Introduction to probability: Definition of Random Experiment, Events and Sample space, Definition of probability, Addition and Multiplication theorems, Conditional probability, Baye's Theorem, Simple Problems on Baye's theorem.

Random Variables: Discrete and Continuous random variables, Distribution function of random variable, Properties, Probability mass function, Probability density function, Mathematical expectation, Properties of Mathematical expectations, Mean and Variance.

UNIT - II: PROBABILITY DISTRIBUTIONS

Discrete Distributions: Binomial Distribution, Mean and Standard Deviations of Binomial Distribution, Poisson distribution, Mean and Standard Deviations of Poisson Distribution, Applications.

Continuous Probability Distributions: Uniform Distribution, Exponential Distribution, Normal Distribution, Properties of Normal Distribution, Importance of Normal Distribution, Area properties of Normal curve.

UNIT-III: CORRELATION AND REGRESSION

Correlation: Definition, Measures of correlation, Correlation for Bivariate Distribution, Rank correlation coefficients.

Regression: Simple linear regression, regression lines and properties.

UNIT-IV: SAMPLING DISTRIBUTIONS

Population and Sample, Parameter and Statistic, Sampling Distribution of Statistic, Standard Error of Statistic, Null and Alternative Hypothesis, Type I and II errors, Level of Significance, Critical region, Degrees of freedom.

UNIT-V: LARGE SAMPLES TEST OF SIGNIFICANCE

Test of Significance for Single Proportion, Test of Significance for Difference of Proportions, Test of Significance for a Single Mean, Test of Significance for Difference of Means and Test of Significance for Difference of standard deviations.

UNIT - VI: **SMALL SAMPLES TEST OF SIGNIFICANCE**

Student's t-test, F-test for equality of population variance, Chi-square Test for Goodness of Test, contingency table, Chi-square Test for Independence of Attributes.

UNIT - VII : Statistical Quality Control

Introduction, Advantages and limitations of statistical quality control, Control charts, Specification limits, $\overline{X}$, R, np and c charts.

UNIT - VIII: QUEUING THEORY:

Queuing Theory, Pure Birth and Death Process, M/M/1 Model, Problems.

TEXT BOOKS:

1. T.K.V. Iyengar, B. Krishna Gandhi and Others, *Probability and Statistics*, S. Chand & Company, 3 ed, 2011.
2. Shahnaz Bathul, *A text book of Probability and Statistics*, 2 ed, Ridge Publications.
3. Kandaswamy & Thilagavathy, *Probability Statistics & Queuing Theory*, 2 ed, S.Chand, New Delhi.

REFERENCE BOOKS:

1. Miller and John E. Freund's, *Probability and Statistics for Engineers*, Pearson Education, 4 ed, 2009.
2. Ronald E. Walpole, *Probability & Statistics for Engineers & Scientists*, Pearson Education India, 2 ed, 2002.
3. S.C.Gupta and V.K.Kapoor, *Fundamentals of Mathematical Statistics*, Sutan and Chand, New Delhi, 2004.
4. S.C.Gupta and V.K.Kapoor, *Fundamentals of Applied Statistics*, Sultan and Chand, New Delhi, 1998.

II B.Tech. I Semester

10BT30421: ELECTRONIC DEVICES AND CIRCUITS

L	T	P	C
4	1	-	4

UNIT-I: PN JUNCTION DIODE

PN Junction Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical, Static and Dynamic Resistances, Diode Equivalent circuits, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

UNIT-II: RECTIFIERS AND FILTERS

PN Junction as a Rectifier, Halfwave rectifier, ripple factor, fullwave rectifier, Bridge Rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, pi-section filter, Use of Zener Diode as a Regulator.

UNIT-III: BIPOLAR JUNCTION TRANSISTOR (BJT)

Transistor construction, BJT Operation, BJT Symbol, Transistor as an Amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in CB, CE and CC Configurations, BJT specifications.

UNIT-IV: TRANSISTOR BIASING AND STABILIZATION

Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in VBE and b.

UNIT-V: BJT AMPLIFIERS

BJT Hybrid Modeling for CB, CE and CC Configurations, Determination of h-Parameters from Transistor Characteristics, Comparison of CB, CE and CC configurations, Simplified Hybrid Model.

UNIT-VI: FIELD EFFECT TRANSISTOR

Junction Field Effect Transistor (Construction, Principle of Operation, Symbol) - Pinch-Off Voltage - Volt-Ampere Characteristics, MOSFET Characteristics in Enhancement and Depletion Modes, Small Signal Model of JFET & MOSFET.

Field Effect Transistor Amplifiers: Common Source, and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, Comparison between BJT and FET.

UNIT-VII: FEEDBACK AMPLIFIERS AND OSCILLATORS (Qualitative treatment)

Feedback Concepts, Types of Feedback Circuits (block diagram representation), General characteristics of negative feedback amplifier, Effect of Feedback on Amplifier characteristics. Barkhausen criterion, Hartley & Colpitts oscillators, Phase Shift Oscillators and Crystal Oscillator.

UNIT-VIII: SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR) and applications.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits,* 1991 Edition, TMH, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits*, 9 ed, PHI, 2006.
3. David A. Bell, *Electronic Devices and Circuits*, 5 ed, Oxford University press, 2008.

REFERENCE BOOKS:

1. J. Millman and Christos C. Halkias, *Integrated electronics*, 1 ed, TMH, 2004.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2 ed, BSP, 2005.
3. Rober T. Paynter, *Introduction to Electronic Devices and Circuits*, 6 ed, Pearson Education.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2 ed, TMH, 2008.

II B.Tech. I Semester

10BT30421: BASIC ELECTRICAL ENGINEERING

L	T	P	C
4	1	-	4

UNIT–I: INTRODUCTION TO ELECTRICAL ENGINEERING

Essence of electricity - Basic circuit components - Basic definitions: Electric field - Electric Current - Potential and potential difference – EMF - electric power - Ohm's law - resistive networks - Inductive networks - capacitive networks - Kirchoff's laws - series parallel circuits - star delta and delta star transformations - fuses - earthing.

UNIT–II: NETWORK ANALYSIS

Basic definitions: Node – Path – Loop - Branch - Nodal analysis– Mesh analysis- Source Transformation Technique –Problems.

Network Theorems: Superposition -Thevenin's - Maximum Power Transfer Theorems.

UNIT-III: ALTERNATING QUANTITIES

Principle of AC voltages - wave forms and basic definitions - RMS and average values of alternating currents and voltage - form factor and Peak factor - phasor representation of alternating quantities - the J operator and phasor algebra - analysis of AC circuits with single basic network element - single phase series and parallel RLC circuits - power factor.

UNIT-IV: THREE PHASE CIRCUITS

Introduction – polyphase systems – advantages – star and delta connection – voltages and currents in balanced star and delta connections – numerical problems – advantages of star and delta connections.

UNIT-V: DIRECT CURRENT MACHINES

Constructional details of a DC machine - principle of operation of a DC generator - types of DC generators - emf equation of a generator– Applications.

DC motors - Principle of operation - types of DC motors - Torque equation - losses and efficiency-Applications.

UNIT-VI: ALTERNATING CURRENT MACHINES

Transformers - principle of operation - constructional details - losses and efficiency - regulation of transformer - testing of Transformers: OC and SC test- Simple problems.

Three phase Induction motors: Constructional details- principle of operation – slip - rotor frequency.

UNIT–VII: SPECIAL MACHINES

Single phase induction motors - Principle of operation - Shaded pole motors – Capacitor motors - AC servomotor - AC tachometers – Synchros - Stepper Motors – Characteristics - voltage stabilizers, uninterruptible power supply (UPS).

UNIT-VIII: BASIC MEASURING INSTRUMENTS

Introduction - classification of instruments - operating principles - essential features of measuring instruments - permanent magnet moving coil (PMMC) and moving iron instruments (voltmeters and ammeters)- Digital multimeters.

TEXT BOOKS:

1. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*, Oxford University press. 2009.
2. BL Theraja & AK Theraja, *A text book of electrical technology in SI units*, vol:2, 2010.

REFERENCE BOOKS:

1. D.P. Kothari and I.J. Nagrath, *Theory and problems of Basic Electrical Engineering*, Prentice Hall of India, 2009.
2. V.K. Mehta, Rohit Mehta, principles of electrical engineering, S. Chand & Company Ltd., 2006
3. V.K. Mehta, Rohit Mehta, *Principles of power systems*, S. Chand & Company Ltd., 2006.
4. M.S. Naidu and S. Kamakshaiah, *Basic Electrical Engineering*, Tata McGraw Hill Publications Ltd, 2009.

II B.Tech. I Semester

10BT30422: DIGITAL LOGIC DESIGN

L	T	P	C
4	1	-	4

UNIT-I: BINARY SYSTEMS

Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

UNIT-II: BOOLEAN ALGEBRA AND LOGIC GATES

Basic Definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, Other logic operations, Digital logic gates, Integrated circuits.

UNIT-III: GATE – LEVEL MINIMIZATION

The k-map method - Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function, Hardware Description language (HDL).

UNIT-IV: COMBINATIONAL LOGIC

Combinational Circuits, Analysis procedure, Design procedure, Binary Adder-Subtractor , Decimal Adder, Binary multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

UNIT-V: SYNCHRONOUS SEQUENTIAL LOGIC

Sequential circuits, Latches, Flip-Flops, Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure.

UNIT-VI: REGISTERS AND COUNTERS

Registers, shift Registers, Ripple counters, Synchronous counters, Other counters, HDL for Registers and counters.

UNIT-VII: MEMORY AND PROGRAMMABLE LOGIC

Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-only memory, Programmable logic Array, programmable Array logic, Sequential Programmable Devices.

UNIT-VIII: ASYNCHRONOUS SEQUENTIAL LOGIC

Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race- Free State Assignment Hazards, Design Example.

TEXT BOOKS:

1. M. Morris Mano, *Digital Design,* 3 ed, Pearson Education/PHI, 1999.
2. Roth, *Fundamentals of Logic Design*, 5 ed, Thomson, 2004.

REFERENCE BOOKS:

1. Zvi. Kohavi, *Switching and Finite Automata Theory*, Tata McGraw Hill, 2004.
2. C.V.S. Rao, *Switching and Logic Design*, 3 ed, Pearson Education, 2009.
3. Donald D.Givone, *Digital Principles and Design*, Tata McGraw Hill, 2002.
4. M. Rafiquzzaman, *Fundamentals of Digital Logic and Micro Computer Design*, 5 ed, John Wiley, 2005.

II B.Tech. I Semester

10BT30501:DISCRETE MATHEMATICAL STRUCTURES

L	T	P	C
4	1	-	4

UNIT-I: MATHEMATICAL LOGIC

Statements and notations, Connectives, Well formed formulae, Truth Tables, Tautology, Equivalence of formulae, Normal forms.

UNIT-II: PREDICATES

Predicate Calculus, Free & Bound variables, Rules of inference, Consistency, Proof of contradiction and Automatic Theorem Proving.

UNIT-III: RELATIONS AND FUNCTIONS

Relations: Properties of binary relations, Equivalence relations, Compatibility relations Partial ordering relations, Hasse diagram and related applications.

Functions: Inverse Functions, Composition of functions, Recursive functions, Lattice and its Properties.

UNIT-IV: ALGEBRAIC STRUCTURES

Algebraic System Examples and General Properties, Semi Groups and Monoids, Groups, Subgroups, Homomorphism and Isomorphism.

UNIT-V: MATHEMATICAL REASONING

Methods of Proof, Mathematical Induction.

Counting: Basics of counting, The Inclusion- Exclusion Principle, The Pigeon hole principle, Permutations & Combinations, Generalized Permutations and Combinations.

UNIT-VI: RECURRENCE RELATIONS

Generating Functions of Sequences, Calculating coefficients of Generating function, Recurrence relation, solving recurrence relations by substitution and Generating functions, Methods of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relation.

UNIT-VII: GRAPHS

Introduction to Graphs, Types of Graphs, Graph basic terminology and Special types of simple graphs, Representation of Graphs and graph Isomorphism, Euler Paths and Circuits, Hamiltonian Paths and Circuits, Planar Graphs, Euler's Formula and Graph Coloring, 4-color theorem, 5-color theorem.

UNIT-VIII: GRAPH THEORY AND ITS APPLICATIONS

Introduction to Trees, Properties of Trees, Applications of Trees, Spanning Trees, Counting trees, Depth-First Search, Breadth-First Search, Minimum Spanning Trees, Kruskal's Algorithm and Prim's Algorithm.

TEXT BOOKS:

1. J.P. Trembly and R. Manohar, *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, 1997.
2. Kenneth H. Rosen, *Discrete Mathematics and its Applications*, 6 ed, Tata McGraw Hill, 2007.

REFERENCE BOOKS:

1. Joe L.Mott and Abraham Kandel, *Discrete Mathematics for Computer Scientists and Mathematicians*, 2 ed, Prentice Hall of India Private Limited, 2004.
2. C.L. Liu and D.P. Mohapatra, *Elements of Discrete Mathematics*, 3 ed, McGraw Hill, 2008.
3. Ralph P. Grimaldi and B.V.Ramana, *Discrete and Combinatorial Mathematics- An Applied Introduction*, 5 ed, Pearson Education, 2006.
4. D.S Mallik and M.K Sen, *Discrete Mathematical Structures: Theory and Applications*, Course Technology, 2004.

II B.Tech. I Semester

10BT30502: DATA STRUCTURES

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO DATA STRUCTURES

Definition, Classification, The Abstract Data Type (ADT), model for ADT, ADT implementation, Generic code for ADTs

Sorting: Sort concepts, Merge sort, Shell sort, Quick sort, Heap sort. Searching: Sequential search, variations on sequential search, Binary search, Fibonacci search.

UNIT-II: GENERAL LINEAR LISTS

Singly linked list, Basic Operations, Implementation, List ADT, Circularly linked lists, Doubly linked lists, Multi linked lists.

UNIT-III: STACKS AND QUEUES

Basic stack operations, Stack linked list, implementation, Stack ADT, Applications: Reversing data, Convert Decimal to binary, Postponement.

Queues: Queue operations, Queue linked list design, Queue ADT, Applications: Categorizing data, Queue simulations.

UNIT-IV: NON LINEAR LISTS

Basic tree concepts, Binary trees: properties, traversals, expression trees.

Binary search trees: Basic concepts, Operations, Binary Search Tree ADT, Threaded trees.

UNIT- V: AVL TREES

Basic Concepts, Balance Factor, implementation, ADT, Algorithms, And Applications: Count words.

Heaps: Basic Concepts, Implementation, ADT, Heap Application.

UNIT- VI: MULTIWAY TREES

M-way search trees, B-trees: Implementation- Insertion, Deletion, Balance, Combine, Traversal, Search, B-tree ADT, Simplified B-trees, lexical search trees.

UNIT-VII: GRAPHS

Basic Operation, Review of traversals- Breadth first traversal, Depth first traversal, Graph storage structures, Graph ADT, Networks: Minimum spanning trees, Shortest path algorithm.

UNIT-VIII: HASH TABLES

Introduction, Hash Table structure, Hash functions, Linear open Addressing, Chaining, Applications.

File Organizations: Introduction, Files, Keys, Basic File Operations, Heap Organization, Sequential File Organization, Indexed Sequential File Organization, Direct File Organization.

TEXT BOOKS:

1. Richard F.Gilberg , Behrouz A.Forouzan, *Data Structures- A Pseudocode Approach with C*, 2 ed, CengageLearning, 2007.
2. G.A.V. Pai, *Data Structures and Algorithms*, Tata McGraw Hill, 2009.

REFERENCE BOOKS:

1. J. Tremblay, P. Sorensen, *An introduction to data structures with Applications*, 2 ed, Tata McGraw-Hill International Editions, 1984.
2. M. Weiss, *Data Structures and Algorithm Analysis in C++*, Pearson Education, 2 ed, 2002.
3. E. Horowitz, S. Sahni, D. Mehta Galgotia, *Fundamentals of Data Structures in C++*, Book Source, New Delhi, 1995.
4. Y. Langsam, M. Augenstin and A. Tannenbaum, *Data Structures using C and C++*, 2 ed, Prentice Hall of India, 2002.
5. A. Drozdek, *Data Structures in C++*, 2 ed, Thomson Brookes/ COLE Books, 2002.

II B.Tech. I Semester

10BT30431:**ANALOG AND DIGITAL ELECTRONICS LAB**

L	T	P	C
-	-	3	2

PART A: **ELECTRONIC WORKSHOP PRACTICE** (Only for Viva-Voce)

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards. Identification, Specifications and Testing of Active Devices: Diodes, BJTs, Low-power JFETs, MOSFETs, LEDs, LCDs, SCR, UJT, Linear and Digital ICs.

PART B: **Analog Devices and Circuits** (Minimum seven experiments to be conducted)

1. PN Junction and Zener diodes characteristics
2. Ripple Factor and Load Regulations of Rectifier with and without filters
   (Fullwave or Halfwave)
3. Input and Output characteristics of Transistor in CE configuration
4. Drain and Transfer Characteristics of JFET
5. Gain and Frequency response of CE Amplifier
6. Gain and Frequency response of Feedback Amplifier (Voltage series or current series)
7. Frequency of oscillations of Hartley and Colpitts Oscillator
8. UJT relaxation oscillator
9. SCR characteristics

PART C: **Digital Circuits**

Realization of:

1. Flip Flops using Logic Gates
2. Two Problems on Combinational Circuits
3. Asynchronous Counter
4. Synchronous Counter

Demonstration of:

VHDL Programme

II B.Tech. I Semester

10BT30511: **DATA STRUCTURES LAB**

L	T	P	C
-	-	3	2

1. a. Implement Quick sort algorithm on the list L={ 67, 78, 34, 11, 99, 42, 56, 23}and display the output list at the end of each pass.
   b. Implement Merge sort algorithm on the lists L1={123, 678, 345, 225, 890, 650,111}, L2= { 654, 789, 912, 144, 255, 666 }.

2 a. Implement Heap sort for the list L= {H, V, A, T, L, M, K, U}.
   b. Implement Heap sort for the list L of 1 (a).

3. Implement binary search and Fibonacci search algorithms on an ordered list L={2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18, 19,20} Undertake search for the elements in the list { 3, 18,1,25}. Compare the number of keys comparisons made during the searches.

4. Write a program to implement the following operations on singly linked list.
   i) Creation ii) Insertion iii) Deletion vi) Display

5. Write a menu driven program which will maintain a list of car models, their price, name of the manufacturer, engine capacity etc., as a doubly linked list. The menu should make provisions for inserting information pertaining to new car models, delete obsolete models, update data such as price besides answering queries such as listing all car models with in a price range specified by the client and listing all details given a car model.

6. Write C programs to implement the following using an array.
   i) Stack ADT ii) Queue ADT

7. Write C programs to implement the following using a singly linked list.
   i) Stack ADT ii) Queue ADT

8. Write a C program to perform the following operations:
   i) Insert an element into a binary search tree.
   ii) Delete an element from a binary search tree.
   iii) Search for a key element in a binary search tree.

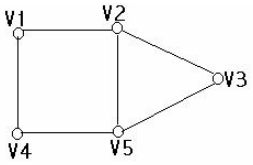
9. Write C program that use recursive functions to traverse the given binary tree in
   i) Preorder ii) Inorder iii) Postorder (Non recursive)

10. Write a C program to perform the following operation
    i) Insertion into an AVL - tree
    ii) Deletion from an AVL – tree

11. Write a C program to perform the following operations
    i) Insertion into a B-tree
    ii) Deletion from a B-tree

12. Write C programs for the implementation of BFS(Breadth First Search) and DFS(depth First Search) for a given adjacency matrix.

    Adjacency Matrix for a Simple Graph:



	V1	V2	V3	V4	V5
V1	0	1	0	1	0
V2	1	0	1	0	1
V3	0	1	0	0	1
V4	1	0	0	0	1
V5	0	1	1	1	0

From the chart above, the adjacency matrix for the graph G is:

0	1	0	1	0
1	0	1	0	1
0	1	0	0	1
1	0	0	0	1
0	1	1	1	0

13. a. Implement a hash table using an array data structure. Design functions to handle overflows using i) linear probing ii) quadratic probing iii) rehashing for a set of keys.

b. Implement a hash table for a given set of keys using chaining method of handling overflows. Maintain the chains in the ascending order of keys. Design a menu driven front end to perform the insert, delete, and search operations on the hash table.

TEXT BOOKS:

1. Richard F.Gilberg, Behrouz A.Forouzan, *Data Structures- A pseudocode Approach with C*, 2 ed, CengageLearning, 2007.
2. G.A.V. Pai, *Data Structures and Algorithms*, Tata McGraw Hill, 2009.

REFERENCE BOOKS:

1. J. Tremblay, P. Sorensen, *An introduction to data structures with Applications*, 2 ed, Tata McGraw-Hill International Editions, 1984.
2. M. Weiss, Data Structures and Algorithm Analysis in C++, 2 ed, Pearson Education, 2002.
3. E. Horowitz, S. Sahni, D. Mehta Galgotia, *Fundamentals of Data Structures in C++*, Book Source, New Delhi, 1995.
4. Y. Langsam, M. Augenstin and A. Tannenbaum, *Data Structures using C and C++*, 2 ed, Prentice Hall of India, 2002.
5. A. Drozdek, *Data Structures in C++*, 2 ed, Thomson Brookes/ COLE Books.

II B.Tech. II Semester

10BT3BS02: ENVIRONMENTAL SCIENCES

L	T	P	C
4	-	-	4

UNIT - I: INTRODUCTION TO ENVIRONMENTAL SCIENCES

Definition and concept of the term environment – Various components of environment – Abiotic and biotic – Atmosphere – Hydrosphere – Lithosphere – Biosphere – Inter relationships – Need for public awareness – Role of important national and international individuals and organizations in promoting environmentalism.

UNIT - II: NATURAL RESOURCES, CONSERVATION AND MANAGEMENT

Renewable and Non renewable resources and associated problems– Forests: Deforestation, Causes, effects and remedies – Effects of mining, dams and river valley projects – case studies; Water resources: Water use and over exploitation – Conflicts over water – Large dams – benefits and problems; Food resources: World food problems – Adverse effects of modern agriculture – Fertilizer and pesticide problems; Land resources: Land degradation– Land slides- Soil erosion – desertification- water logging – salinity – Causes, effects and remedies; Mineral resources: Mining – Adverse effects; Energy resources: Growing needs – Renewable and Non renewable resources – Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear energy, Hydrogen fuel and Solar energy - Impact on environment - Sustainable life styles.

UNIT - III: ECOLOGY AND ECOSYSTEMS

Definitions and concepts – Characteristics of ecosystem – Structural and functional features – Producers, consumers and decomposers and food webs – Types of ecosystems – Forests grassland, desert, crop land, pond, lake, river and marine ecosystems – Energy flow in the ecosystem – Ecological pyramids – Ecological successions.

UNIT - IV: BIO DIVERSITY, CONSERVATION AND MANAGEMENT

Introduction – Definition and concept of biodiversity – Value of biodiversity – Role of biodiversity in addressing new millennium challenges – Global, national biodiversity – Hot spots of biodiversity– Threats to biodiversity – Man and wild life conflicts – Remedial measures – Endemic, endangered and extinct species – In-situ and ex-situ conservation of biodiversity.

UNIT - V: ENVIRONMENTAL POLLUTION AND CONTROL

Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution – Solid waste management – Causes, effects, control and disposal methods – Role of individuals in the prevention of pollution – Hazards and disaster management – Floods – Earthquakes – Tsunamis – Cyclones – Land slides – Case studies.

UNIT - VI: SOCIAL ISSUES AND THE ENVIRONMENT

Concept of sustainable development – Methods of rainwater harvesting – Watershed management – Waste land reclamation – Green cover – Green power – Green technology – Resettlement and rehabilitation of people and related problems – Case studies – Issues and possible solutions - Greenhouse effect and global warming – Carbon credits – Acid rains – Ozone layer depletion – Causes, effects and remedies – Consumerism and waste production– Environment protection acts – Air act – Water act – Forest conservation act – Wild life protection act – Issues involved in the enforcement.

UNIT - VII

HUMAN POPULATION AND ENVIRONMENT

Population growth and its impact on environment – Environmental ethics – Family welfare programmes – Human health: T.B., Cancer, HIV/AIDS – Causes, effects and remedies – Occupational health hazards – Human rights – Important international protocols and conventions on environment.

UNIT - VIII

FIELD WORK/ENVIRONMENTALIST'S DIARY/ASSIGNMENTS/ SEMINARS

TEXT BOOKS:

1. Erach Barucha, *Environmental Studies*, 1 ed, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies,* 3 ed, New Age International Publishers, 2011.

REFERENCE BOOKS:

1. Desh wal, *Environmental Studies,* 2 ed, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1 ed, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies,* 2 ed, Tata McGraw-Hill, New Delhi, 2010.

II B.Tech. II Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

L	T	P	C
4	-	-	4

UNIT-I : INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition, Nature and scope of managerial economics. Demand Analysis: Determinants of demand – Demand Function-Law of demand and its exceptions. Elasticity of demand. Types, Measurement and significance of Elasticity of demand. Demand forecasting and methods of demand forecasting.

UNIT-II : THEORY OF PRODUCTION AND COST ANALYSIS.

Production Function: isoquants and isocosts. Input – output relationship. Law of returns, internal and external economies of scale. cost concepts: opportunity Vs out lay costs, Fixed Vs Variable costs, Explicit Vs implicit costs, out of pocket Vs inputted costs. Break Even Analysis (BEA), Determination of break even point (Simple problems).

UNIT-III : INTRODUCTION TO MARKETS AND PRICING.

Market Structure:Types of Markets. Features of Perfect competition. Monopoly and Monopolistic competition. Price and Output determination in Perfect competition and Monopoly. Pricing: Objectives and policies of Pricing – Sealed bid pricing, Marginal cost pricing, Cost plus pricing, Going rate pricing, Limit Pricing, Market Penetration, Market Skimming, Block pricing, Bundling, Peak load pricing, Cross subsidization,Duel Pricing, Administrated pricing.

UNIT-IV : BUSINESS AND NEW ECONOMIC ENVIRONMENT.

Characteristic features of Business, features and evolution of Sole proprietorship, Partnership, Joint stock Company, New Economic policy 1991.

UNIT-V : INTRODUCTION AND PRINCIPLES OF ACCOUNTING

Accountancy: Introduction – Concepts – Conventions – Accounting Principles - Double Entry Book Keeping, Journal, Ledger, Trail Balance (Simple Problems).

UNIT – VI : FINAL ACCOUNTS

Introduction to Final Accounts. Trading Account, Profit and Loss Account, and Balance Sheet with simple adjustments (Simple Problems).

UNIT – VII : CAPITAL AND CAPITAL BUDGETING

Capital: Significance, Types of capital. Capital Budgeting: Nature and scope of capital budgeting. Features and Methods of capital budgeting. Pay Back Period Method, Accounting Rate of Return Method, Internal Rate of Return Method, Net present Value Method and Profitability Index (Simple Problems).

UNIT – VIII : COMPUTERIZATION OF ACCOUNTANCY SYSTEM

Manual Accounting Vs Computerized Accounting – Advantages and Disadvantages of Computerized Accounting – Using Accounting Software. Tally: Tally features – Company Creation – Account Groups– Group Creation – Ledger Creation.

TEXT BOOKS:

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3 ed, Tata MC-Graw Hill, New Delhi, 2007.
2. R. Cauvery, U.K.Sudhanayak, M.Girija and R. Meenakshi, *Managerial Economics,* 1 ed, S. Chand and company, New Delhi, 1997.

REFERENCE BOOKS:

1. Ms. Samba Lalita, *Computer Accounting Lab Work*, 1 ed, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19 ed Sultan Chand and Sons, New Delhi, 2005.
3. H.Craig Petersen and W.Cris Levis, *Managerial Economics*, 4 ed, Pearson, 2009.
4. Lipsy and Chrystel, *Economics,* 4 ed,Oxford University Press, New Delhi, 2008.
5. S.N.Maheswari and S.K.Maheswari, *Financial Accounting,* 4 ed, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting,* 5 ed, Kalyani Publishers, Ludhiana, 2000.

II B.Tech. II Semester

10BT40501: COMPUTER ARCHITECTURE AND ORGANIZATION

L	T	P	C
4	1	-	4

UNIT I: STRUCTURE OF COMPUTERS

Computer Types, Functional Units, Basic Operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputers.

Computer Arithmetic: Review of Representation of Information, Addition and Subtraction, Multiplication and Division Algorithms, Floating-Point Arithmetic Operation, Decimal Arithmetic Unit, Decimal Arithmetic operations.

UNIT II: REGISTER TRANSFER AND MICRO-OPERATIONS

Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit, Instruction Codes, Computer Registers, Computer Instructions, Instruction Cycle, Timing and Control, Memory-Reference Instructions, Input-Output and Interrupt.

Central Processing Unit: Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). Comparison of RISC and CISC.

UNIT III: MICRO-PROGRAMMED CONTROL

Control Memory, Address Sequencing, Micro-program Example, Design of Control Unit, Hardwired Control, Micro-programmed Control, Nanoprogramming.

UNIT IV: PIPELINE AND VECTOR PROCESSING

Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data Path & Control Consideration, Superscalar Operations, Vector Processing, Array Processors.

UNIT V: THE MEMORY SYSTEM

Basic Concepts, Semiconductor RAM, Types of Read-only Memory (ROM), Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage, and Introduction to Redundant Array of Inexpensive Disks (RAID).

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA).

UNIT-VI: INPUT-OUTPUT ORGANIZATION (ADVANCED)

Input-Output Processor (IOP), Serial communication, Introduction to peripheral component Interconnect (PCI) bus, Introduction to Standard Serial Communication Protocols Like RS232, USB, and IEEE1394.

UNIT VII: MULTIPROCESSORS

Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Cache Coherence, Shared Memory Multiprocessors.

UNIT VIII: CASE STUDIES

CISC Architecture-Pentium IV, RISC Architecture-PowerPC.

TEXT BOOKS :

1. M. Moris Mano, *Computer System Architecture*, 3 ed, Pearson/PHI, 2008.
2. William Stallings, *Computer Organization and Architecture*, 6 ed, Pearson/PHI.

REFERENCE BOOKS:

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, *Computer Organization*, 5 ed, McGraw Hill, 2002.
2. Andrew S. Tanenbaum, *Structured Computer Organization*, 4 ed, PHI/Pearson
3. Sivarama P. Dandamudi, *Fundamentals of Computer Organization and Design*, Springer Int. Edition, 2003.
4. John P. Hayes, *Computer Architecture and Organization*, 3 ed, Tata McGraw Hill, 1998.

II B.Tech. II Semester

10BT40502: OBJECT ORIENTED PROGRAMMING

L	T	P	C
4	1	-	4

UNIT-I: OBJECT ORIENTED THINKING

Need for OOP paradigm, OOP concepts, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions. C++ class overview-class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and de-allocation.

UNIT-II: POLYMORPHISM AND INHERITANCE

Function overloading, operator overloading, generic programming-function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, abstract classes, Streams.

UNIT-III: BASICS OF JAVA

History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT-IV: INHERITANCE AND INTERFACES

Inheritance: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

Interfaces: differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-V: PACKAGES AND EXCEPTION HANDLING

Exception handling: Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

UNIT-VI: MULTITHREADING

Differences between multithreading and multitasking, thread life cycle, creating threads, synchronizing threads.

Applets: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets, Graphics class.

UNIT-VII: EVENT HANDLING

Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics, layout manager – boarder, grid, flow, card and grid bag.

UNIT-VIII: SWINGS

Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing – Japplet, JFrame and JComponent, Icons and labels, text fields, The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Robert Lafore, *Waite Group's Object-Oriented Programming in C++*, 3 ed.
2. Herbert Schildt, *Java; The complete reference*, 7 ed, TMH.

REFERENCE BOOKS:

1. Y. Daniel Liang, *Introduction to Java programming*, 6 ed, Pearson Education.
2. Cay.S.Horstmann and Gary Cornell, *Fundamentals*, 7 ed, Core Java 2, Vol.1, Pearson Education.
3. S.B. Lippman, *C++ primer*, 3 ed, Pearson Education ltd.
4. W.Savitch, *Problem solving with C++*, *The OOP*, 4 ed, Pearson education.
5. B. Stroustrup, *The C++ Programming Language*, 3 ed, Pearson Education.

II B.Tech. II Semester

10BT40503: PRINCIPLES OF PROGRAMMING LANGUAGES

L	T	P	C
4	-	-	4

UNIT-I: PRELIMINARY CONCEPTS

Concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms: Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation, Compilation and Virtual Machines, Programming environments, Introduction to Syntax and Semantics.

UNIT-II: DATA TYPES

Introduction, primitive, character, String, user-defined, array, associative arrays, records, set, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT-III: EXPRESSIONS AND STATEMENTS

Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures: Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT-IV: SUBPROGRAMS AND BLOCKS

Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co-routines.

UNIT-V: ABSTRACT DATA TYPES

Abstractions and encapsulation, introductions to data abstraction, design issues, Concept of Object, Inheritance, Derived classes , language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95, Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT-VI: EXCEPTION HANDLING

Exceptions, exception Propagation, Exception handler in Ada, C++ and Java. Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT-VII: FUNCTIONAL PROGRAMMING LANGUAGES

Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages, Database Query Languages(using SQL as Example).

UNIT-VIII: SCRIPTING LANGUAGES

Case Study : Python, PERL,PHP,ABAP – Key concepts ,Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

TEXT BOOKS:

1. Robert W. Sebesta, *Concepts of Programming Languages*, 8 ed, Pearson Education, 2008.
2. D. A. Watt, *Programming Language Design Concepts*, Wiley Dreamtech, RP-2007.

REFERENCE BOOKS:

1. A.B. Tucker, R.E. Noonan, *Programming Languages*, 2 ed, TMH.
2. K.C. Louden, *Programming Languages*, 2 ed, Thomson, 2003.
3. Patric Henry Winston and Paul Horn, *LISP*, 2 ed, Pearson Education.
4. M. Lutz, *Programming Python*, 3 ed, O'Reilly, SPD, RP-2007.

II B.Tech. II Semester

10BT41221: COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and work stations and input devices, graphics standards.

UNIT II : OUTPUT PRIMITIVES

Points and lines, line drawing algorithms, midpoint circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT III : 2-D GEOMETRICAL TRANSFORMS

Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT IV : 2-D VIEWING

The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland–Hodgeman polygon clipping algorithm.

UNIT V : 3-D GEOMETRIC TRANSFORMATIONS

Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces.

UNIT VI: MULTIMEDIA SYSTEMS DESIGN

An Introduction – Multimedia applications – Multimedia System Architecture –Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

UNIT VII: MULTIMEDIA FILE HANDLING

Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – video image and animation – Full motion video – Storage and retrieval Technologies.

UNIT VIII: HYPERMEDIA

Multimedia Authoring & User Interface – Hypermedia messaging- Mobile Messaging– Hypermedia message component – creating Hypermedia message – Integrated multimedia message standards- Integrated Document management – Distributed Multimedia Systems.

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker, *Computer Graphics C Version*, 2 ed, Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, *Multimedia Systems and Design*, 3rd Indian Reprint Edition, PHI Learning.

REFERENCE BOOKS:

1. Judith Jeffcoate, *Multimedia in practice technology and Applications*, PHI, 1998.
2. Foley, Vandam, Feiner, Huges, *Computer Graphics: Principles & Practice*, 2 ed, Pearson Education, 2003.
3. David F Rogers, *Procedural elements for Computer Graphics*, 2 ed, Tata McGraw Hill.
4. Newman and Sproul, *Principles of Interactive Computer Graphics*, 2 ed, TMH.
5. Shalini Govil, Pai, *Principles of Computer Graphics*, Springer, 2005.
6. Steven Harrington, *Computer Graphics*, 2 ed, TMH.

II B.Tech. II Semester

10BT40511: OBJECT ORIENTED PROGRAMMING LAB

L	T	P	C
-	-	3	2

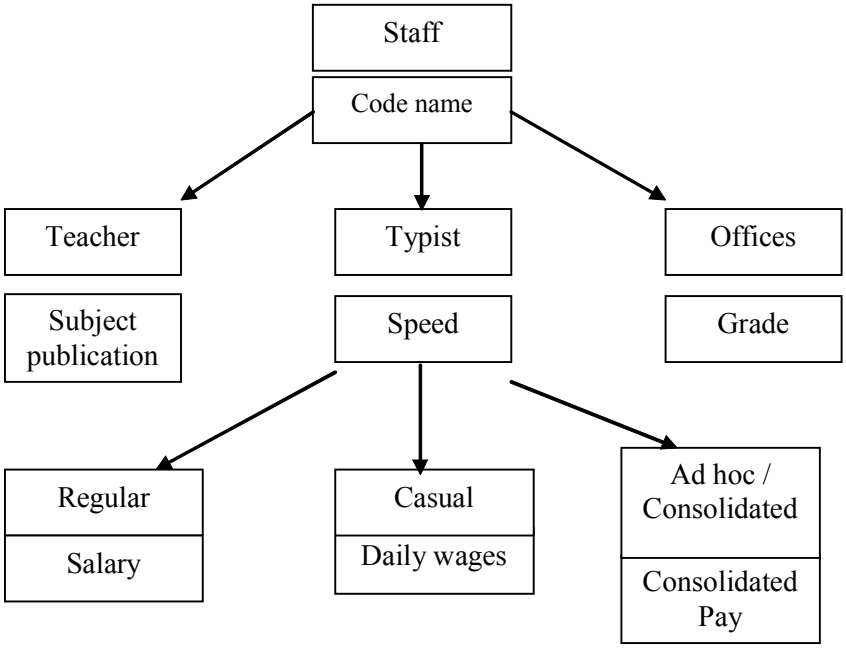
1. a) Write a C++ program that prints Student Name, Roll No., Branch, Marks and display the Total and Division in the following format after reading the necessary input (Use\n \t etc..).

Name	::	********
Roll No	::	********
Branch	::	********
Marks	::	********
Total	::	********
Division	::	********

   b) Write a C++ program to perform complex operations addition, Subtraction, Multiplication and Division using friend function.

2. a) Write a program in C++ to perform the following using the function template concepts.
   a. To read a set of integers
   b. To read a set of floating point numbers
   c. To read a set of double numbers
   Write function for finding average of non-negative numbers and also calculate the deviation of the numbers.
   b) Write a class Fraction that defines methods addition, subtraction, multiplication and division of fractions by overloading basic arithmetic operators.
3. a) Write a C++ program to implement the given hierarchy, using the appropriate methods.

Class relations



Salary – DA, HRA, PF, Dailywages – 200/- per day, Consolidated pay – Fixed Amount

b) Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get data() to initialize base class data members and another member function display area() to compute and display the area of figures. Make display area() as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively, and display the area.

Remember the two values given as input will be treated as length of two sides in the case of rectangles, and as base and height in the case of triangles, and used as follows:

Area of rectangle = x * y

Area of triangle = ½ * x * y

4. a) Create a class called Date that includes three pieces of information as instance variables-a month (type int), a day (type int). Your class should have a constructor that initializes the three values provided are correct.

   Provide set and get method for each instance variable. Provide a method display date that displays the month, day, year separated by forward slashes (/).

   Write a test application named DateTest that demonstrates Class Date's capabilities.

   b) Create a class huge Integer which uses a 40-element array of digits to store integers as large as 40 digits each. Provide Methods: isEqualTo, isNotEqualTo, isGreaterThan, isLessThan, isGreaterThanorEqual and isLessThanorEqualTo.

   Each method returns a boolean value if the relation ship holds true.

5. a) Write a program that reads a line of integers (maximum limit 6 digits), and then displays each integers and sum of all the integers. (Hint: Use StringTokenizer class)

   b) Write a program to do the following

      a) To print a question "Who is inventor of Java"?

      b) To accept the answer

      c) To print out "Good" and then stop, if the answer is correct.

      d) To output the message "try again", if the answer is wrong.

      e) To display the correct answer when the answer is wrong even at the third attempt and stop.

6. a) Assume that a bank maintains two kinds of account for its customers, one called saving account and the other current account.

The savings account provides compound interest and with drawl facilities but no chequebook facility. The current account provides chequebook facility but no interest.

Current account holders should also maintain a minimum balance and if the balance falls below this level a service charge is imposed.

Create a class account that stores customer name, account number and type of account. From this derive the classes Curr_Acct and Sav_Acct to make them more specific to their requirements.

Include the necessary methods in order to achieve the following tasks:

a) Accept deposit from a customer and update the balance
b) Display the balance.
c) Compute and deposit interest.
d) Permit with drawl and update the balance.
e) Check for the minimum balance, impose penalty, if necessary and update the balance.

b) Write an inheritance hierarchy for classes Quadrilateral, Trapezoid, Parallelogram, Rectangle and Square. Use Quadrilateral as the super class of the hierarchy. Make the hierarchy as deep as possible. Specify the instance variables and methods for each class. The private instance variables of Quadrilateral. Write a program that instantiates objects of your classes and outputs the object's area (except Quadrilateral).

7. a) Write a program to illustrate an inner class by creating an anonymous object in the main class.

   b) Design an interface 'Movable Shape' that can be used as a generic mechanism for animating a shape. A movable shape must have two methods: move and draw. Write a 'Animation Panel' class that paints and moves any 'Movable Shape' supply movable rectangle and car shapes.

8. a) Write a package called Math that implements class exactly java.lang.math, with a distinguished set of mathematical functions and also Date manipulation functions.

   b) Implement Stack ADT using Packages.

9. a) Write a program that converts from 24-hour time to 12-hour time. Define an exception class IllegalTimeFormat, if the user enters an illegal time like 11:65 or even gibberish like &&* 68, throw and catch the exception.

   b) Write a program that calls a method that throws an exception of type Arithmetic Exception at a random iteration in a for loop. Catch the Exception in the method and pass the iteration count when the exception occurred to the calling method by using an object of an exception class you define. Add a finally block to the method to output the iteration count when the method exists.

10.a) Write a program that correctly implements producer consumer problem using the concept of inter thread communication.

   b) Write a program that demonstrates time slicing among equal priority threads, show that a lower priority thread's execution is deferred by the time slicing of higher-priority threads.

11.a) Develop an applet that displays a simple message.

   b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked.

12.a) Write a Java program for handling Mouse Events.

   b) Write a Java program for handling Keyboard Events.

13. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

II B.Tech. II Semester

10BT41231: COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS LAB

L	T	P	C
-	-	3	2

Line and Circle Drawing Algorithms:

1. Write a program to implement DDA line drawing algorithm.
2. Write a program to implement Bresenham's line drawing algorithm.
3. Write a program to implement Bresenham's circle drawing algorithm.
4. Write a program to draw an ellipse using Bresenham's algorithm.
5. Write a program to perform various transformations on line, square & rectangle.

2-D Clipping Algorithms:

6. Write a program to implement Cohen Sutherland line clipping algorithm.
7. Write a program to implement Liang-Bersky line clipping algorithm.
8. Write a program to implement Cohen-Sutherland polygon clipping algorithm to clip a polygon with a Pattern.

3-D Algorithms:

9. Write a program to implement 3D Geometrical transformations.
10. Write a program to implement 3D shear transformations.

Multimedia:

11. Write a program to convert a color given in RGB space to it's equivalent CMY color space.
12. Study of various Multimedia file formats:-RTF, MIDI, GIF, JPEG, MPEG, TIFF etc.
13. Write a program to implement JPEG compression scheme for still images.
14. Write a program to perform Pack-bits compression & decompression.

15. Write a short program to create a TIFF file using bitmap segments and text files as the TIFF File components.
16. Write a program to convert a BMP file into either JPEG or GIF file.

TEXT BOOKS:

1. Donald Hearn and M. Pauline Baker, *Computer Graphics C Version*, 2 ed, Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, *Multimedia Systems and Design*, 3 ed, PHI Learning.

REFERENCE BOOKS:

1. Judith Jeffcoate, *Multimedia in practice technology and Applications*, PHI, 1998.
2. Foley, Vandam, Feiner, Huges, *Computer Graphics: Principles & Practice*, 2 ed, Pearson Education, 2003.
3. David F Rogers, *Procedural elements for Computer Graphics*, 2 ed, Tata McGraw Hill.

II B.Tech. II Semester

10BT40512: **PROGRAMMING SKILLS**

(AUDIT COURSE)

L	T	P	C
-	3	-	-

List of Problems:

1 (a) Write a C program that accepts two integer arguments by a reference and perform a swap.

(b) Write a C program to perform the following operations on N X N matrices.

(i) Addition (ii) Subtraction

(iii) Multiplication (iv) Transpose

2 (a) Write function that accepts two arguments an array and its size .it performs a Bubble sort on the array elements. Use the indirection operator '*' instead of the array subscript operator '[ ]'.

(b) Write a function that accepts a string a character as arguments and returns the number of occurrences of the character in the string.

3. (a) Write a function that accepts a string as arguments and return 1 if it is a Palindrome and 0 it is not.

(b) Write a C program which copies one text file to another.

(c) Write a C program to reverse the first N characters of a given text file.

4. Write C program to process student records by using Structures with pointers. The student record consist of name, roll number, age, department, percentage.

5. Write a C++ program that prints the factorial of a given number using a constructor and a destructor member function.

6. Write an object oriented program in C++ to read a number n and print it digit by digit in words using inline member function.

7. Develop an object oriented program in C++ to prepare the mark sheet of an university examination with the following items read from the keyboard.

Name of the student, roll number, subject name, subject code, internal marks, external marks.

Design a base class consisting of the data members such as name of the student, roll number, subject name. The derived class consists of the data members, subject code, internal marks, external marks.

8. Write a program in C++ to perform the following using operator overloading:
   i) area of a circle
   ii) area of rectangle
   iii) area of a triangle
9. Develope a program in C++ to create a library information system containing the following for all the books in the library. Accession number, name of the author, title of the book, year of publication, publisher's name, cost of the book.

   Design a base class with the data members Accession number, name of the author, title of the book. Another base class consists of year of publication, publisher's name. The derived class consists of data member cost of the book. Construct a virtual base class for the Accession number.
10. Write a program in C++ to perform the following using the function template concepts.
    i)to read a set of integers.
    ii)to read a set of floating point numbers.
    iii)to read a set of double numbers individually.
    Find out the average of the nonnegative integers.
11. Write a program in C++ using a class template to read any five parameterized data type such as float and integer and print the average.
12. Write a program to convert a lower case character to an upper case character of a text file.

TEXT BOOKS:

1. Behrouz A. Forouzan and Richard F. Gilberg, *A Structured Programming Approach using C*, 2 ed, Cengage Learning
2. Yashwant Kanetkar, *Pointers in C*, BPB Publications, 2002.
3. W.Savitch, *Problem solving with C++, The OOP*, 4 ed, Pearson education.

III B.Tech. I Semester

10BT50501: DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation-Big (o) notation, Omega notation, Theta notation and Little (o) notation, Recurrences, Probabilistic analysis.

UNIT II: DISJOINT SETS AND GRAPHS (Algorithm and Analysis)

Disjoint set operations, union and find algorithms, Graphs-Breadth First search and Traversal, Depth First Search and Traversal, spanning trees, connected components and biconnected components.

UNIT III: DIVIDE AND CONQUER

General method, Applications-Analysis of Binary search, Quick sort, Merge sort, Strassen's matrix multiplication, Finding the Maxima and Minima.

UNIT IV : GREEDY METHOD

General method, Applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Optimal storage on Tapes.

UNIT V: DYNAMIC PROGRAMMING

General method, Applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design, String Editing.

UNIT VI: BACKTRACKING

General method, applications-n-queen problem, sum of subsets problem, graph colouring, 0/1 knapsack problem, Hamiltonian cycles.

UNIT VII: BRANCH AND BOUND

General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT VIII: NP-HARD AND NP-COMPLETE PROBLEMS

Basic concepts, non-deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem, NP-hard scheduling Problems.

TEXT BOOK:

1. Ellis Horowitz, Satraj Sahni and Rajasekharam, *Fundamentals of Computer Algorithms*, 2 ed, Galgotia publications Pvt. Ltd.

REFERENCE BOOKS:

1. M.T.Goodrich and R. Tomassia, *Algorithm Design: Foundations, Analysis and Internet examples*, John Wiley and sons, 2002.
2. R.C.T.Lee, S.S. Tseng, R.C. Chang and T. Tsai, *Introduction to Design and Analysis of Algorithms A strategic approach*, McGraw Hill, 2006.
3. Allen Weiss, *Data structures and Algorithm Analysis in C++*, 2 ed, Pearson education.
4. Aho, Ullman and Hopcroft, *Design and Analysis of algorithms*, 2 ed, Pearson education.

III B.Tech. I Semester

10BT61202: COMPUTER NETWORKS

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION

Network Applications, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Example Networks: Novell Network, X.25, Internet.

UNIT II: THE PHYSICAL LAYER

Theoretical Basis for communication, Guided Transmission media, Wireless Transmission, The public switched telephone Networks, Mobile telephone system.

UNIT III: THE DATA LINK LAYER

Design Issues, Error detection and correction-CRC, Hamming codes, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols: HDLC, The Data Link Layer in the Internet.

UNIT IV: THE MEDIUM ACCESS SUBLAYER

Channel Allocations problem, Multiple Access protocols: ALOHA, CSMA, CSMA/CD protocols, Collision free protocols, Limited contention protocols, Ethernet, DLL Switching.

UNIT V: THE NETWORK LAYER

Network Layer Design Issues, Routing Algorithms: Shortest path, Flooding, Distance vector, Hierarchical, Broadcast and Multicast, Congestion Control Algorithms, Internetworking, The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, Ipv6 Main Header.

UNIT VI: THE TRANSPORT LAYER

Transport Service, Elements of transport protocol, Internet Transport layer protocols: UDP and TCP.

UNIT VII: THE APPLICATION LAYER

DNS: The Domain name system, Electronic Mail, World Wide Web: Architectural Overview, Dynamic Web Document, HTTP.

UNIT VIII: IEEE STANDARDS AND NETWORK SECURITY

Introduction to IEEE standards, Wi-Fi: 802.11b, Bluetooth: 802.15, 3G: 802.16, 4G: 802.16m, Wi-Max: 802.16a.

Introduction to Network Security: Cryptography - Substitution Techniques, Transposition Techniques.

TEXT BOOK:

1. A.S. Tanenbaum, *Computer Networks*, 4 ed, Pearson Education/ PHI.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, *Data communication and Networking*, Tata McGraw-Hill, 2004
2. Peterson and Davie, *Computer Networks*, 2 ed, Morgan Kaufmann.
3. Kurose, Ross, *Computer Networking*, Pearson Education, 2010.
4. Leon-Garcia and Widjaja, *Communication Networks*, 2 ed TMH.
5. S.Keshay, *An Engg. Approach to Computer Networking*, Addison Wesley, 1997.

III B.Tech. I Semester

10BT50502: MICROPROCESSORS AND INTERFACING

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

An overview of 8085, Architecture of 8086 microprocessor. Register organization. 8086 flag register and functions of 8086 flags. Addressing modes of 8086, Instruction set of 8086.
Assembler directives. Simple programs - Procedures and Macros.

UNIT-II: ASSEMBLY LANGUAGE PROGRAMMING

Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III: ARCHITECTURE OF 8086 & INTERFACING

Pin configuration of 8086-Minimum mode and maximum mode of operation, Timing diagram. Memory interfacing to 8086 (static RAM and EPROM), Need of Direct Memory Access (DMA), DMA data transfer method, Interfacing with 8237/8257.

UNIT-IV: PROGRAMMABLE INTERFACING DEVICES

8255 PPI-various modes of operation and interfacing to 8086, Interfacing keyboard, displays, 8279, stepper motor and actuators, D/A and A/D converter interfacing.

UNIT-V: INTERRUPTS AND PROGRAMMABLE INTERRUPT CONTROLLERS

Interrupt structure of 8086, Interrupt Vector table. Interrupt service routines, Introduction to DOS and BIOS interrupts, 8259 PIC architecture and interfacing cascading of interrupt controller and its importance, Programming with 8259.

UNIT-VI: SERIAL DATA TRANSFER SCHEMES

Asynchronous and synchronous data transfer schemes, 8251 USART architecture and interfacing, TTL to RS232C and RS232C to TTL conversion, Sample programs for serial data transfer.
Introduction to high-speed serial communications standards, USB.

UNIT-VII: ADVANCED MICROPROCESSORS

Introduction to 80286, Salient Features of 80386, Real and Protected Mode, Segmentation and Paging, Salient Features of Pentium, Branch Prediction, Overview of RISC Processors.

UNIT-VIII: 8051 MICROCONTROLLER AND ITS PROGRAMMING

Architecture of microcontroller - 8051 Microcontroller - internal and external memories-counters and timers - synchronous serial communication - asynchronous serial communication-interrupts. Addressing modes of 8051, Instruction set of 8051, Assembly Language Programming examples using 8051.

TEXT BOOKS:

1. A.K. Ray and K.M.Bhurchandi, *Advanced microprocessor and peripherals*, 2 ed, Tata Mc-Graw Hill Edition, 2000.
2. Kenneth J. Ayala, *The 8051 Microcontroller architecture, programming & applications*, 2 ed, Pearson.

REFERENCE BOOKS:

1. Douglas V.Hall, *Microprocessors Interfacing*, 2 ed, 2007, TMH.
2. Walter A. Triebel, Avtar Singh, *The 8088 and 8086 Microprocessors*, 4 ed, PHI, 2003.
3. Liu and GA Gibson, *Micro computer system 8066/8088 family Architecture*, *programming and Design*, 2 ed, PHI.
4. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems*, PHI, 2000.
5. Deshmukh, *Microcontrollers*, Tata McGraw Hill Edition, 2004.

III B.Tech. I Semester

10BT50503: DATABASE MANAGEMENT SYSTEMS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

History of Database Systems, Introduction to DBMS, Database System Applications, Database Systems Versus File Systems, View of Data, Data Models, Database Languages- DDL & DML Commands and Examples of Basic SQL Queries, Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures.

UNIT II: DATABASE DESIGN

Introduction to Database Design and E-R Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the E-R Model, Conceptual Design with the E-R Model, Conceptual Design for Large Enterprises.

UNIT III: THE RELATIONAL MODEL

Introduction to the Relational Model, Integrity Constraints over relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER to Relational, Introduction to Views, Destroying/Altering Tables and Views.

Relational Algebra and Calculus: Preliminaries, Relational Algebra Operators, Relational Calculus – Tuple and Domain Relational Calculus, Expressive Power of Algebra and Calculus.

UNIT IV: SQL: QUERIES, CONSTRAINTS, TRIGGERS

Overview, The form of a Basic SQL Query, Union, Intersect and Except operators, Nested Queries, Aggregate Operators, Null values, Complex Integrity Constraints in SQL, Triggers and Active Databases, Designing Active Databases.(Chapter 5;Sections 5.1-5.9 including subtopics from Text book-1)

UNIT V: SCHEMA REFINEMENT AND NORMAL FORMS

Introduction to Schema Refinement, Functional Dependencies, Reasoning about FDs, Normal Forms – 1NF, 2NF, 3NF, BCNF, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies – 4NF, 5NF, DKNF, Case Studies.

UNIT VI: TRANSACTIONS MANAGEMENT

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability.

UNIT VII: CONCURRENCY CONTROL AND RECOVERY SYSTEM.

Concurrency Control: Lock Based protocols, Time-Stamp Based Protocols, Validation based Protocols, Multiple Granularity, and Deadlock Handling.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Non-volatile Storage, Advanced Recovery Techniques, Remote Backup Systems.

UNIT VIII: OVERVIEW OF STORAGE AND INDEXING

Data on External Storage, File Organizations and Indexing, Index Data Structures, Comparison of File Organizations, Indexes and Performance Tuning.

Tree-Structured Indexing: Intuition for Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Tree Structure.

TEXT BOOK:

1. Raghurama Krishnan, Johannes Gehrke, *Database Management Systems*, 3 ed, Tata McGrawHill, 2007.
2. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, *Database System Concepts,* 5 ed, McGraw-Hill, 2005.

REFERENCE BOOKS:

1. Elmasri Navate, *Fundamentals of Database Systems*, Pearson Education,1994.
2. Peter Rob and Carlos Coronel, *Database Systems Design, Implementation and Management*, 7 ed, 2009.
3. Pranab Kumar Das Gupta, *Database Management System Oracle SQL and PL/SQL*, PHI Learning Private Limited, 2009.

III B.Tech. I Semester

10BT51201: SOFTWARE ENGINEERING

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO SOFTWARE ENGINEERING

The evolving role of software, Changing Nature of Software, Software myths.

A Generic View of Process: Software engineering - A layered technology, a process framework, Process patterns, process assessment, personal and team process models.

UNIT-II: PROCESS MODELS

The Waterfall model, Incremental model, RAD model, Prototyping, Spiral model, Concurrent Development model, The Unified process, Agile process models.

Software Requirements: Functional and Non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT-III: REQUIREMENTS ENGINEERING PROCESSES

Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System Models: Context models, Behavioral models, Data models, Object models, Structured methods.

UNIT-IV: DESIGN ENGINEERING

Design process and Design quality, Design concepts, the design model.

Creating an Architectural Design: Software Architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT-V: USER INTERFACE DESIGN AND RE-ENGINEERING

Performing User Interface Design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

Re-Engineering: Reverse Engineering, Restructuring, Forward Engineering.

UNIT-VI: SOFTWARE TESTING

A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, System testing, the art of Debugging.

UNIT-VII: SOFTWARE METRICS

Product Metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Size Oriented Metrics, Function-Oriented Metrics, Reconciling LOC and FP Metrics, Object-Oriented Metrics, Use-Case Oriented Metrics, Web Engineering Project Metrics, Metrics for Software Quality.

UNIT-VIII: RISK AND QUALITY MANAGEMENT

Risk Management: Reactive vs. Proactive Risk strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation Monitoring and Management (RMMM), RMMM Plan.

Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability, The ISO 9000 Quality Standards, The Capability Maturity Model Integration (CMMI).

TEXT BOOKS:

1. Roger S. Pressman, Software Engineering, A practitioner's Approach, 6th edition, McGrawHill International Edition, 2005.
2. Sommerville, Software Engineering, 7th edition, Pearson Education, 2006.

REFERENCE BOOKS:

1. K.K. Agarwal & Yogesh Singh, Software Engineering, 3rd edition, New Age International Publishers, 2007.
2. James F. Peters, Witold Pedrycz, John Wiely, Software Engineering, an Engineering approach, 2000.
3. Shely Cashman Rosenblatt, Systems Analysis and Design, 6th edition, Thomson Publications, 2006.

III B.Tech. I Semester

10BT50504:**OPERATING SYSTEMS**

L	T	P	C
4	-	-	4

UNIT I: OPERATING SYSTEMS OVERVIEW

Introduction, Operating system operations, Process management, Memory management, Storage management, Protection and Security, Distributed Systems, Special purpose systems.

Operating systems structures: Operating system services and Systems calls, System programs, Operating system structure, Operating systems generations.

UNIT II: PROCESS MANAGEMENT

Process concepts, Process state, Process control block, Scheduling queues, Process scheduling, Multithreaded programming, threads in UNIX, Comparison of UNIX and Windows.

UNIT III: CONCURRENCY AND SYNCHRONIZATION

Process synchronization, Critical-section problem, Peterson's Solution, Synchronization Hardware, semaphores, Classic problems of synchronization, Readers and Writers problem, Dining-philosophers problem, Monitors, Synchronization examples(Solaris), atomic transactions. Comparison of UNIX and Windows.

UNIT IV: DEADLOCKS

System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock- bankers algorithm.

UNIT V: MEMORY MANAGEMENT

Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, Allocation of frames, Thrashing, case study-UNIX.

UNIT VI: FILE SYSTEM

Concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and Windows.

UNIT VII: I/O SYSTEM

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling algorithms, swap-space management, stable-storage implementation, Tertiary storage structure.

I/O: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT VIII: PROTECTION AND SECURITY

Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights. Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, 7 ed, John Wiley.

REFERENCE BOOKS:

1. Stallings, *Operating Systems, Internals and Design Principles*, 5 ed, Pearson Education, 2006.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2 ed, PHI, 2007.
3. Deitel & Deitel, *Operating systems*, 3 ed, Pearson Education, 2008.
4. Crowley, *Operating systems Oriented Approach*, TMH, 1998.
5. Dhamdhere, *Operating systems*, Second Edition, TMH, 2008.

III B.Tech. I Semester

10BT50511: MICROPROCESSORS AND INTERFACING LAB

L	T	P	C
-	-	3	2

I. Microprocessor 8086:

1. Introduction to MDS.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. Interfacing:

1. 8259 – Interrupt Controller: Generate an interrupt using 8259.
2. 8279 – Keyboard Display: Write a small program to display a string of characters.
3. 8255 – PPI: Interfacing DAC, Stepper Motor, ADC.
4. 8251 – USART: Write a program in ALP to establish Communication between two processors.

III. Microcontroller 8051

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

III B.Tech. I Semester

10BT50512: DATABASE MANAGEMENT SYSTEMS LAB

L	T	P	C
-	-	3	2

DESCRIPTION OF SALES DATABASE

ABC is a company operating in the country with a chain of shopping centers in various cities. Everyday large numbers of items are sold in different shopping centers. The Sales database comprises of various tables like CUST, PROD, SALES_DETAIL, STATE_NAME with the following schemas.

CUST TABLE

Name	Type	Remark
CID	VARCHAR2(6)	PRIMARY KEY
CNAME	VARCHAR2(10)	
CCITY	VARCHAR2(8)	

PROD TABLE

Name	Type	Remark
PID	VARCHAR2(6)	PRIMARY KEY
PNAME	VARCHAR2(6)	
PCOST	NUMBER(4,2)	
PPROFIT	NUMBER(3)	

SALES_DETAIL

Name	Type	Remark
CID	VARCHAR2(6)	COMPOSITE PRIMARY KEY
PID	VARCHAR2(6)	COMPOSITE PRIMARY KEY
SALE	NUMBER(3)	
SALEDT	DATE	COMPOSITE PRIMARY KEY

STATE_NAME

Name	Type	Remark
CCITY	VARCHAR2(8)	PRIMARY KEY
STATE	VARCHAR2(15)	

1. ER MODEL

Draw an ER Model indicating many to many relationship between CUST vs PROD. Show the Cardinality Ratio between PROD and SALES_DETAIL is one-to-many because one product can be sold multiple times. Similarly show the Cardinality Ratio between CUST and SALES_DETAIL is one-to-many because one customer can purchase many products. Indicate CID# and PID# are unique in CUST and PROD entity respectively, where as CID and PID in SALE_DETAIL entity may occur many times.

Represent the ER Model in Tabular Form.

2. NORMALIZATION

In the above relations the following Functional Dependencies exist:

CID → CNAME, CCITY, STATE

PID → PNAME, PCOST, PPROFIT

CID, PID, SALEDT → SALE

CID#	CNAME	CCITY	STATE	PID#	PNAME	PCOST	PROFIT	SALE	SALEDT#
C1	RAVI	HYD	AP	P1	CD	10		5	14-JUL-10
				P3	DVD	20	10	2	14-JUL-10
				P3	DVD	20	10	3	20-AUG-09

Normalize the above table into 1NF, 2NF and 3NF. And handle Insert, Delete and Update anamolies.

3. DATA RETRIEVAL

a) Write a query to display all columns of CUST table.
b) Write a query to display pname of all records. Sort all records by pname. (use order by clause)
c) Write a query to display cname and ccity of all records. Sort by ccity in descending order.
d) Write a query to display cname, ccity who lives in mysore.
e) Write a query to display cname, pname, sale, saledt for all customers.
f) Write a query to display cname who have purchased Pen.
g) Write a query to display saledt and total sale on the date labeled as sale of all items sold after 01-sep-2010.

h) Write a query to display saledt and total sale on the date labeled as sale of all items other than DVD.
i) Write a query to display cname and ccity of all customers who live in Kolkata or Chennai.

4. USE OF DISTINCT, BETWEEN, IN CLAUSE, LIKE OPERATOR, DUAL

a) Write a query to display the pname and pcost of all the customers where pcost lies between 5 and 25.
b) Find the product ids in sale_detail table(eliminating duplicates).
c) Write a query to display distinct customer id where product id is p3 or sale date is '18-mar-2011'.
d) Write a query to display cname, pid and saledt of those customers whose cid is in c1 or c2 or c4 or c5.
e) Write a query to display cname, pid, saledt of those customers whose pid is p3 or sale date is '20-dec-2009'.
f) Write a query to display system date.
g) Write a query to display all records of prod table in which first and third character of pname is any character and second character is 'E'.
h) Write a query to display all cname which includes two 'A' in the name.

5. CONSTRAINTS

a) Implement table level and Column level constraints like NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK.

6. SINGLE ROW FUNCTIONS: DATE FUNCTION

a) Write a query to display the system date by rounding it to next month.
b) Write a query to display the system date by rounding it to next year.
c) Write a query to display the last date of the system date.
d) Write a query to display the next date of system date which is Friday.
e) Write a query to display sale date and date after 02 months from sale date.

f) Write a query to display system date, sale date and months between two dates.
g) Write a query to display the greatest date between sale date and system date, name it as BIG, also display sale date and SYSDATE.
h) Write a query to display the least date between sale date and system date name it as SMALL, also display sale date and SYSDATE.

7. SINGLE ROW FUNCTIONS: NUMERIC AND CHARACTER FUNCTION

a) Write a query to display the product name along with the rounded value of product cost for product name is "Pencil".
b) Write a query to display product cost along with MOD value if divided by 5.
c) Write a query to display cname in uppercase, lowercase, titlecase from cust table where customer name is "rohan".
d) Write a query to display all concatenated value of cname, ccity by converting cname into titlecase and ccity into uppercase.
e) Write a query to display the first 3 characters of cname.
f) Write a query to display the position of 'M' in the cname of the customer whose name is "SAMHITA".
g) Write a query to display the length of all customer names.
h) PAD # character in left of product cost to a total width of 5 character position.

8. GROUP FUNCTIONS AND SET FUNCTIONS

a) Write a query to display the total count of customer.
b) Write a query to display the minimum cost of product.
c) Write a query to display average value of product cost rounded to 2nd decimal places.
d) Write a query to display product name with total sale detail in descending order.
e) Write a query to display product name, sale date and total amount collected for the product.
f) Write a query to display sale date and total sale date wise which was sold after "14-jul-08".

g) Write a query to display the customer name who belongs to those places whose name is having I or P.

h) Write a query to display customer name who belongs to a city whose name contains characters 'C' and whose name contains character 'A'.

i) Write a query to display the customer name who does not belong to PUNE.

9. PL/SQL

a) Write a PL/SQL program to find largest number among three. (Hint: Use Conditional Statement)

b) Write a PL/SQL program to display the sum of numbers from 1 to N using for loop, loop…end and while…loop.

10. SQL CURSOR

a) Write a PL/SQL program to display the costliest and cheapest product in PROD table.

b) Write a PL/SQL program which will accept PID and display PID and its total sale value i.e. sum.

11. FUNCTIONS

a) Write a function that accepts two numbers A and B and performs the following operations.

   i. Addition
   ii. Subtraction
   iii. Multiplication
   iv. Division

b) Write a function that accepts to find the maximum PCOST in PROD table.

12. PROCEDURES

a) Write a procedure that accepts two numbers A and B, add them and print.

b) Write procedures to demonstrate IN, IN OUT and OUT parameter.

13. TRIGGER

a) Develop a PL/SQL program using BEFORE and AFTER triggers.

14. CURSOR

a) Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

III B.Tech. I Semester

10BT4HS02: ADVANCED ENGLISH COMMUNICATION SKILLS

(AUDIT COURSE)

L	T	P	C
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UNIT I: VOCABULARY BUILDING:

Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.

Functional English: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT II: READING COMPREHENSION

Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

UNIT III: ACADEMIC ESSAY WRITING

Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

Unit IV: TECHNICAL REPORT WRITING

Types of formats and styles, Subject-matter, Subject-organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

Unit V: CAREER SKILLS

Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.

UNIT VI: RESUME WRITING

Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

UNIT VII : GROUP DISCUSSION

Dynamics of group discussion, Intervention, Summarizing, Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

Unit VIII: INTERVIEW SKILLS

Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, "Effective Technical Communication Skills", Tata McGraw Hill, New Delhi, 2005.
2. Meenakshi Raman and Sangetha Sharma, "Technical Communi cation, Principles and Practice", Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, "Secrets of Success in Interviews", Crucial Books, Secunderabad, 2007.
4. M. Ashraf Rizvi, "Resumes and Interviews - The Art of Wining",Tata Mc Graw Hill, New Delhi, 2008.
5. Gopala Swamy Ramesh and Mahadevan Ramesh, "The Ace of Soft Skills: Attitude, Communication and Etiquette for Success", Pearson Education, New Delhi, 2009.

SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.

III B.Tech. II Semester

10BT60501: THEORY OF COMPUTATION

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UNIT–I: INTRODUCTION TO THEORY OF AUTOMATA

Strings, Alphabets, Language, Operations on sets, Definition of an automaton, Description of a Finite Automaton (FA), Transition systems, Properties of transition functions, Acceptability of a string by a finite automaton.

UNIT-II: FINITE AUTOMATA

Deterministic finite automata(DFA), Nondeterministic finite automata(NFA), The language of a DFA, The Language of an NFA, NFA with ϵ-transitions, Equivalence between NFA with and without ϵ-transitions, NFA to DFA conversion, Equivalence between two finite state machines, Finite automata with output-Mealy and Moore machines, Minimization of finite automata.

UNIT-III: REGULAR EXPRESSIONS

Regular expressions, Regular sets, Identity rules, Constructing finite automata for a given regular expressions, Conversion of finite automata to regular expressions, Pumping lemma for regular sets, Applications of pumping lemma, Closure properties of regular sets.

UNIT-IV: FORMAL LANGUAGES

Basic definitions and examples, Chomsky classification of languages, Languages and their relation, Languages and automata, Regular grammars- Right linear and Left linear grammars, Equivalence between regular linear grammar and FA.

Context Free Grammars: Definition of context free grammars(CFG), Leftmost and rightmost derivations, The language of a grammar, Sentential forms, Constructing parse trees, The yield of a parse tree, Ambiguous grammars, Removing ambiguity from grammars.

UNIT-V: CONTEXT FREE LANGUAGES

Simplification of CFG, Eliminating useless symbols, Elimination of NULL productions, Elimination of unit productions, Chomsky Normal Form (CNF), Greibach Normal Form(GNF), Pumping lemma for context free languages(CFL).

UNIT-VI: PUSHDOWN AUTOMATA

Definition of pushdown automaton(PDA), The Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic pushdown automaton.

UNIT-VII: TURING MACHINES AND LINEAR BOUNDED AUTOMATA

Turing Machine model, Representation of Turing Machines(TM), Languages acceptability by Turing Machines, Design of Turing Machines, Computable functions, Recursively enumerable languages, Church's hypothesis, Counter machine, Types of Turing Machines, The model of linear bounded automaton(LBA), Turing Machines and type 0 grammar, Linear bounded automata and Languages.

UNIT-VIII: COMPUTABILITY THEORY

LR(k) grammar, Universal Turing Machines, Undecidable problems about Turing Machines, Post's Correspondence Problem, The Classes P and NP, An NP-Complete and NP-Hard Problems.

TEXT BOOK:

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, *Introduction to Automata Theory Languages and Computation,* 2nd edition, Pearson Education, 2005.

REFERENCE BOOKS:

1. K.L.P Mishra and N. Chandrashekaran, *Theory of Computer Science-Automata Languages and Computation,* 2nd edition, PHI, 2003.
2. John C Martin, *Introduction to Languages and the Theory of Computation,* 3rd edition, Tata McGraw Hill, 2003.
3. Daniel I.A. Cohen, *Introduction to Computer Theory,* 2nd edition, John Wiley, 2007.

III B.Tech. II Semester

10BT60502: **UNIX PROGRAMMING**

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UNIT-I: INTRODUCTION TO UNIX AND UNIX UTILITIES

A Brief history of Unix, Architecture of Unix, Features of Unix, Introduction to vi editor. General Purpose Utilities, File Handling Utilities, Security by File Permissions, Process Utilities, Disk Utilities, Networking Commands, detailed commands to be covered are passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

UNIT-II: TEXT PROCESSING AND BACKUP UTILITIES

Text Processing Utilities and Backup Utilities , detailed commands to be covered are cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT-III: WORKING WITH THE BOURNE AGAIN SHELL (BASH)

Shell, Shell Responsibilities, Types of Shell, Pipes and I/O Redirection, Shell as a Programming Language, Shell Syntax: Variables, Conditions, Control Structures, Commands, Command Execution, Here Documents, and Debugging Scripts.

UNIT-IV: UNIX FILE STRUCTURE

Introduction to Unix File System, Inode (Index Node), File Descriptors, System Calls and Device Drivers, Library Functions.

Low Level File Access: open, read, write, close, lseek, stat, fstat, lstat, ioctl, umask, dup and dup2.

The Standard I/O Library: fopen, fread, fwrite, fclose, fflush, fseek, fgetc, fputc, fgets.

Formatted Input and Output: printf, fprintf, sprint, scanf, fscanf, and sscanf.

File and Directory Maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd, Scanning Directories: opendir, readdir, telldir, seekdir, closedir.

UNIT-V: PROCESS AND SIGNALS

Process, Process Identifiers, Process Structure: Process Table, Viewing Processes, System Processes, Process Scheduling, Starting New Processes: Waiting for a Process, Zombie Processes, fork, vfork, exit, wait, waitpid, exec, Signals functions, Unreliable Signals, Interrupted System Calls, kill, raise, alarm, pause, abort, system, sleep Functions, Signal Sets.

UNIT-VI: DATA MANAGEMENT AND FILE LOCKING

Data Management: Managing Memory: malloc, free, realloc, calloc, File Locking: Creating Lock Files, Locking Regions, Use of Read and Write with Locking, Competing Locks, Other Lock Commands-Advisory Locking,Mandatory Locking;Deadlocks.

UNIT- VII: INTER-PROCESS COMMUNICATION

Pipe, Process Pipes, The Pipe Call, Parent and Child Processes, Named Pipes: FIFOs, Semaphores: semget, semop, semctl, Message Queues: msgget, msgsnd, msgrcv, msgctl, Shared Memory: shmget, shmat, shmdt, shmctl, IPC Status Commands.

UNIT-VIII: INTRODUCTION TO SOCKETS

Socket, Socket Connections - Socket Attributes, Socket Addresses, socket, connect, bind, listen, accept, Socket Communications.

TEXT BOOK:

1. W. Richard. Stevens, *Advanced Programming in the UNIX Environment*, 1 ed, Pearson Education, 2005.

REFERENCE BOOKS:

1. Sumitabha Das, *Your Unix The Ultimate Guide*, TMH, 2007.
2. Neil Matthew, *Richard Stones, Beginning Linux Programming*, 3 ed, Wiley Dreamtech India (P) Ltd.
3. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, *UNIX Network Programming - The Sockets Networking API*, 3 ed, Volume 1, PHI Learning Private Limited.

III B.Tech. II Semester

10BT60503: DATA WAREHOUSING AND DATA MINING

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UNIT-I: DATA WAREHOUSE AND OLAP TECHNOLOGY

Data Warehouses – Definitions – Multidimensional Data Model – Data Warehouse Architecture.(Chapter 3;Sections 3.1-3.3 including sub topics of the Text book)

UNIT-II: INTRODUCTION TO DATA MINING

Definition of Data Mining – Kinds of Data – Data Mining Functionalities– Classification of Data Mining Systems – Primitives – Major Issues in Data Mining.

UNIT-III: DATA PREPROCESSING

Descriptive Data Summarization- Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT-IV: MINING FREQUENT PATTERNS AND ASSOCIATIONS

Basic Concepts – Efficient and Scalable Frequent Itemset Mining Methods – Association Rule Mining.(Chapter 5;Sections 5.1-5.5 including subtopics of Text book)

UNIT-V: CLASSIFICATION

Decision Tree Induction, Bayesian Classification – Rule Based Classification, Prediction – Accuracy and Error Measures.

UNIT-VI: CLUSTER ANALYSIS

Cluster Analysis – Categories of Clustering Methods – Partitioning Methods – Hierarchical Methods – Density based Methods – Grid based methods – Model Based Clustering methods – Clustering High Dimensional Data – CLIQUE.

UNIT-VII: MINING STREAM, TIME SERIES AND SEQUENCE DATA

Mining data streams, Mining Time Series Data, Mining Sequence Patterns in Biological Data.

UNIT-VIII: MINING OBJECT, SPATIAL, MULTIMEDIA, TEXT AND WEB

Multi Dimensional Analysis on Complex Object data types – Descriptive Mining on Complex Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Web Mining.

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, *Data Mining: Concepts and Techniques*, 2 ed, Elsevier, 2008.

REFERENCE BOOKS:

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics*, 2 ed, Pearson Education, 2006.
2. Amitesh Sinha, *Data Warehousing*, Thomson Learning, 2007
3. Xingdong Wu, Vipin Kumar, *The Top Ten Algorithms in Data Mining*, Taylor and Francis Group, 2009.
4. Max Barmer, *Principles of Data Mining*, Springer, 2007

III B.Tech. II Semester

10BT61201: OBJECT ORIENTED ANALYSIS AND DESIGN

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UNIT-I: INTRODUCTION TO UML

Introduction to object oriented concepts like inheritance, polymorphism, information hiding, Importance of modeling, principles of modeling, object oriented modeling, An overview of UML, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT-II: BASIC STRUCTURAL MODELING

Classes-Terms and concepts, Common modeling techniques, Relationships-modeling simple dependencies, single Inheritance and structural relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, Instances.

UNIT-III: CLASS AND OBJECT DIAGRAMS

Terms, concepts, modeling techniques for Class Diagram-modeling Simple collaboration, Logical database Schema Forward and Reverse Engineering, Object Diagrams-Modeling object structures, Forward and reverse engineering.

UNIT-IV: BASIC BEHAVIORAL MODELING-I

Interactions-Terms and concepts, modeling a flow of control, Interaction diagrams-terms and concepts, modeling flows of control by time ordering and control by organization, Forward and reverse Engineering.

UNIT-V: BASIC BEHAVIORAL MODELING-II

Use cases-terms and concepts, modeling the behavior of the element, Usecase Diagrams-Terms and concepts, modeling the context of a system and requirement of a system, Forward and reverse Engineering, Activity Diagrams-Terms and concepts, modeling a workflow and an operation, Forward and reverse Engineering.

UNIT-VI: ADVANCED BEHAVIORAL MODELING

Events and signals-modeling a family of signals and exceptions, state machines-modeling the lifetime of an object, state machines, processes and Threads-modeling multiple flows of control and interprocess communication, time and space-modeling timing constraints, distribution of objects and objects that migrate, state chart diagrams-modeling reactive objects and Forward and reverse Engineering.

UNIT-VII: ARCHITECTURAL MODELING

Component-Terms and concepts,modeling executables and Libraries, modeling tables, .file, and documents, modeling an API, modeling source code, Deployment-modeling processors and devices, modeling the distribution of components, Component diagrams-modeling source code, executable release, physical database, Adaptable Systems, Forward and reverse Engineering and Deployment diagrams-modeling an embedded systems, Client/server System, Fully distributed systems, Forward and reverse Engineering.

UNIT-VIII: CASE STUDIES

Model all the views of: Automation of a Library, Point of Sales System.

TEXT BOOK:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, *The Unified Modeling Language User Guide,* 2 ed, Pearson Education, 2009.

REFERENCE BOOKS:

1. Magnus Penker, Brian Lyons, David Fado, Hans-Erik Eriksson, *UML 2 Toolkit,* WILEY-Dreamtech India Pvt. Ltd., 2006.
2. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML*, Pearson Education, 2000.
3. Pascal Roques, *Modeling Software Systems Using UML2*, WILEY-Dreamtech India Pvt. Ltd, 2004.
4. Craig Larman, *An introduction to Object – Oriented Analysis and Design and Unified Process Appling UML and Patterns*, 3 ed, Pearson Education.
5. John W. Satzinger, Robert B Jackson and Stephen D Burd, *Object-Oriented Analysis and Design with the Unified Process*, Cengage Learning, 2004.
6. R.C.Lee, and W.M.Tepfenhart, *UML and C++*, PHI, 2001.

III B.Tech. II Semester

10BT60504: DISTRIBUTED COMPUTING

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UNIT-I: INTRODUCTION

Forms of computing-Strengths and weaknesses of distributed computing-OS overview-Network overview-Software Eng. overview.

UNIT-II: INTERPROCESS COMMUNICATION

IPC program interface-Event synchronization-Timeouts and threading- Deadlock and timeouts-Data representation- Data encoding-Text based protocols-Request response protocols-Event and sequence diagram-Connection vs connectionless IPC.

UNIT-III: DISTRIBUTED COMPUTING PARADIGMS

Message passing, client server, peer to peer, message system, remote procedure, call model, distributed objects, object space, mobile agent, network services, collaborative application - Abstraction, Tradeoffs: abstraction vs overhead, scalability, cross-platform.

UNIT-IV: SOCKET API

Socket metaphor, diagram socket API stream mode socket API, sockets with non-blocking I/O, secure socket API, Client server paradigm, Issues, service session, protocol for a service, Inter-process communications & event synchronization, data representation, Software engineering for a network service, software architecture, IPS Mechanism, Daytime client server, Connection oriented and connectionless servers, Echo client server, Iterative server and concurrent server, Stateful servers - global state information, session state information.

UNIT-V: GROUP COMMUNICATION

Unicasting, Multicasting, Multicast API, Connection oriented and connectionless Reliable, Unreliable multicast, Java Basic Multicast API-IP Multicast addresses, Joining/sending multicast group.

Distributed Objects-message passing vs distributed object, distributed object architecture, distributed object systems, remote procedure calls, Java RMI architecture, client side, server side, object registry, API for Java RMI, Remote interface, server side software, client side software, RMI vs socket API.

UNIT-VI: REMOTE METHOD INVOCATION (RMI)

Client callback, Client side, Server side, Stub downloading, RMI Security manager Instantiation of a Security manager, Java security policy file, Specifying stub downloading and a security policy file, Algorithms for building RMI application, Allowing for Stub downloading.

Internet applications-HTML, XML, HTTP, Client request, Server response Content type and MIME,HTTP: connection oriented, stateless protocol, Dynamically generated web contents, Common gateway interface, Web form, Query string processing Encoding and decoding query strings, Environment variables in CGI, Web session and session state data, hidden form feeds for transferring session state data, cookies for transferring session state data, HTTP header lines.

UNIT-VII: DATA PRIVACY AND SECURITY CONCERNS

Internet Applications - Applets, Servlets, Architectural Support, Servlet programming, State information maintenance, Web services, Simple Object Access Protocol, SOAP request, SOAP response, Apache SOAP, Invoking web service, Implementing web service.

UNIT-VIII: ADVANCED DISTRIBUTED COMPUTING PARADIGMS:

Message Queue system paradigm - Point to point, Publish/ Subscribe, Mobile Agents - Basic architecture, Advantages, Mobile agent framework systems, Network services, Object spaces.

TEXT BOOK:

1. M. L. Liu, *Distributed Computing: Principles and Applications*, Pearson/Addison-Wesley, 2004.

REFERENCE BOOKS:

1. A. Taunenbaum, *Distributed Systems: Principles and Paradigms*, Pearson, 2005.
2. G. Coulouris, J. Dollimore and T. Kindberg, *Distributed Systems: Concepts and Design*, 2 ed, Pearson Education.
3. Hagit Attiya, Jennifer Welch, *Distributed Computing: Fundamentals, Simulations, and Advanced Topics,* 2 ed, Wiley Series on Parallel and Distributed Computing.

III B.Tech. II Semester

10BT71204: CRYPTOGRAPHY AND NETWORK SECURITY

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UNIT - I: INTRODUCTION

Security Attacks - Interruption, Interception, Modification and Fabrication. Security Services - Confidentiality, Authentication, Integrity, Non-repudiation, Access control and Availability. Security Mechanisms - A model for Internetwork security, Internet Standards and RFCs, Conventional Encryption Principles, Ceaser Cipher, Hill cipher, Poly and Mono Alphabetic Cipher.

UNIT - II: ENCRYPTION PRINCIPLES

Conventional encryption algorithms: Feistal structure, DES algorithm, S-Boxes, Triple DES, Advanced Data Encryption Standard (AES),Cipher block modes of operation, location of encryption devices, Key Distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT - III: CRYPTOGRAPHY AND APPLICATIONS

Public key cryptography principles, public key cryptography algorithms, Digital signatures, RSA, Elliptic Algorithms, Digital Certificates, Certificate Authority and key management, Kerberos, X.509, Directory Authentication Service.

UNIT - IV: ELECTRONIC MAIL SECURITY

Email privacy: PGP operations, Radix-64 Conversion, Key Management for PGP, PGP Trust Model, Multipurpose Internet Mail Extension (MIME), Secure/MIME(S/MIME).

UNIT - V: IP SECURITY ARCHITECTURE AND SERVICES

IP Security Overview, IP Security Architecture, Security Association, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management: OAKELY key determination protocol, ISAKMP.

UNIT – VI: WEB SECURITY

Web Security Considerations, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - VII: NETWORK MANAGEMENT SECURITY

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.
System Security: Intruders-Intrusion techniques, Intrusion Detection, Password Management, Bot nets.
Malicious Software: Viruses and related threats, Virus Counter Measures, Distributed Denial of Service Attacks.

UNIT - VIII: FIREWALLS

Firewall Design principles, Trusted Systems, Common Criteria for Information Technology Security Evolution.

TEXT BOOKS:

1. William Stallings, *Network Security Essentials* (Applications and Standards), 3 ed, Pearson Education.
2. Stallings, *Cryptography and network Security*, 3 ed, PHI/Pearson

REFERENCE BOOKS:

1. Eric Maiwald, *Fundamentals of Network Security*, (Dreamtech press), 2004.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World*, 2 ed, Pearson/ PHI.
3. Robert Bragg, Mark Rhodes, *Network Security: The complete reference*, TMH, 2004.
4. Buchmann, *Introduction to Cryptography*, 2 ed, Springer, 2004.

III B.Tech. II Semester

10BT61211: OBJECT ORIENTED ANALYSIS AND DESIGN LAB

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Case studies given below should be Modeled using Rational Rose tool in different views i.e Use case view, logical view, component view, Deployment view.

CASE STUDY 1: LIBRARY INFORMATION SYSTEM

Problem Statement:

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned by the library that person is notified. The library can easily create, update and delete information about the titles, members, loans and reservations in the systems.

CASE STUDY 2: A POINT OF SALE (POS) SYSTEM

Problem Statement:

A POS System is a computerized application used to record sales and handle payments; it is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third-party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services and temporarily unavailable they must still be of capturing sales and handling at least cash payments. A POS system must support multiple and varied client – side terminals and interfaces such as browser, PDA's, touch – screens.

CASE STUDY 3: AUTOMATED TELLER MACHINE (ATM)

Problem Statement:

Software is designed for supporting a computerized ATM banking network. All the process involved in the bank is

computerized these days. All the accounts maintained in the bank and also the transactions effected, including ATM transactions are to be processed by the computers in the bank. An ATM accepts a relevant cash card, interacts with user, communicates with the central system to carry out the transaction, dispenses cash, and prints receipts. The system to be designed and implemented must include appropriate record keeping and security provisions. The system must handle concurrent access to the same account.

CASE STUDY 4: ONLINE TICKET RESERVATION FOR RAILWAYS

Problem Statement:

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, date of journey, destination, class of train etc. The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes i.e. Sleeper class, First class and the AC compartment. Design the application for the above problem description.

CASE STUDY 5: RECRUITMENT PROCEDURE FOR SOFTWARE INDUSTRY

Problem Statement:

In the software industry the recruitment procedure is the basic thing that goes in the hand with the requirement as specified by the technical management team. HR first gives an advertisement in leading Newspapers, Journals, Weeklies and Websites. The job seekers can apply for it through by Post or by e-mail to the company.

The technical skill and the experience of the candidates are reviewed and the short listed candidates are called for the interview.

There may be different rounds for interview like the written test, technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidates names are displayed. Mean while HR gives all the details about the salary, working hours, terms and conditions and the retirement benefit to the candidate.

CASE STUDY 6: DESIGN A STUDENT REGISTRATION SYSTEM

Problem Statement:

Each student has access to his or her course and grade information only and must be authenticated prior to viewing or updating the information. A course instructor will use the system to view the list of courses he or she is assigned for a given semester or has taught previously, view the list of students registered for the course(s) he or she is teaching, and record final grades for each student in the course(s). TA assignments will also be viewable through this system. Instructors must also be authenticated prior to viewing or updating any information.

CASE STUDY 7: ONLINE AUCTION SALES

Problem Statement:

The online auction system is a design about a website where sellers collect and prepare a list of items they want to sell and place it on the website for visualizing. To accomplish this purpose the user has to access the site. Incase it's a new user he has to register. Purchaser's login and select items they want to buy and keep bidding for it. Interacting with the purchasers and sellers through messages does this. There is no need for customer to interact with the sellers because every time the purchasers bid, the details will be updated in the database. The purchaser making the highest bid for an item before the close of the auction is declared as the owner of the item. If the auctioneer or the purchaser doesn't want to bid for the product then there is fixed cutoff price mentioned for every product. He can pay that amount directly and own the product. The purchaser gets a confirmation of his purchase as an acknowledgement from the website. After the transition by going back to the main menu where he can view other items.

REFERENCE BOOKS:

1. Grady Booch, James Rum Baugh, Ivar Jacobson, *The Unified Modeling Language User Guide*, 2 ed, Pearson Education, 2009
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit*, WILEY-Dreamtech India Pvt. Ltd., 2003.
3. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML*, Pearson Education, 2000.
4. Pascal Roques, *Modeling Software Systems Using UML2*, WILEY-Dreamtech India Pvt. Ltd, 2004.
5. Craig Larman, *An introduction to Object – Oriented Analysis and Design and Unified Process Applying UML and Patterns*, Pearson Education, 2002.

III B.Tech. II Semester

10BT60511: **UNIX PROGRAMMING LAB**

L	T	P	C
-	-	3	2

List of Practicals:

1 Study and Practice on various commands like
man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w.

2 Study and Practice on various commands like
cat, tail, head , sort, nl, uniq, grep, egrep,fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

3 a) Write a Shell Program to print all .txt files and .c files.
b) Write a Shell program to move a set of files to a specified directory.
c) Write a Shell program to display all the users who are currently logged in after a specified time.
d) Write a Shell Program to wish the user based on the login time.

4 a) Write a Shell program to pass a message to a group of members, individual member and all.
b) Write a Shell program to count the number of words in a file.
c) Write a Shell program to calculate the factorial of a given number.
d) Write a Shell program to generate Fibonacci series.

5 a) Write a Shell program to print all prime numbers between 1 and n.
b) Write a Shell program to count no of lines in a text file which starts with a specified letter (Use grep command).

6 a) Simulate **cat** command. b) Simulate **cp** command.

7 a) Simulate **head** command. b) Simulate **tail** command.

8 a) Simulate **mv** command. b) Simulate **nl** command.

9 Write a program to handle the signals like **SIGINT, SIGQUIT, SIGFPE**.

10 Implement the following IPC forms
a) **FIFO** b) **PIPE**

11 Implement **message queue** form of IPC.

12 Implement **shared memory** form of IPC.

13 Write a Socket program to print system date and time (Using TCP/IP).

III B.Tech. II Semester

10BT60513: KNOWLEDGE ENGINEERING LAB

(AUDIT COURSE)

L	T	P	C
-	-	3	-

Data Warehousing Exercises:

1. **Introduction to Informatica Power Center 7.1.1 and Introduction to Oracle 9i**
2. **Adding a Repository**
   a. Create a Source Definition using source connection and import the employee data from source table.
   b. Organize the columns in the table view to the requirement of Data Analysis.
   c. Create a Target Definition using target connection to the target table.
   d. Create tables for transformation and generate SQL to perform transformation.
3. **Mapping**
   a. Perform an ETL on Employees database. Select the employee table as the source and the same as the target and assume connectivity and delimiters as pipe without any specific transformations.
   b. Perform an ETL on Employees database. Select the employee table as the source and the same as the target and assume connectivity and delimiters as pipe using expression transformation, filter transformation, router transformation, aggregator transformation and joiner transformation.
   c. Perform and ETL on Employees database, connect the source and target and then perform debug on the filter transformation mapping.
4. **Lookup**
   a. Using the above mappings perform connected lookup with lookup transformation using natural keys and populate the other keys with default values.

Data Mining Exercises:

Associations

1. Derive associations manually from the following dataset.

Outlook	Temperature	Humidity	Windy	Play
Sunny	hot	high	false	no
Sunny	hot	high	true	no
Overcast	hot	high	false	yes
Rainy	mild	high	false	yes
Rainy	cool	normal	false	yes
Rainy	cool	normal	true	no
Overcast	cool	normal	true	yes
Sunny	mild	high	false	no
Sunny	cool	normal	false	yes
Rainy	mild	normal	false	yes
Sunny	mild	normal	true	yes
Overcast	mild	high	true	yes
Overcast	hot	normal	false	yes
Rainy	mild	high	true	no

Clustering

2. Open Weka and Load the data set editor. Get familiarize with the editor operations.
    a. Load the weather.nominal dataset. Use the filter weka.unsupervised.instance.RemoveWithValues to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text RemoveWithValues. Then click on it to get the Generic Object Editor window, and figure out how to change the filter settings appropriately.
    b. Undo the change to the dataset that you just performed, and verify that the data has reverted to its original state.
3. Choosing k-means clustering algorithm for clustering use the Cancer data (.arff) perform clustering with a Euclidean distance function and visually inspect the nature of the clusters.

Classification

4. Choosing an appropriate filter for classification use the Iris data (.arff) perform classification and visualize the classification tree.
5. The glass dataset glass.arff from the U.S. Forensic Science Service contains data on six types of glass. Glass is described by its refractive index and the chemical elements that it contains; the aim is to classify different types of glass based on these features. This dataset is taken from the UCI datasets, which have been collected by the University of California at Irvine and are freely available on the Web. They are often used as a benchmark for comparing data mining algorithms. Find the dataset glass.arff and load it into the Explorer interface. For your own information, answer the following exercises. How many attributes are there in the dataset? What are their names? What is the class attribute? Run the classification algorithm IBk (weka.classifiers.lazy.IBk). Use cross-validation to test its performance.

IV B.Tech. I Semester

10BT71201: **WEB PROGRAMMING**

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO HTML

Basic HTML, the document body, text, hyperlinks, lists, tables, images, frames, forms, Cascading Style Sheets: Introduction, simple examples, defining your own styles, properties and values in styles, formatting blocks of information, layers.

UNIT-II: JAVA SCRIPT

Basics, variables, string manipulation, arrays, functions, objects in java script, introduction to DHTML.

UNIT-III: EXTENSIBLE MARK-UP LANGUAGE (XML)

XML basics, Document Type Definition, XML Schema, Presenting XML, Introduction to DOM and SAX parsers.

UNIT-IV: SERVLET PROGRAMMING

Introduction, servlet implementation, servlet configuration, servlet exceptions, servlet lifecycle, Requests and Responses: ServletRequest, ServletResponse, HttpServletRequest, HttpServletResponse interfaces, cookies, session creation and tracking using HttpSession interface.

UNIT-V: DATABASE PROGRAMMING WITH JDBC

Database drivers, the java.sql package: connection management, database access, data types, database metadata, exceptions and warnings, loading a database driver and opening connections, establishing a connection, creating and executing sql statements querying the database, prepared statements, mapping sql types to java, transaction support, save points.

UNIT-VI: INTRODUCTION TO JSP

Introducing JSP, JSP directives, scripting elements, standard actions, implicit objects, scope and JSP pages as XML documents, introduction to MVC architecture.

UNIT-VII: JSP TAG EXTENSIONS

Introduction to javabean, advantages of javabean, introspection**,** getter and setter methods, introduction to JSP tag extensions, a simple tag, anatomy of a tag extension, writing tag extensions.

UNIT-VIII: JSP APPLICATIONS WITH TAG LIBRARIES

Benefits of using custom tag libraries, introducing the JSP Standard Tag Library (JSPTL), getting started with the JSPTL, integrating the JSPTL into your JSP page, the JSPTL tags.

TEXT BOOKS:

1. Chris Bates, *Web Programming Building Internet Applications*, 2nd edition, Wiley-2007.
2. Subrahmanyam Allamaraju and Cedric Buest, *Professional Java Server Programming J2EE,* 1.3 Edition, SPD (apress)-2004.

REFERENCE BOOKS:

1. Dietel and Dietel, *Internet and World Wide Web, How to program,* 4 ed, Pearson Education
2. A. Watt and Jeff Rafter, *Beginning XML*, David Hunter, Wiley Dreamtech, 2004.
3. J. McGovern, Rahim Adatia and Yakov Fain, *J2EE 1.4 Bible*, Wiley Dreamtech, 2004.
4. Hans Bergsten, *Java Server Pages*, 2 ed, SPD O'Reilly.

IV B.Tech. I Semester

10BT70501: PRINCIPLES OF COMPILER DESIGN

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO COMPILERS

Definition of compiler, interpreter and its differences, The phases of a compiler, Role of lexical analyzer, Regular expressions, Finite automata, From regular expressions to finite automata, Pass and phases of translation, bootstrapping, LEX-lexical analyzer generator.

UNIT-II: PARSING

Parsing, Role of parser, Context free grammar, Derivations, Parse trees, Ambiguity, Elimination of left recursion, Left factoring, Eliminating ambiguity from dangling-else grammar, Classes of parsing, Top-down parsing– Backtracking, Recursive-descent parsing, Predictive parsers, LL(1) grammars.

UNIT-III: BOTTOM-UP PARSING

Definition of bottom-up parsing, Handles, Handle pruning, Stack implementation of Shift-Reduce parsing, Conflicts during Shift-Reduce parsing, LR grammars, LR parsers-Simple LR, Canonical LR and Look Ahead LR parsers, Error recovery in parsing, Parsing ambiguous grammars, YACC-automatic parser generator.

UNIT-IV: SYNTAX-DIRECTED TRANSLATION

Syntax directed definition, Construction of syntax trees, S-attributed and L-attributed definitions, Translation schemes, Emitting a Translation.

Intermediate Code Generation: Intermediate forms of source programs– Abstract syntax tree, Polish notation and Three address code, Types of three address statements and its implementation, Syntax directed translation into three-address code, Translation of simple statements, Boolean expressions and flow-of-control statements.

UNIT-V: TYPE CHECKING

Definition of type checking, Type expressions, Type systems, Static and dynamic checking of types, Specification of a simple type checker, Equivalence of type expressions, Type conversions, Overloading of functions and operators.

UNIT-VI: RUN TIME ENVIRONMENTS

Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing, Symbol tables, Language facilities for dynamic storage allocation.

UNIT-VII: CODE OPTIMIZATION

Organization of code optimizer, Basic blocks and flow graphs, Optimization of basic blocks, The principal sources of optimization, The DAG representation of basic block, Global data flow analysis.

UNIT-VIII: CODE GENERATION

Machine dependent code generation, Object code forms, The target machine, A simple code generator, Register allocation and assignment, Peephole optimization.

TEXT BOOK:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, *Compilers–Principles, Techniques and Tools*, Low price edition, Pearson Education, 2004.

REFERENCE BOOKS:

1. Alfred V. Aho, Jeffrey D. Ullman, *Principles of compiler design,* Indian student edition, Pearson Education, 2001.
2. Kenneth C. Louden, Thomson, *Compiler Construction– Principles and Practice*, 1 ed, PWS Publishing, 1997.
3. K.L.P Mishra and N. Chandrashekaran, *Theory of computer science- Automata Languages and computation,* 2 ed, PHI, 2003.
5. Andrew W. Appel, *Modern Compiler Implementation C*, Cambridge University Press, 2004.

IV B.Tech. I Semester

10BT70502: SOFTWARE TESTING TECHNIQUES

L	T	P	C
4	-	-	4

UNIT - I: INTRODUCTION AND THE TAXONOMY OF BUGS

Purpose of Testing, Some Dichotomies, A Model for Testing, The Consequences of Bugs, A Taxonomy for Bugs, Some Bug Statistics.

UNIT - II: FLOW GRAPHS AND PATH TESTING

Path-Testing Basics, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Implement and Application of Path Testing.

UNIT - III: TRANSACTION-FLOW TESTING AND DATA-FLOW TESTING

Transaction Flows, Transaction-Flow Testing Techniques, Dataflow Testing Basics, Data-Flow Testing Strategies, Application, Tools, Effectiveness.

UNIT - IV: DOMAIN TESTING

Domains and Paths, Nice & Ugly Domains, Domain Testing, Domains and Interfaces Testing, Domains and Testability.

UNIT - V: PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS

Path Products and Path Expressions, A Reduction Procedure, Applications, Regular Expressions and Flow-Anomaly Detection.

UNIT – VI: LOGIC BASED TESTING

Motivational Overview, Decision Tables, Path Expressions Again, KV Charts, Specifications.

UNIT - VII: STATES, STATE GRAPHS AND TRANSITION TESTING

State Graphs, Good State Graphs and Bad, State Testing, Testability Tips. Graph Matrices and Applications: Motivational overview, The Matrix of a Graph, Relations, The Powers of a Matrix, Node-Reduction Algorithm, Building Tools.

UNIT VIII: AN OVERVIEW OF SOFTWARE TESTING TOOLS

Overview of Win Runner and QTP Testing Tools for Functional / Regression Testing, Testing an Application Using Win Runner and QTP, Synchronization of Test Cases, Data-Driven Testing, Testing a Web Application.

TEXT BOOKS:

1. Boris Beizer, *Software Testing Techniques*, 2 ed, Dreamtech Press, 2004.
2. Dr. K.V.K.K. Prasad, *Software Testing Tools*, Dreamtech Press, 2005.

REFERENCE BOOKS:

1. William E. Perry, *Effective methods of Software Testing*, 3 ed, John Wiley Edition.
2. Meyers*, Art of Software Testing*, 2 ed, John Wiley.

IV B.Tech. I Semester

10BT71501: NETWORK PROGRAMMING

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO NETWORK PROGRAMMING

OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT-II: SOCKETS

Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets– Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT-III: TCP CLIENT SERVER

Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host, shutdown of server host.

UNIT-IV: I/O MULTIPLEXING AND SOCKET OPTIONS

I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option, IPV6 socket option and TCP socket options.

UNIT-V: ELEMENTARY UDP SOCKETS

Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT-VI: ELEMENTARY NAME AND ADDRESS CONVERSIONS

DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT-VII: IPC

Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores.

UNIT-VIII: REMOTE LOGIN

Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

TEXT BOOKS:

1. W.Richard Stevens, *UNIX Network Programming*, 2 ed, Vol. I, Sockets API, Pearson Education, Asia.
2. W.Richard Stevens, *UNIX Network Programming*, 1 ed, PHI.

REFERENCE BOOKS:

1. T. Chan, *UNIX Systems Programming using C++*, PHI, 2006.
2. Graham GLASS, King Abls, *UNIX for Programmers and Users*, 3 ed, Pearson Education.
3. M.J. Rochkind, *Advanced UNIX Programming*, 2 ed, Pearson Education.

IV B.Tech. I Semester

10BT71208: SOFTWARE PROJECT MANAGEMENT

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT – I: SOFTWARE EFFORTS ESTIMATION TECHNIQUES

The waterfall model, conventional software Management performance.

Evolution of software economics**:** Software Economics, pragmatic software cost estimation.

UNIT – II: IMPROVING SOFTWARE ECONOMICS

Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections, The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT – III: LIFE CYCLE PHASES

Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT – IV: MODEL BASED SOFTWARE ARCHITECTURES

A Management perspective and technical perspective.

Workflows of the process: Software process workflows, Iteration workflows.

UNIT – V: CHECKPOINTS OF THE PROCESS:

Major mile stones, Minor Milestones, Periodic status assessments. Iterative process planning**:** Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT – VI: PROJECT ORGANIZATIONS AND RESPONSIBILITIES

Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process automation: Automation Building blocks, The Project Environment.

UNIT – VII: PROJECT CONTROL AND PROCESS INSTRUMENTATION

The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the process: Process discriminants.

UNIT – VIII: NEXT GENERATION SOFTWARE ECONOMICS

Modern Project Profiles, Next generation Software economics, modern process transitions.

Case studies: The command Center Processing and Display system-Replacement (CCPDS-R), Process Improvement and Mapping to the CMM.

TEXT BOOK:

1. Walker Royce, *Software Project Management*, Pearson Education, 2005.

REFERENCE BOOKS:

1. Bob Hughes and Mike Cotterell, *Software Project Management*, Tata McGraw-Hill Edition, 2006.
2. Joel Henry, *Software Project Management*, Pearson Education, 2003.

IV B.Tech. I Semester

10BT70503: REAL TIME SYSTEMS DESIGN AND ANALYSIS

(ELECTIVE-I)

L	T	P	C
4	-	-	4

UNIT-I: BASIC REAL-TIME CONCEPTS

Terminology-Real Time System Design Issues-Example Real Time Systems-Brief History.

Hardware Considerations: Basic Architecture-Hardware Interfacing-Central Processing Unit-Memory-Input/Output-Enhancing Performance-Other Special Devices-Non-von-Neumann Architectures.

UNIT-II: REAL-TIME OPERATING SYSTEMS

Real-Time Kernels-Theoretical Foundations of Real-Time Operating Systems-Intertask Communication and Synchronization-Memory Management-Case Study: POSIX.

UNIT-III: SOFTWARE REQUIREMENTS ENGINEERING

Requirements-Engineering process-Types of Requirements-Requirements Specification for Real-Time Systems-Formal Methods in Software Specification-Structured Analysis and Design-Object-Oriented Analysis and the Unified Modeling Language-Requirements Validation and Review.

UNIT-IV: SOFTWARE SYSTEM DESIGN

Properties of Software-Basic Software Engineering Principles-The Design Activity-Procedural-Oriented Design-Object-Oriented Design.

UNIT-V: PROGRAMMING LANGUAGES AND THE SOFTWARE PRODUCTION PROCESS

Introduction, Assembly Language, Procedural Languages, Object Oriented Languages, Brief Survey of Languages, Coding Standards.

UNIT-VI: PERFORMANCE ANALYSIS AND OPTIMIZATION

Theoretical Preliminaries-Performance Analysis-Application of Queuing Theory-I/O Performance—Performance Optimization-Results from Compiler Optimization-Analysis of Memory Requirements-Reducing Memory Utilization.

UNIT-VII: ENGINEERING CONSIDERATIONS

Metrics-Faults, Failures, and Bugs-Fault-Tolerance-Systems Integration.

UNIT-VIII: CASE STUDY

Typical Real-Time Applications-Hard Versus Soft Real-Time Systems-Real-Time Communications.

TEXT BOOK:

1. Philip A.Laplante, *Real Time System Design and Analysis*, An engineer's handbook, Wiley-IEEE Press, 2004.

REFERENCE BOOKS

1. Jane W. S. Liu, *Real-Time Systems*, Pearson, 2000.
2. C.M.Krishna and Kang G Shin, *Real time systems*, TMH, 2008
3. Stuart Bennelt, *Real Time Computer Control – and Introduction*, Pearson education, 2003.
4. Allen Burns, Andy Wellings, *Real Time Systems and Programming Languages*, Pearson Education, 2003.

IV B.Tech. I Semester

10BT70504: **PARALLEL PROCESSING**

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION, MOTIVATION FOR PARALLELISM

Parallel Computing, Speed Up, Moore's Law, Grand Challenge Problems, Trends.

Parallel and Distributed Computers: Flynn's Taxonomy, Distributed Memory Multicomputers, Shared Memory Multiprocessors, Networks of Workstations, Cluster and Grid Computing.

UNIT II: MESSAGE PASSING COMPUTING

Process Creation, Message Passing Routines, Point-to-Point, Collective Communication.

MPI and PVM: MPI Model of Computation, Basic Concepts, Message Passing Routines, Point-to-Point, Collective Communication, Comparison of MPI and PVM.

UNIT III: PERFORMANCE MEASURES

Granularity, Speed Up, Efficiency, Cost, Amdahl's Law, Gustafson's Law, Isoefficiency.

Analysis of Parallel Programs: Parallel Computation Models, PRAM, Modeling Communication, Cluster Cost Model.

UNIT IV: PARALLEL PROGRAMMING TECHNIQUES

Introduction, Embarrassingly Parallel Computations: Low Level Image Processing, Mandelbrot Set, Monte Carlo Methods.

Simple Data Partitioning: Sum of Numbers, Bucket Sort, Numerical Integration, N-Body Problem.

Divide-and-Conquer: Sum of Numbers, Merge Sort, Adaptive Quadrature, Barnes-Hut Algorithm.

UNIT V: PIPELINED COMPUTATIONS

Type 1, 2 and 3 Pipelines, Sum of Sequence, Insertion Sort, Prime Number Generation, Back Substitution.

Scheduling and Load Balancing: List Scheduling, Static Load Balancing, Dynamic Load Balancing, Moore's Algorithm.

UNIT VI: SYNCHRONOUS COMPUTATIONS

Data Parallel Programming, Global and Local Synchronization, Solving Linear Equations, Cellular Automata.

Shared Memory Programming: Threads, Compiler Directives, OpenMP.

UNIT VII: APPLICATIONS

Sorting Algorithms: Rank Sort, Compare and Exchange, Bubble Sort, Quicksort, Bitonic Mergesort.

Numerical Algorithms: Matrix Algorithms, Solving Linear Equations, Gaussian Elimination; Jacobi Iteration.

UNIT VIII: FOURIER TRANSFORMS

Serial Algorithm, Binary Exchange Algorithm, Transpose Algorithm.

TEXT BOOK:

1. Barry Wilkinson and Michael Allen, *Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers,* 2 ed, Prentice Hall PTR, 2005.

REFERENCE BOOKS:

1. A. Grama, A. Gupta, G. Karypis and V. Kumar, *Introduction to Parallel Computing*, 2 ed, Addison Wesley 2002.
2. H. El-Rewini and T.G. Lewis, *Distributed and Parallel Computing*, Manning, 1997.
3. I. Foster, *Designing and Building Parallel Programs*, Addison Wesley 1995.
4. Kai Hwang and Zhiwei Xu, *Scalable Parallel Computing*, McGraw Hill, 1998.
5. Michael J. Quinn. *Parallel Programming in C with MPI and OpenMP*, McGraw Hill, 2003.

IV B.Tech. I Semester

10BT62301:**BIOINFORMATICS**

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT –I: INTRODUCTION TO BIOINFORMATICS

Internet basics, Scope of bioinformatics, elementary commands and protocols, ftp, telnet, http, primer on information theory, introduction to perl and bioperl.

UNIT –II: INTRODUCTION TO HOMOLOGY

Introduction to homology with special mention to Charles Darwin, Sir Richard Owen, Willie Henning, Alfred Russel Wallace.

UNIT –III: SPECIAL TOPICS IN BIOINFORMATICS

DNA mapping and sequencing, map alignment, large scale sequencing methods - shotgun and Sanger method. Linkage analysis - Map marker and Darwin.

UNIT –IV: SEQUENCE ALIGNMENT AND DYNAMIC PROGRAMMING

Heuristic alignment algorithms, global sequence alignments- needleman-Wunsch algorithm, local sequence alignments- smith-waterman algorithm, amino acid substitution matrices- PAM and BLOSUM.

UNIT –V: PRIMARY DATABASE AND THEIR USE

Introduction to biological databases - organization and management, searching and retrieval of information from the World Wide Web, Structure databases - PDB (Protein Data Bank), Molecular Modeling Databases (MMDB), primary databases- NCBI, EMBL, DDBJ.

UNIT –VI: SECONDARY DATABASES

Introduction to secondary databases- organization and management of databases Swiss-Prot, PIR, KEGG.

UNIT –VII: BIOCHEMICAL DATA BASES

Introduction to biochemical databases-organization and Management of databases. KEGG, ExPASy, BRENDA, WIT.

UNIT –VIII: EVOLUTIONARY TREES AND PHYLOGENY

Multiple sequence alignment and phylogenetic analysis.

TEXT BOOKS:

1. Hooman H. Rashidi and Lukas K. Buehler, *Bioinformatics Basics, Applications in Biological Science and Medicine,* 2 ed, CRC Press, Taylor and Francis Group, 2005.
2. Anna Tramantano, *Introduction to Bioinformatics,* 1 ed, Chapman and Hall / CRC Press, Taylor and Francis Group, 2001.

REFERENCE BOOKS:

1. David Mount, *Bioinformatics*, 2 ed, CSHL Press, 2005.
2. Editor: Sandor Suhai, *Genomics and Proteomics-Functional and Computational aspects,* 1 ed, Springer Publications, 2001.
3. Stephen Misener and Stephen A. Krawetz, *Bioinformatics-Methods and Protocols,* Human Press, 2003.
4. Andreas D. Baxevanis and B. F. Francis Ouellette, *Bioinformatics-A Practical guide to the Analysis of Genes and Proteins,* 3 ed, John Wiley and Sons, Inc, 2004.
5. Lan Korf, *Mark Yandell, Joseph Bedell, BLAST: An Essential guide,* O'Reilly publishers, 2005.

IV B.Tech. I Semester

10BT71221: **WEB MINING**

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Data Mining, Analytic Customer Relationship Management, Tasks of Data Mining, Study of Data Mining, Uses of Data Mining, The Virtuous Cycle of Data Mining, A Case Study in Business Data Mining, Virtuous Cycle, Data Mining in the Context of the Virtuous Cycle, Neural Networks and Decision Trees Drive SUV Sales.

UNIT-II: DATA PREPARATION FOR MINING-I

Data Mining Methodology and Best Practices, Methodology, Hypothesis Testing, Models, Profiling, and Prediction, Methodology Steps.

UNIT-III: DATA PREPARATION FOR MINING-II

Preparing Data for Mining, Data appearance, Constructing the Customer Signature, Exploring Variables, Deriving Variables, Examples of Behavior-Based Variables, The Dark Side of Data, Computational Issues.

UNIT-IV: CLASSIFICATION METHODS-I

Decision Trees, Classification, Scoring, Estimation, Finding the Splits, Growing the Full Tree, Measuring the Effectiveness Decision Tree, Tests for Choosing the Best Split, Pruning, Extracting Rules from Trees, Further Refinements to the Decision Tree Method, Alternate Representations for Decision Trees, Decision Trees in Practice.

UNIT-V: CLASSIFICATION METHODS-II

Nearest Neighbor Approaches, Memory Based Reasoning, Challenges of MBR, Case Study: Classifying News Stories, Measuring Distance, The Combination Function, Collaborative Filtering.

UNIT-VI: ASSOCIATION RULES MINING

Defining Market Basket Analysis, Association Rules, Appropriateness of Association Rule, Building Association Rules, Extending the Ideas, Sequential Analysis Using Association Rules, Link Analysis: Basic Graph Theory, A Familiar Application of Link Analysis, Hubs and Authorities in Practice, Case Study: Usage of Fax Machines, Segmenting Cellular Telephone Customers.

UNIT-VII: MINING TECHNIQUES

Automatic Cluster Detection: Searching for Islands of Simplicity, K-Means Clustering, Similarity and Distance, Data Preparation for Clustering, Other Approaches to Cluster Detection, Divisive Clustering, Evaluating Clusters, Case Study: Clustering Towns, Genetic Algorithms, Genetics on Computers, Representing Data, Case Study: Using Genetic Algorithms for Resource Optimization, Schemata: Genetic Algorithms, More Applications of Genetic Algorithms, Application to Neural Networks, Case Study: Evolving a Solution for Response Modeling, Beyond the Simple Algorithm.

UNIT-VIII: MINING TOOLS

Data Mining Using Familiar Tools, Occam's Razor, A Look at Data, Measuring Response, Multiple Comparisons, Chi-Square Test, An Example: Chi-Square for Regions and Starts, Data Mining and Statistics.

TEXT BOOK:

1. Michael Berry and Gordon Linoff, *Data Mining Techniques for Marketing*, *Sales, and Customer Relationship Management*, 2 ed, John Wiley, 2004.

REFERENCE BOOKS:

1. Ian Witten and Eibe Frank, *Data Mining: Practical Machine Learning Tools and Techniques*, 2 ed, Morgan Kaufmann, 2005.
2. Gordon Linoff and Michael Berry, *Mining the Web: Transforming Customer Data into Customer Value*, John Wiley & Sons, 2001.
3. Ralph Kimball and Richard Merz, *The Data Web house Toolkit*, John Wiley, 2000.

IV B.Tech. I Semester

10BT70505: SOFT COMPUTING

(ELECTIVE – II)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION

Introduction to Soft Computing, Soft Computing Constituents and Conventional AI, Soft Computing Characteristics.

Fuzzy Set Theory: Fuzzy Sets – Introduction, Basic Definition and Terminology, Set-theoretic Operations, MF Formulation and Parameterization.

UNIT II: FEED FORWARD NEURAL NETWORKS

Adaptive Networks: Introduction, Architecture, Back Propagation for Feed Forward Networks, Extension Back Propagation for Recurrent Networks, Hybrid Learning Rule: Batch Learning, Pattern by Pattern Learning, Different Ways of Combining Steepest Descent LSE, Counter Propagation Networks, Adaptive Resonance Theory Network, Radial Basis Function Network.

UNIT III: FEEDBACK NEURAL NETWORKS

Supervised Learning: Introduction, Perceptrons, Back Propagation Multilayer Perceptrons.

Unsupervised Learning: Introduction, Competitive Learning Networks, Kohonen Self-Organizing Networks, Learning Vector Quantization, Hebbaian Learning, The Hopfield Network.

UNIT IV: FUZZY RULES AND FUZZY REASONING

Introduction, Extension Principles and Fuzzy Relations, Fuzzy If-Then Rules, Fuzzy Reasoning.

Fuzzy Interference Systems: Introduction, Mamdani Fuzzy Models, Sugeno Fuzzy Models, Tsukamoto Fuzzy Models.

UNIT V: OPTIMIZATION AND GENETIC ALGORITHMS

Least Squares Methods for System Identification: Introduction, Basics of Matrix Manipulation and Calculus, Least Squares Estimator, Recursive Least Squares Estimator, Recursive LSE for Time Varying Systems.

Derivative-based Optimization: Introduction, Non-linear Least Squares Problems.

Derivative-Free Optimization: Introduction, Genetic Algorithms, Simulated Annealing (TSP), Random Search.

UNIT VI: NEURO FUZZY CONTROL

Neuro Fuzzy Control–I: Introduction, Feedback Control Systems and Neuro Fuzzy Control, Expert Control, Inverse Learning, Specialized learning, Back Propagation Through Time and Real Time Recurrent Learning.

Neuro Fuzzy Control–II: Introduction, Reinforcement Learning Control, Gradient-Free Optimization, Gain Scheduling.

UNIT VII: NEURO FUZZY MODELING

Adaptive Neuro-Fuzzy Interference Systems: Introduction, Architecture, Hybrid Learning Algorithm, Learning Methods that Cross-fertilize ANFIS and RBFN.

Coactive Neuro-fuzzy Modeling: Towards Generalized ANFIS-Introduction, Frame Work, Neuron Functions for Adaptive Networks, Neuro-Fuzzy spectrum.

Advanced Neuro Fuzzy Modeling: Classification and Regression Trees, Data Clustering Algorithms: Introduction, K-Means Clustering, Fuzzy C-Means Clustering.

UNIT VIII: ADVANCED APPLICATIONS

ANFIS Applications: Introduction, Printed Character recognition, Inverse Kinematics Problem, Automobile MPG Identification, Nonlinear System Identification, Channel Equalization.

Fuzzy Sets and Genetic Algorithms in Game Playing: Introduction, Variants of Genetic Algorithm, Using Genetic Algorithms in Game Playing, Simulation Results of the Basic Models, Using Fuzzily Characterized Features, Using Polyploid GA in Game Playing.

TEXT BOOK:

1. Jang J.S.R., Sun C.T. and Mizutani E, *Neuro-Fuzzy and Soft computing*, Prentice Hall, 2010.

REFERENCE BOOKS:

1. LiMin Fu, *Neural Networks in Computer Intelligence*, Tata McGraw-Hill, 1994.
2. Timothy J.Ross, *Fuzzy Logic with Engineering Applications*, McGraw-Hill, 1997.
3. Davis E.Goldberg, *Genetic Algorithms: Search, Optimization and Machine Learning*, Addison Wesley, N.Y., 1989.
4. S. Rajasekaran and G.A.V.Pai, *Neural Networks, Fuzzy Logic and Genetic Algorithms*, PHI, 2003.
5. James A. Freeman/David M.Skapura, *Neural Network Algorithms, Application and Programming Techniques*, 1 ed, Pearson Education.
6. Simson Haykin, *Neural Networks*, 2 ed, Pearson Education.

IV B.Tech. I Semester

10BT70506: EMBEDDED SYSTEMS

(ELECTIVE - II)

L	T	P	C
4	-	-	4

UNIT - I: EMBEDDED COMPUTING

Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples.

UNIT - II: THE 8051 ARCHITECTURE

Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/ Output, Interrupts.

UNIT - III: BASIC ASSEMBLY LANGUAGE PROGRAMMING CONCEPTS

The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.

UNIT - IV:

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.

UNIT - V: APPLICATIONS

Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication.

UNIT - VI: INTRODUCTION TO REAL-TIME OPERATING SYSTEMS

Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.

UNIT - VII: BASIC DESIGN USING A REAL-TIME OPERATING SYSTEM

Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.

UNIT - VIII: INTRODUCTION TO ADVANCED ARCHITECTURES

ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller.

TEXT BOOKS :

1. Wayne Wolf, *Computers as Components-principles of Embedded computer system design*, Elseveir, 2008.
2. Kenneth J.Ayala, *The 8051 Microcontroller*, 3 ed, Thomson.
3. David E. Simon, *An Embedded Software Primer*, Pearson Education, 1999.

REFERENCE BOOKS:

1. Labrosse, *Embedding System Building Blocks*, via CMP publishers, 2000.
2. Raj Kamal, *Embedded Systems*, TMH, 2004.
3. Ajay V Deshmukh, *Micro Controllers*, TMH, 2005.
4. Frank Vahid, Tony Givargis, *Embedded System Design*, John Wiley, 2002.
5. Raj Kamal, *Microcontrollers*, Pearson Education, 2005.

IV B.Tech. I Semester

10BT71222: SOFTWARE ARCHITECTURE

(ELECTIVE-II)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO SOFTWARE ARCHITECTURE

Introduction to Software Architecture, Status of Software Architecture, Architecture Business Cycle, Software Architectures Evolution. Software Processes and the Architecture Business Cycle, Features of Good Architecture.

UNIT-II: ARCHITECTURE STYLES

Pipes and Filters, Data Abstraction and Object Oriented organization, Even-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

UNIT-III: SHARED INFORMATION SYSTEMS

Database Integration, Interpretation in Software Development Environments, Architectural Structures for Shared Information Systems.

UNIT-IV: ARCHITECTURAL DESIGN GUIDANCE

Guidance for User Interface Architectures, Case Study in Inter-operability: World Wide Web.

UNIT-V: PATTERN TYPES

Architectural Patterns, Structural Patterns, Patterns for Distribution, Patterns for Interactive Systems.

UNIT-VI: FORMAL MODELS AND SPECIFICATIONS

Finalizing the Architectural of a Specific System, Architectural Styles, Architectural Design Space, Case Study: CORBA.

UNIT-VII: ARCHITECTURAL DESCRIPTION LANGUAGES (ADL)

Contemporary, ADL's today, Capturing Architectural Information in an ADL, Application of ADL's in system Development, Choosing an ADL, Example of ADL.

UNIT-VIII: REUSING ARCHITECTURAL ASSETS WITHIN AN ORGANIZATION

Creating Products and Evaluating a Product Line, Organizational Implications of a Product Line, Component Based Systems. Software Architectures in Figure Legacy Systems.

TEXT BOOKS:

1. Mary Show, David Garlan, *S/W Arch. Perspective: on an Emerging Discipline*, PHI, 1996.
2. Len Bass, Paul Elements, *Rick Kazman, Software Architecture in Practice*, PEA, 1998.

REFERENCE BOOKS:

1. Garmus, Herros, *Measuring the Software Process: A Practical Guide to Functional Measure*, PHI, 1996.
2. Florac, Carleton, *Meas. Software Process: Stat. Proce. Cont. for Software process Improvements*, PEA, 1999.
3. W.Humphery, *Introduction to Team Software Process*, PEA, 2002.
4. Peters, *Software Design: Methods and Techniques*, Yourdon, 1981.
5. Buschmann, *Pattern Oriented Software Architecture*, Wiley, 1996.
6. Gamma et al, *Design Patterns*, PEA, 1995.
7. Gamma, Shaw, *An Introduction to Software Architecture, World Scientific*, 1995.
8. Shaw, Gamma, *Software Architecture*, PHI, 1996.

IV B.Tech. I Semester

10BT70507: PATTERN RECOGNITION AND IMAGE PROCESSING

(ELECTIVE – II)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO PATTERN RECOGNITION AND MACHINE LEARNING

Paradigms, machine perception with an example, Pattern Recognition Systems, Sensing, Segmentation and grouping, feature extraction, classification, The design cycle, data collection, feature choice, model choice, training, evaluation, computational complexity, learning and adaptation, supervised learning, unsupervised learning.

UNIT-II: BAYES DECISION THEORY

Introduction, Bayesian decision theory, continuous features, two category classification, classifiers, discriminates, and Decision surfaces, multi category case, two category case, the Normal density, univariate density, multivariate density, discriminate functions for normal density.

UNIT-III: PARAMETRIC METHODS

Introduction, Maximum Likelihood estimation, Bayesian estimation, curse of dimensionality, over fitting, under fitting, computational complexity.

Non-parametric methods: Introduction, density estimation, Parzen Windows, kn nearest neighbor estimation, the nearest neighbor rule, metrics and nearest neighbor classification.

UNIT-IV: LINEAR DISCRIMINATE FUNCTIONS (LDF):

Introduction, Linear discriminant functions and decision surfaces, Generalized LDF, the Two-category linear separable case, non-separable behavior, minimizing the perceptron criterion function, Principle component analysis, fisher's linear discriminant, Introduction to support vector machines.

UNIT-V : CLUSTERING

Introduction, hierarchal clustering algorithms, partitional clustering algorithms, Mixture resolving and mode seeking algorithms, nearest neighbor clustering, DBSCAN, online clustering techniques, a comparison of techniques, clustering large data sets, applications.

UNIT-VI: IMAGE PROCESSING

Introduction, Fundamental steps in digital image processing, components of digital image processing, light and the electromagnetic spectrum, image sensing and acquisition, Image sampling and quantization, some basic relationship between pixels, linear and non-linear operations.

UNIT-VII: IMAGE ENHANCEMENT

Background, some basic gray level transformations, histogram processing, enhancement using arithmetic and logic operations,
Color image processing: Color fundamentals, color models, pseudo color image processing, basics of full color image processing, color transformations, smoothing and sharpening, color segmentation.

UNIT-VIII: IMAGE SEGMENTATION

Detection of discontinuities, edge linking and boundary detection, Thresholding, Region based segmentation, The use of motion in segmentations, Image segmentation using clustering.

TEXT BOOKS:

1. R. O. Duda, P.E. Hart and D. G. Stork, *Pattern Classification*, 2 ed, Wiley India, 2006.
2. Rafael C. Gonzalez and Richard E. Woods, *Digital Image Processing*, Second Edition, Pearson Prentice Hall, 2002.

REFERENCE BOOKS:

1. A K Jain, *Fundamentals of Digital Image Processing*, 1 ed, PHI.
2. M Anji Reddy, *Digital Image Processing*, B S Publications, 2006.
3. Earl Gose, Richard John Baugh Teve Jost, *Pattern Recognition and Image Analysis*, PHI 2004.

IV B.Tech. I Semester

10BT70508: MAINFRAME SYSTEMS

(ELECTIVE – II)

L	T	P	C
4	-	-	4

UNIT I: EVOLUTION OF MAINFRAME HARDWARE

Overview of Computer Architecture -Classification of Computers - micro, mini, mainframes and super computer - Mainframe computer-key features - benefits - Evolution of Mainframes - Different hardware systems.

UNIT II: MAINFRAMES OS AND TERMINOLOGY

Operating systems on mainframes, Batch processing vs. online processing - mainframe operating system. - evolution - concepts of Address space, Buffer management - Virtual storage - paging - swapping - Dataset management in mainframes.

UNIT III: Z/OS AND ITS FEATURES

Z-operating system (Z/OS) - Virtual storage - Paging process - storage Managers - Program execution modes - Address space - Multiple virtual system(MVS) , MVS address space, Z/OS address space - Dataset - sequential and partial dataset - Direct access storage device(DASD) -Access methods - Record formats - Introduction to virtual storage access methods(VSAM) - Catalog - VTOC.

UNIT IV: OVERVIEW OF JCL

Introduction to Job Control language - Job processing - structure of JCL statements - Various statements in JCL - JOB statement - EXEC statement - DD statement - JCL procedures and IBM utility programs.

UNIT V: OVERVIEW OF DB2

Introduction to DB2 – System Service component, Database Service component, Locking Service component, Distributed Data Facility Services component, Stored Procedure component, catalogs and optimizer.

DB2 Objects and Data Types - DB2 Objects Hierarchy, Storage groups, Database, Table space, Table, Index, Clustered index, Synonyms and aliases, Views, Data Types.(overview of relational databases).
DB2 SQL programming – Types of SQL statements, DCL, DDL, DML, SPUFI utility.
Embedded SQL programming – Host variable, DECLGEN utility, SQLCA, single/multiple row manipulation, cursors, scrollable cursors.

UNIT VI: COBOL PROGRAMMING-I
Introduction – History, evolution and Features, COBOL program Structure, steps in executing COBOL
Language Fundamentals – Divisions, sections, paragraphs, sections, sentences and statements, character set, literals, words, figurative constants, rules for forming user defined words, COBOL coding sheet.
Data division – Data names, level numbers, PIC and VALUE clause, REDEFINES, RENAMES and USAGE clause
Procedure Division – Input / Output verbs, INITIALIZE verb, data movement verbs, arithmetic verbs, sequence control verbs.

UNIT VII: COBOL PROGRAMMING-II
File processing – Field, physical / logical records, file, file organization (sequential, indexed and relative) and access mode, FILE-CONTROL paragraph, FILE SECTION, file operations.
File handling verbs – OPEN, READ, WRITE, REWRITE, CLOSE.
Table processing – Definition, declaration, accessing elements, subscript and index, SET statement, SEARCH verb, SEARCH ALL verb, comparison.
Miscellaneous verbs – COPY, CALL, SORT, MERGE, STRING, UNSTRING verbs.

UNIT VIII: MAINFRAME APPLICATION DEVELOPMENT GUIDELINES
COBOL coding standards, relation between a COBOL file handling program and JCL, Different types of ABEND codes, COBOL-DB2 program pre-compilation, DBRM (Database Request Module), Application plan/packages, program execution methods (EDIT JCL, foreground and background modes).

TEXT BOOKS:

1. Doug Lowe, *MVS JCL*, Mike Murach and Associates, 1994.
2. Gary DeWard Brown, *JCL Programming Bible (with z/OS),* 5 ed, Wiley India Dream Tech, 2002.

REFERENCE BOOKS:

1. z/OS V1R4.0 MVS JCL Reference found online at http://www-1.ibm.com/support/docview.wss?uid=pub1sa22759706
2. z/OS V1R1.0 MVS JCL Reference found online at http://publibz.boulder.ibm.com/cgibin/bookmgr_OS390/BOOKS/iea2b600/CCONTENTS
3. COBOL - Language Reference, Ver 3, Release 2, IBM Redbook.
4. COBOL - Programming Guide, Ver 3, Release 2, IBM Redbook.
5. Nancy Stern & Robert A Stern, *Structured Cobol Programming*, John Wiley & Sons, New York, 1973.
6. M.K. Roy and D. Ghosh Dastidar, *Cobol Programming*, Tata McGraw Hill, New York, 1973.
7. Newcomer and Lawrence, *Programming with Structured COBOL*, McGraw Hill Books, New York, 1973.
8. Craig S Mullins, *DB2 Developer's Guide*, Sams Publishing, 1992.
9. Gabrielle Wiorkowski & David Kull, *DB2 Design & Development Guide*, Addison Wesley, 1992.
10. C J Date & Colin J White, *A Guide to DB2*, Addison Wesley.
11. IBM Manual: DB2 Application Programming and SQL guide.
12. IBM Manual: DB2 SQL Reference.
13. DB2 Version 7 Information Center found online at http://publib.boulder.ibm.com/infocenter/db2v7luw/index.jsp

IV B.Tech. I Semester

10BT70511: SOFTWARE TESTING TECHNIQUES LAB

L	T	P	C
-	-	3	2

List of Practicals:

1. Generate meaningful Unit test cases for the Project module-wise and test them for defects, Identify the defects from the code and correct them. Try Identify the various unit test metrics studied already to identify module stability. Fill the unit test report supplied by the instructor.

2. Generate meaningful Integration test cases for the Project and test them for defects, Identify the defects and correct them. Try Identify the various Integration test metrics studied already to identify module stability. Fill the Integration test report supplied by the instructor.

3. Generate meaningful System test cases for the Project and test them for defects, Identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.

4. Generate meaningful User Acceptance cases for the Project and test them for defects, Identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.

5. Test the supplied project/Application through testing tool: WinRunner, by generating appropriate test cases.

6. Test the supplied project/Application through testing tool: LoadRunner by generating appropriate test cases.

7. Test the supplied project/Application through testing tool:Quick Test Professional by generating appropriate test cases.

TEXT BOOKS:

1. Dr. K.V.K.K. Prasad, *Software Testing Tools*, Dreamtech Press, 2007.
2. Boris Beizer, *Software Testing Techniques*, 2 ed, Dreamtech Press, 2003.
3. Myers and Glenford. J., *The Art of Software Testing*, John-Wiley & Sons, 1979.
4. Roger. S. Pressman, *Software Engineering–A Practitioner's Approach*, 5 ed, McGraw Hill, 2001.
5. Marnie. L. Hutcheson, *Software Testing Fundamentals*, Wiley-India, 2007.

POLICY

Unit Testing

In the V-model of software development, unit testing implies the first stage of dynamic testing process.It involves analysis of the written code with the intention of eliminating errors. It also verifies that thecodes are efficient and adheres to the adopted coding standards. Testing is usually white box. It is done using the Unit test design prepared during the module design phase. This may be carried out by software testers, software developers or both.

Integration Testing

In integration testing the separate modules will be tested together expose faults in the interfaces and in the interaction between integrated components. Testing is usually black box as the code is not directly checked for errors. It is done using the integration test design prepared during the architecture design phase. Integration testing is generally conducted by software testers.

System Testing

System testing will compare the system specifications against the actual system. The system test design derived from the system design documents and is used in this phase. Sometimes system testing is automated using testing tools. Once all the modules are integrated several erros may rise.Testing done at this stage is called system test.

User Acceptance Testing

Acceptance Testing checks the system against the requirements of the user. It uses black box testing using real data, real people and real documents to ensure ease of use and functionality of systems. Users who understand the business functions run the tests as given in the acceptance test plans, including installation and Online help. Hardcopies of user documentation are also being reviewed for usability and accuracy. The testers formally document the results of each test, and provide error reports, correction requests to the developers.

Lab Pre-requirements:

a. Software Project

b. Various test reports like

- Unit Testing reports
- Integration Testing reports
- System Testing reports
- User Acceptance Testing reports

c. Software development Environment like studio, eclipse etc.(where applications are developed)

d. Software Project documents like System requirement document, design document and any other project document for the case.

Test cases are to be generated manually and automated where ever required. The application to be used for this will be supplied in the department. The intention of the student will be to write the various types of test cases , find the defects from the product/ program supplied and fix the issues. Student needs to identify defects accordingly from the V-model of software development.

IV B.Tech. I Semester

10BT71211:**WEB PROGRAMMING LAB**

L	T	P	C
-	-	3	2

List of Practicals:

1. Design the following static web pages required for an online book store web site.

A. Home Page:

The static home page must contain the following three frames:

Top frame: Logo and the book store name and links to Home page, about us page, collections page, contact us page and cart page.

Left frame: At least four links for navigation, which will display the book catalogue of respective areas. For e.g.: when you click the link **"Computer"** the catalogue for computer books should be displayed in the right frame.

Right frame: The pages of the links in the left and top frame must be loaded here. Initially it will display the description of the web site, i.e., page of the Home link will be loaded.

<table>
<tr><td>Logo</td><td colspan="4">Name of the Book Store</td></tr>
<tr><td>Home</td><td>About Us</td><td>Collections</td><td>Contact Us</td><td>Cart</td></tr>
<tr><td>Computer
Electrical
Electronic
Bio-Tech</td><td colspan="3">Description of the Web Site</td><td>Sign In

New User?
Sign Up</td></tr>
</table>

B. Login Page:

The login page looks like as follows (Link this page to Sign In link):

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	User ID: Password: Submit Reset New User? Sign Up			

2. Design the following static web pages for an online book store web site.

A. Catalogue Page:

The catalogue page should contain the details of books available in the web site. The details are as follows:

a. Snap shot of cover page b. Text book name
c. Author name d. Publisher
e. Price f. Add to cart link.

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	Computer Books			

Cover Page	Book Details	Price	Remarks
	Book : XML Bible Author : Winston Publication : Wiley	INR 399.00	Add to Cart
	Book : Multimedia Author : Ze Nian Li Publication : Prearson	INR 455.00	Add to Cart
	Book : HTML Author : Watson Publication : SPD	INR 355.00	Add to Cart

B. Registration Page:

Design the Registration page with the following fields (Link this page to Sign Up link).

a. First Name
b. Last Name
c. User ID
d. Password
e. Confirm Password
f. Gender
g. Date of Birthh. Address
i. Postal Code
j. Linguistics
k. Mobile No.
l. Email-ID

C. Cart Page:

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	**Selected Books** Book Name XML bible 798.00 HTML 355.00 **Total amount (INR): 1153.00**	Price 399.00 355.00	Quantity 2 1	Amount INR INR

3. Write a JavaScript code to validate the following fields of the registration page.

a. First Name/Last Name - should contain only alphabets and the length should not be less than 3 characters.
b. User ID - It should contain combination of alphabets, numbers and _. It should not allow spaces and special symbols.
c. Password - It should not be less than 8 characters in length.

4. Write a JavaScript code to validate the following fields of the registration page.

a. Date of Birth - It should allow only valid date; otherwise display a message stating that entered date is invalid. Ex. 29 Feb. 2009 is an invalid date.
b. Mobile No. - It should allow only numbers and total number of digits should be equal to 10.

c. E-mail id - It should allow the mail id with the following format:
Ex. mailid@domainname.com

5. Apply the following styles to static pages of online book store web site using CSS (Cascading Style Sheets):

a. Fonts and Styles: font-family, font-style, font-weight and font-size
b. Backgrounds and colors: color, background-color, background-image and background-repeat
c. Text: text-decoration, text-transformation, text-align and text-indentation, text-align
d. Borders: border, border-width, border-color and border-style
e. Styles for links: A:link, A:visited, A:active, A:hover
f. Selectors, Classes and Layers.

6. Write an XML file which includes the following:

a. Title of the book
b. Author of the book
c. ISBN number
d. Name of the publisher
e. Edition
f. Price

i. Write a Document Type Definition (DTD) or XML Schema to validate the above XML file.
ii. Display the contents of the XML file with the following format using XSL.

The contents should be displayed in a table. The header of the table should be in color grey, and the author names should be displayed in red color, bold and capitalized. Use your own colors for remaining fields.

7. A. Deploy web pages of online book store web site using Apache Tomcat web server and then navigate them thorough the default port number of the tomcat web server.

B. Write a Java Servlet program for displaying the system date.

C. Write a Java Servlet program to red user name and his/her favorite color from the html form.

Display the name of the user in green color and set user favorite color as a background color to the web page.

8. Write a Java Servlet program to read the user id and password entered in the Login form and authenticate with the values (user id and passwords) available in the cookie and web.xml file. If he/she is a valid user (i.e., user id and password match) you should welcome him/her by user id otherwise you should display a message stating that you are not an authorized user. Use the following methods for storing user id's and passwords:

A. Using Cookes - Assume four user id's user1, user2, user3 and user4 and their passwords pwd1, pwd2, pwd3 and pwd4 respectively. Create four cookies on four user id's and passwords.
B. Initialization Parameters in web.xml - Store the user id's and passwords in the web.xml file and access them through the servlet by using the getInitParameters() method.

9. Write a Java Servlet or JSP to store user details (entered in the Registration Form) into the database using JDBC. Use any RDBMS as backend for storing user details.

10. Write a Java Servlet or JSP to authenticate the user by reading user id and password entered in the Login form. Compare User id and password values with user id's and passwords stored at database. If he/she is a valid user (i.e., user id and password match) you should welcome him/her by name (first name + last name), otherwise you should display a message stating that you are not an authorized user.

11. A. Write a Java program for storing books details like Name of the text book, author, publisher, edition and price into the database using JDBC. Store books in database based on the category (i.e., Computer/Electrical/Electronic/Bio-Tech).

B. Write a Java servlet or JSP for updating catalogue page to extract books details from the database and then display them in tabular format using JDBC.

12. HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalogue page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time (i.e., from different systems in the LAN using the IP-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated. Modify your catalogue and cart pages to achieve the above mentioned functionality using sessions.

IV B.Tech. I Semester

10BT7HS01: **PROFESSIONAL ETHICS**

(AUDIT COURSE)

L	T	P	C
-	3	-	-

UNIT-I: ENGINEERING ETHICS

Scope and aims of engineering ethics-Senses of Engineering Ethics-Variety of Moral Issues-Types of Inquiry- Moral Dilemmas,- Moral Autonomy- Kohlberg's Theory, Gilligan's theory, Consensus and Controversy.

UNIT-II: PROFESSIONAL IDEALS AND VIRTUES

Theories about virtues, professional responsibility, integrity, self-respect, sense of "responsibility". Self-Interest, Customs and Religion- Self-interest and ethical egoism, customs and ethical relativism, religion and divine command ethics. Use of ethical theories- resolving moral dilemmas and Moral leadership.

UNIT-III: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation- similarities to standard experiments, learning from the past and knowledge gained. Engineering as Responsible experiments-Conscientiousness. Moral autonomy and accountability, the challenger case.

UNIT-IV: RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty, Respect for authority, collective bargaining, confidentiality, conflict of interests, occupational crime. Rights of Engineers- Professional rights, whistle-blowing, The bart case, employee rights and discrimination.

UNIT-V: GLOBAL ISSUES

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Managers, Consultants and Leaders. Engineers as managers – Managerial ethics applied to engineering profession.

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, *Ethics in Engineering*, Tata McGraw-Hill, 3 ed, 2007.
2. Govindarajan M, Nata Govindarajan. M, Natarajan. S, Senthilkumar. V.S, *Engineering Ethics*, Prentice Hall of India, 2004.

REFERENCE BOOKS:

1. Dr. S. Kannan, K. Srilakshmi, *Human Values and Professional Ethics*, Taxmann Allied Services Pvt Ltd., 2009.
2. Edmund G seebauer and Robert L Barry, *Fundamental of Ethics for scientists and Engineers*, Oxford University Press, Oxford, 2001.
3. Charles F Fledderman, *Engineering Ethics*, Pearson education/ Prentice Hall, NewJercy, 2004 (Indian Reprint).

IV B.Tech. II Semester

10BT6HS01: MANAGEMENT SCIENCE

L	T	P	C
4	-	-	4

UNIT - I: INTRODUCTION TO MANAGEMENT

Concepts of management and organization - Nature and Importance of management - Evolution of management thought - Functions of management - Contributions of F.W. Taylor and Henri Fayol to the management - Systems approach to management - Managerial skills- Elements of corporate planning process - Environmental scanning - SWOT Analysis - Social responsibilities of management.

UNIT - II: DESIGNING ORGANIZATIONAL STRUCTURES

Basic concepts related to organization – Departmentation and decentralization - Types of organizations – Merits, demerits and adoptability to modern firms.

UNIT - III: OPERATIONS MANAGEMENT

Principles and types of plant layout - Methods of production - Forecasting - Forecasting methods - Work study - Basic procedure involved in method study and work measurement - Statistical quality control: Factors affecting quality - Quality control using control charts (simple problems) - Acceptance sampling.

UNIT - IV: MATERIALS MANAGEMENT

Materials management objectives – Inventory - Types of inventory– Safety stock - Classical EOQ model - Need for inventory control – EOQ simple problems - ABC analysis - Purchase procedure - Stores management.

Marketing: Functions of marketing - Marketing mix - Channels of distribution.

UNIT - V: HUMAN RESOURCES MANAGEMENT (HRM)

Nature and scope of HRM - HRD and personnel management and industrial relations - Functions of HRM - Role of HR Manager in an organization - Performance appraisal - Job evaluation and merit rating - Motivation - Importance of motivation - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

UNIT - VI: PROJECT MANAGEMENT (PERT/CPM)

Network analysis - Program evaluation and review technique (PERT)- Critical path method (CPM) - Identifying critical path - Probability of completing the project within given time - Project cost analysis - Project crashing (simple problems).

UNIT - VII: ENTREPRENEURSHIP

Introduction to entrepreneurship - Definition of an entrepreneur - Entrepreneurial traits - Entrepreneur vs. Manager - Entrepreneurial decision process - Role of entrepreneurship in economic development-Social responsibilities of entrepreneurs - Opportunities for entrepreneurs in India and abroad - Women as an entrepreneur.

UNIT - VIII: CONTEMPORARY MANAGEMENT PRACTICES

Basic concepts of Just-In-Time (JIT) system - Total quality management (TQM) - Value chain analysis - Enterprise resource planning (ERP) - Business process outsourcing (BPO) – Globalization-Management challenges - Intellectual property rights-Supply chain management - Role of information technology in managerial decision making.

TEXT BOOKS:

1. O.P. Khanna, *Industrial Engineering and Management,* Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management,* 6 ed, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement,* 12 ed, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6 ed, TMH, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2 ed, TMH, New Delhi.
4. Heinz Weihrich and Harold Koontz*, Management- A Global Perspective,*10 ed, McGraw-Hill International.

IV B.Tech. II Semester

10BT80501: COMPUTATIONAL INTELLIGENCE

(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT I: COMPUTATIONAL INTELLIGENCE AND KNOWLEDGE

Intelligent Agents in the world, Representation and Reasoning.

Representation and Reasoning Systems: Representation and Reasoning systems, semantics.

Using Definite Knowledge: Applications in natural language processing.

UNIT II: SEARCHING

Graph searching, A generic searching algorithm, blind search strategies, Heuristic search, Refinements to search strategies.

Representing Knowledge: Choosing a representation language, mapping from PBM to reorientation, Choosing an inference procedure.

UNIT III: KNOWLEDGE ENGINEERING

Knowledge based system Arch, Meta interpreters, Querying the user, explanation.

Beyond Definite Knowledge: Equality, integrity constraints, Complete Knowledge Assumption, Disjunctive Knowledge, Explicit Quantification, First-order predicate calculus, model logic.

UNIT IV: ACTIONS AND PLANNING

Representations of actions and change, Reasoning with world representation.

UNIT V: ASSUMPTION BASED REASONING

An assumption based reasoning framework, default reasoning, abduction, evidential and casual reasoning, algorithms for assumption based reasoning.

UNIT VI: USING UNCERTAIN KNOWLEDGE

Probability, independence assumptions.

UNIT VII: MAKING DECISIONS UNDER CERTAINTY AND LEARNING

Learning as the best representation, case based reasoning, learning as refining the hypothesis space.

UNIT VIII: LEARNING UNDER UNCERTAINTY BUILDING SITUATED ROBOTICS

Robotic systems, the agent function, designing robotics, uses of agent models, robot architecture, implementing a controller, robots modeling the world, reasoning in situation robots.

TEXT BOOK:

1. David Poole, Alan MackWorth and Randy Goebel, *Computational Intelligence-A Logical Approach*, Oxford University Press, 2008.

REFERENCE BOOKS:

1. Russel, S & Norvig, *Artificial Intelligence: A modern Approach*, Prentice hall, 2008.
2. N.J Nilsson, *Problem solving methods in Artificial Intelligence*, McGraw Hill, 2005.
3. N.J Nilsson, *Principles of Artificial Intelligence*, Morgan Kaufmann, 2005.

IV B.Tech. II Semester

10BT71202: MOBILE COMPUTING

(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT - I: MOBILE COMPUTING (MC)

Introduction, History, architecture, devices and applications, limitations.

Global System for Mobile Communications (GSM): Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT II: MEDIUM ACCESS CONTROL

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT III: WIRELESS LAN

Infrared vs. Radio transmission, Infrastructure and ad hoc networks, IEEE 802.11.

HyperLAN: Protocol architecture, physical layer, Channel access control sub-layer, MAC sub-layer, Information bases and networking Bluetooth: User scenarios, physical layer, MAC layer, networking, security, link management

UNIT IV: MOBILE NETWORK LAYER

Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT V: DATABASE ISSUES

Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT VI: DATA DISSEMINATION

Push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT VII: MOBILE ADHOC NETWORKS (MANETS)

Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

UNIT VIII: PROTOCOLS AND TOOLS

Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers) and J2ME.

TEXT BOOKS:

1. Rajkamal, *Mobile Computing*, 2 ed, Oxford University Press,2008.
2. Jochen Schiller, *Mobile Communications*, 2 ed, Low price edition Pearson Education, 2003.

REFERENCE BOOKS:

1. Stojmenovic and Cacute, *Handbook of Wireless Networks and Mobile Computing*, John Wiley, 2002.
2. Hansmann, Merk, Nicklous, Stober, *Principles of Mobile Computing*, 2 ed, Springer, 2003.

IV B.Tech. II Semester

10BT80502: HUMAN COMPUTER INTERACTION

(ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION

Importance of user Interface – definition, importance and benefits of good design, a brief history of Screen design.

UNIT II: THE GRAPHICAL USER INTERFACE

Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user interface-popularity, characteristics, Principles of user interface design.

UNIT III: DESIGN PROCESS

Human interaction with computers, importance of human characteristics, human consideration in design, Human interaction speeds, Understanding business functions.

UNIT IV: SCREEN DESIGNING

Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT V: WINDOWS

System menus and Navigation schemes, selection of window, selection of devices based controls and screen based controls, organize and layout windows and web pages, Touch screen and surface computing.

UNIT VI: COMPONENTS

Text and messages, Icons and images, Multimedia.
Colours - uses, problems with colours, choosing colours.

UNIT VII: SOFTWARE TOOLS

Specification methods-Grammars, Menu-Selection and Dialog-box trees, Transition diagrams, State charts, Interface Building Tools-Interface mockup tools, Software-engineering tools.

UNIT VIII: INTERACTION DEVICES

Keyboard and function keys – pointing devices – speech recognition, digitization and generation, image and video displays.

TEXT BOOKS:

1. Wilbert O Galitz, *The Essential Guide to user Interface Design*, 2 ed, Wiley India Education.
2. Ben Shneidermann, *Designing the user interface*, 3 ed, Pearson Education Asia.

REFERENCE BOOKS:

1. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Rssell Bealg, *Human Computer Interaction*, 3 ed, Pearson, 2004.
2. Preece, Rodgers, Sharps, *Interaction Design*, 3 ed, Wiley Dreamtech, 2011.
3. Soren Lauesen, *User Interface Design*, Pearson Education, 2005.

IV B.Tech. II Semester

10BT81221: ADHOC WIRELESS NETWORKS

(ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Fundamentals of wireless communication technology, The electromagnetic spectrum, Radio propagation mechanisms, Characteristics of wireless channels, Modulation techniques, Multiple access techniques, Voice coding, Error control, IEEE 802 networking standard.

UNIT-II: ISSUES IN ADHOC WIRELESS NETWORKS

Introduction, Issues in Adhoc wireless Networks, MAC layer issues, Network layer issues, Multicasting issues,Transport layer issues and other issues, Adhoc wireless Internet.

UNIT-III: DESIGN GOALS OF MAC PROTOCOLS

Issues in designing a MAC Protocol, Classification of MAC protocol, Contention Based protocols: MACAW, BTMA, MARCH, Contention based protocols with reservation: CATA, SRMA/PR and contention based MAC protocols with scheduling mechanisms: DLBPS, Other protocols: Directional MAC Protocols, multichannel Protocol.

UNIT-IV: ROUTING PROTOCOLS FOR ADHOC WIRELESS NETWORKS:

Introduction, Issues in Designing a Routing Protocol for Adhoc Wireless Network, Classification of Routing protocols, Table-Driven Routing protocols: DSDV, CGSR, On-Demand Routing Protocols: DSR, AODV, TORA, Hybrid Routing protocols: CEDAR, ZR.

UNIT-V: MULTICAST ROUTING IN ADHOC WIRELESS NETWORKS

Introduction, Issues in Designing a Multicast Routing protocol, Operation of Multicast Routing protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing protocols, Tree - Based Multicast Routing protocols: BEMRP, MZRP, MCEDAR, MAODV, ASTMRP, Mesh-Based Multicast Routing Protocols: ODMRP, DCMP, NSMP.

UNIT-VI: TRANSPORT LAYER AND SECURITY PROTOCOLS FOR ADHOC WIRELESS NETWORKS

Introduction, Issues in Designing a Transport Layer Protocol for Adhoc wireless networks, Design Goals of a Transport Layer Protocol for Adhoc wireless Networks, Classification of Transport Layer Solutions, TCP over Adhoc wireless networks, Other Transport Layer Protocols for Adhoc wireless Networks.

UNIT-VII: QUALITY OF SERVICE(QOS)

Introduction, Issues and Challenges in providing QOS in Adhoc wireless networks, Classification of QOS Solutions, Mac Layer Solutions, Network Layer Solutions, QOS Frame work for Ad hoc wireless networks.

UNIT-VIII: SECURITY IN ADHOC WIRELESS NETWORKS

Network Security Requirements, Issues and challenges in Security Provisioning, Network Security Attacks, Key management, Secure Routing in Adhoc wireless Networks.

TEXT BOOK:

1. C. Siva Ram Murthy, B.S. Manoj, *Adhoc Wireless Networks-Architectures and Protocols*, Pearson Education, Delhi, 2005.

REFERENCE BOOKS:

1. C.K. Toh, *Adhoc Mobile Wireless Networks Protocols and Systems*, Pearson Education, 2007.
2. William Stalling, *Wireless Communications and Networks*, 2 ed, Pearson Education, India.
3. Jochen Schiller, *Mobile Communications*, 2 ed, Pearson Education.
4. Ivan Stojmenovic, *Handbook of Wireless Networks and Mobile Computing*, John Wiley & Sons Inc, Canada, 2002.

IV B.Tech. II Semester

10BT80503: ENTERPRISE APPLICATIONS

(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION

Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications.

UNIT II: ENTERPRISE APPLICATIONS

Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation.

UNIT III: ARCHITECTURE

Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture - design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations.

UNIT IV: ARCHITECTURE AND DESIGN ELEMENTS

Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design.

UNIT V: CONSTRUCTION READINESS OF ENTERPRISE APPLICATIONS

Defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment.

UNIT VI: SOFTWARE CONSTRUCTION MAPS

Introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis–code profiling and code coverage.

UNIT VII: TESTING AN ENTERPRISE APPLICATIONS

Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.

UNIT VIII: BUSINESS LOGIC

The Façade Pattern, The UserManager, State Design.
Messaging and Packaging: Messaging on the Server, Messaging on the Client, Packaging.

TEXT BOOKS:

1. Anubhav Pradhan, Satheesha B. Nanjappa, Senthil K. Nallasamy, Veerakumar Esakimuthu, *Raising Enterprise Applications*, Published by John Wiley, 2010.
2. Brett McLaughlin, *Building Java Enterprise Applications*, Published by O'Reilly Media, 2002.

REFERENCE BOOKS:

1. *Software Requirements: Styles & Techniques* – published by Addison-Wesley Professional, 2002.
2. *Software Systems Requirements Engineering: In Practice* – published by McGraw-Hill/Osborne Media, 2009.
3. Managing Software Requirements: A Use Case Approach, 2 ed, published by Pearson
4. *Software Architecture: A Case Based Approach* – published by Pearson, 2009.
5. Designing Enterprise Applications with the J2EE Platform (PDF available at- http://java.sun.com/blueprints/guidelines/designing_enterprise_applications_2e/)
6. Software Testing, 2 ed – published by Pearson.
7. Software Testing Principles and Practices – published by Oxford University Press, 2010.

IV B.Tech. II Semester

10BT81222: HIGH SPEED NETWORKS

(ELECTIVE – IV)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION

Protocols and the TCP/IP suite, High speed networks-Frame Relay, Asynchronous transfer mode, High speed LANs.

UNIT II: CONGESTION AND TRAFFIC MANAGEMENT

Congestion Control in Data Networks and Internets, Link-Level Flow and Error Control, TCP Traffic Control, Traffic and Congestion Control in ATM Networks.

UNIT III: INTERNET ROUTING

Overview of Graph Theory and Least-Cost Paths, Interior Routing Protocols, Exterior Routing Protocols and Multicast.

UNIT IV: QUALITY OF SERVICE IN IP NETWORKS

Integrated and Differentiated Services, Protocols for QoS Support

UNIT: V: COMPRESSION

Overview of Information Theory, Lossless Compression, Lossy Compression.

UNIT: VI: ASYNCHRONOUS TRANSFER MODE NETWORKS

ATM Protocol Architecture, ATM Adaptation Layer fast Packet Switching techniques and VC/VP encapsulation, Source Characteristics.

UNIT: VII: ATM TRAFFIC MANAGEMENT

Traffic management issues in ATM-resource management, Connection management, Policing and reactive control principles, Discrete time queue analysis and application to CAC, Leaky bucket and ECN/ICN.

UNIT: VIII: ATM SIGNALING AND DATA COMMUNICATION OVER ATM

ATM Signaling fundamentals and Meta Signaling, TCP/IP over ATM, Challenges and Proposals, LAN emulation over ATM , Performance of data communication over ATM.

TEXT BOOKS:

1. William Stallings, *High Speed Networks and Internet*, 2 ed, Pearson Education.
2. R.O Onvural, *Asynchronous Transfer Mode Networks– Performance Issues*, 2 ed, Artech House, 1995.

REFERENCE BOOKS:

1. W.Stallings, *High speed networks, TCP/IP and ATM design Principles*, 2 ed, PHI.
2. W.Stallings, *ISDN-B ISDN with frame relay and ATM*,PHI, 1998.
3. Behrouz A. Forouzan, *Data communication and Networking*, Tata McGraw-Hill, 2004
4. A.S.Tanenbaum, *Computer Networks*, 4 ed, Pearson Education/ PHI.

IV B.Tech. II Semester

10BT71504: NETWORK MANAGEMENT

(ELECTIVE-IV)

L	T	P	C
4	-	-	4

UNIT-I: DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW

Analogy of Telephone Network Management, Communication Protocols and Standards, Case Histories on Networking and Management, Network Management Functions, Network and System Management.

UNIT-II: BASIC FOUNDATIONS

Standards, Models, and Language, Network Management Standards, Network Management Models, Organization Model, Information Model, Communication Model, Functional Model, Network Management Applications, Abstract Syntax Notation One: ASN.1, Encoding Structure.

UNIT-III: SNMPV1 NETWORK MANAGEMENT

History of SNMP Management, Internet Organizations and Standards, SNMP Model, Organization and Information Models, Communication and Functional Models.

UNIT-IV: SNMPV2 NETWORK MANAGEMENT

SNMPv2, Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

UNIT-V: SNMPV3 NETWORK MANAGEMENT

SNMPv3, SNMPv3 Key Features, SNMPv3 Documentation Architecture, SNMPv3 Applications, SNMPv3 Management Information Base, SNMPv3 User-based Security Model, Access Control.

UNIT-VI: REMOTE MONITORING

RMON, Remote Monitoring, RMON SMI and MIB, RMON1, RMON2, A Case Study on Internet Traffic Network management tools, systems and engineering.

UNIT-VII: TELECOMMUNICATIONS MANAGEMENT NETWORK

TMN Conceptual model, TMN standards, TMN Architecture, TMN implementation, Network Management Applications.

UNIT-VIII: BROADBAND NETWORK MANAGEMENT

WAN, Wired and optical access Networks, advanced management topics. Distributed Network Management, Reliable and Fault Tolerant Network Management.

TEXT BOOK:

1. Mani Subramanian, *Network Management: Principles and Practice*, Pearson education, 2010.

REFERENCE BOOKS:

1. William Stallings, *SNMP, SNMPv2, SNMPv3, AND RMON 1 and 2*, 3 ed, Addison- Wesley, 1999.

2. Morris, *Network management*, Pearson Education 2006.

3. Mark Burges, *Principles of Network System Administration*, Wiley Dreamtech, 2008.

4. Paul, *Distributed Network Management*, John Wiley,2000.

IV B.Tech. II Semester

10BT80504: CLOUD COMPUTING

(ELECTIVE – IV)

L	T	P	C
4	-	-	4

UNIT- I: INTRODUCTION TO CLOUD COMPUTING

The History and Future of Cloud, Cloud Computing Basics, Overview of Cloud Computing- Components, Infrastructure and Services, Usage of Cloud Computing, Benefits and Limitations, Cloud Infrastructure Models, Cloud computing protocols and On-Demand services.

UNIT- II: CLOUD COMPUTING ARCHITECTURE

Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, Distributed Computing and Cloud Application Architectures.

UNIT- III: INTRODUCTION TO VIRTUALIZATION

History of virtualization, objectives of virtualization, benefits of virtualized technology, the virtual service desk, related forms of computing, virtualization processes.

UNIT- IV: VIRTUALIZATION TECHNOLOGIES

VMware, Microsoft Hyper-V, Virtual Iron, Xen, Ubuntu (Server Edition), Software Virtualization, Para Virtualization, OS Virtualization, Oracle Virtualization, Storage Virtualization Technologies, Virtualization and Storage Management.

UNIT- V: SECURITY

Security issues in Cloud Computing - Data Security, Network Security, and Host Security.

UNIT – VI: DISASTER RECOVERY

Disaster Recovery Planning, Disasters in the Cloud, Disaster Management. Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale.

UNIT – VII: GRAPH REDUCTION

Introduction, Types of Graphs, Examples, Representation and Application.

UNIT – VIII: CASE STUDIES

Google APP Engine, Yahoo Hadoop, OBIEE and Windows Azure.

TEXT BOOKS:

1. George Reese, *Cloud Application Architectures Building Applications and Infrastructure in the Cloud*, O'Reilly Media Released, April 2009.
2. Ivanka Menken and Gerard Blokdijk, *Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book*, Emereo Pvt Ltd, April 2009.

REFERENCE BOOKS:

1. Rajkumar Buyya, James Broberg and Andrzej Goscinski, *Cloud computing principles and Paradigms*, John Wiley and sons, 2011.
2. Michael Miller, *Cloud Computing*, 1 ed, Dorling Kindersley India, 2009
3. Danielle Ruest, *Virtualization: A Beginner's Guide*, 1 ed, MHE, 2009
4. Barrie Sosinsky, *Cloud Computing bible*, Wiley India Pvt Ltd, 2011.

IV B.Tech. II Semester

10BT4EC01: OPTIMIZATION TECHNIQUES

(ELECTIVE-IV)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION TO OPTIMIZATION TECHNIQUES

Statement of an optimization problem, design vector, design constraints, constraint surface, objective function, objective function surfaces, classification of optimization problems.

UNIT II: CLASSICAL OPTIMIZATION TECHNIQUES

Single variable optimization, multi variable optimization without constraints, necessary and sufficient conditions for minimum/ maximum, multivariable optimization with equality constraints, solution by method of lagrange multipliers, multivariable optimization with inequality constraints, Kuhn – Tucker conditions.

UNIT III: INTRODUCTION TO LINEAR PROGRAMMING

Standard form of a linear programming problem, geometry of linear programming problems, definitions and theorems, solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations, motivation to the simplex method, simplex algorithm, big M-method, dual simplex algorithm.

UNIT IV: TRANSPORTATION PROBLEM AND CONVEX PROGRAMMING

Finding initial basic feasible solution by North–West corner rule, least cost method and Vogel's approximation method, Assignment problems, variants, Integer Programming, Branch and bound technique, Convex programming.

UNIT V: UNCONSTRAINED NONLINEAR PROGRAMMING:

One–dimensional minimization methods: Classification, Fibonacci method, Problems and Quadratic interpolation method, Problems.

UNIT VI: UNCONSTRAINED OPTIMIZATION TECHNIQUES

Univariate method, Problems, Powell's Method, Conjugate directions, Algorithms, Problems, Steepest Descent (Cauchy) Method, Problems.

UNIT VII: CONSTRAINED NONLINEAR PROGRAMMING

Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods.

UNIT VIII: DYNAMIC PROGRAMMING

Dynamic programming, multistage decision processes, types, concept of sub optimization and the principle of optimality, computational procedure in dynamic programming, examples illustrating the calculus method of solution, examples illustrating the tabular method of solution.

TEXT BOOKS:

1. S. S. Rao, *Engineering optimization: Theory and practice*, 3 ed, New Age International (P) Limited, 1998.
2. Dr. S.D. Sharma, *Operations Research*, Kedarnath Ram Nath and Co. Publications, Meerut, 2003.

REFERENCE BOOKS:

1. H.A. Taha, *Operations Research: An Introduction*, 6 ed, PHI Pvt. Ltd.
2. Kanthi Swaroop, Gupta and Mohan, *Introduction to Operations Research,* 2006.

IV B.Tech. II Semester

10BT80505: C # AND .NET FRAMEWORK

(ELECTIVE-IV)

L	T	P	C
4	-	-	4

UNIT I: C# LANGUAGE FUNDAMENTS

Basic class, constructors, composing an application, variable scope, input and output with Console Class, value types, reference types, System .Object, system data types, Boxing and Unboxing, constants, iteration constructs, flow constructs, operators, class methods, static methods, modifiers, arrays, strings, enumerations, structures, name spaces.

UNIT II: OBJECT ORIENTED PROGRAMMING WITH C#

Definition of a class, default public interface, encapsulation, read only fields, inheritance support, protected keyword, nested type definitions, polymorphism, type casting, class definitions.

UNIT III: EXCEPTIONS AND OBJECT LIFETIME

Errors, bugs, exceptions, System.Exception, throwing, Catching, System.SystemException, System.ApplicationException, handling multiple exceptions, finally, last change system level exceptions, debugging system exceptions, object life time, garbage collection, finalization, destruction method, system.GC type.

UNIT IV: INTERFACES AND COLLECTIONS, CALLBACK INTERFACES, DELEGATES AND EVENTS

Defining, invoking, exercising hierarchy, interface implementation, building interface hierarchies, understanding Iconvertible interface, custom enumerator, Icloneable, Icomparable, System.Collections, callback interfaces, System.MulticastDelegate, examples, asynchronous delegates, understanding events.

UNIT V: .NET ASSEMBLY, PROCESSES, APPDOMAINS, CONTEXTS AND THREADS

Overview of .Net assembly, cross language inheritance, multi-file assembly, private assembly, XML configuration files, shared assemblies, strong names.

Process and threads, interaction with process, system.AppDomain, summarizing processes, AppDomains, and Context, multi thread programming via Delegates, spanning secondary threads, examples, concurrency, lock key word, System.Threading.Interlocked type, timer call backs.

UNIT VI: OBJECT SERIALIZATION AND .NET REMOTING LAYER

Object graphs, serialization using binary formatter, SOAP formatter, XML formatter, .Net remoting, object marshaling, MBR objects, MBV objects, asynchronous remoting, OneWayAttribute.

UNIT VII: WINDOWS FORMS, WINDOWS FORM CONTROLS

System.Windows.Forms, interactions with Windows Forms types, System.Windows.Forms.Application, component class, control class, control events key board events, ScrollableControl class, ContainerControl Class, Form class, Life-Cycle, handling form events, Menus with Windows Forms, status bars, tool bar, MDI application, Windows Forms Control Hierarchy, Controls to Forms, Text box control, check boxes, RadioButtons, GroupBoxes, ListBoxes, ComboBoxes, MonthCalendar Control, TrackBar, Panel controls, Dialog Boxes, Form Inheritance.

UNIT VIII: DATA ACCESS WITH ADO .NET

ADO.Net, Data providers, System.Data, DataColumn Type, DataRow Type, DataTable, DataView, DataSet, DataRelation, XML Based DataSet, Selecting a data provider, System.Data.OleDb Namespace, OleDbDataReader, Insertion, Updation and Deletion of records, stored procedures, OleDbDataAdapter, Example.

TEXT BOOK:

1. Andrew Troelsen, *C# and the .NET Platform*, APress, 2003.

REFERENCE BOOKS:

1. E. Balagurusamy, *Programming in C#*, Tata McGraw-Hill, 2004.
2. Herbert Schildt, *The Complete Reference: C#*, Tata McGraw-Hill, 2004.
3. Robinson et al, *Professional C#*, 2 ed., Wrox Press, 2002.
4. J. Liberty, *Programming C#*, 2 ed., O'Reilly, 2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (yearly pattern)

Computer Science & Systems Engineering

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT1BS04	Mathematical Methods	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics and Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language and Communication skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering and IT workshop	-	-	3	4	25	50	75
	TOTAL	**15**	**6**	**15**	**50**	**305**	**670**	**975**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

REGULATIONS: 2010-2011

DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS ENGINEERING

II B.Tech I Semester

Subject Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT3BS01	Probability and Statistics	4	1	-	4	30	70	100
10BT30421	Electronic Devices and Circuits	4	1	-	4	30	70	100
10BT30222	Foundations of Electrical Engineering	4	1	-	4	30	70	100
10BT30422	Digital Logic Design	4	1	-	4	30	70	100
10BT30501	Discrete Mathematical Structures	4	1	-	4	30	70	100
10BT30502	Data Structures	4	1	-	4	30	70	100
10BT30431	Analog and Digital Electronics Lab	-	-	3	2	25	50	75
10BT30511	Data Structures Lab	-	-	3	2	25	50	75
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

II B.Tech II Semester

Subject Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT3BS02	Environmental Sciences	4	1	-	4	30	70	100
10BT40501	Computer Architecture and Organization	4	1	-	4	30	70	100
10BT50501	Design and Analysis of Algorithms	4	1	-	4	30	70	100
10BT4EC01	Optimization Techniques	4	1	-	4	30	70	100
10BT50502	Micro-Processors and Interfacing	4	1	-	4	30	70	100
10BT40502	Object Oriented Programming	4	1	-	4	30	70	100
10BT40511	Object Oriented Programming Lab	-	-	3	2	25	50	75
10BT50511	Micro-Processors and Interfacing Lab	-	-	3	2	25	50	75
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III B.Tech I Semester

Subject Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT4HS01	Managerial Economics and Principles of Accountancy	4	1	-	4	30	70	100
10BT60501	Theory of Computation	4	-	-	4	30	70	100
10BT50503	Database Management Systems	4	1	-	4	30	70	100
10BT50504	Operating Systems	4	-	-	4	30	70	100
10BT51501	System Software	4	1	-	4	30	70	100
10BT51502	Object Oriented Software Engineering	4	1	-	4	30	70	100
10BT51511	Operating Systems and System Software Lab	-	-	3	2	25	50	75
10BT50512	Database Management Systems Lab	-	-	3	2	25	50	75
10BT4HS02	Advanced English Communication Skills	-	2	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III B.Tech II Semester

Subject Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT70501	Principles of Compiler Design	4	1	-	4	30	70	100
10BT40503	Principles of Programming Languages	4	1	-	4	30	70	100
10BT51202	Computer Graphics	4	1	-	4	30	70	100
10BT71201	Web Programming	4	1	-	4	30	70	100
10BT61202	Computer Networks	4	1	-	4	30	70	100
10BT61501	Modeling and Simulation	4	1	-	4	30	70	100
10BT61511	Complier Design and Computer Networks Lab	-	-	3	2	25	50	75
10BT61512	OOAD and Web Programming Lab	-	-	3	2	25	50	75
10BT61513	Seminar	-	-	-	2	75	-	75
	TOTAL	**24**	**6**	**6**	**30**	**305**	**520**	**825**

IV B.Tech I Semester

Subject Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal	External	Total
10BT71501	Network Programming	4	1	-	4	30	70	100
10BT71502	Soft Computing Techniques	4	1	-	4	30	70	100
10BT60503	Data Warehousing and Data Mining	4	1	-	4	30	70	100
10BT71503	Artificial Intelligence	4	1	-	4	30	70	100
10BT71504 10BT71207 10BT71222 10BT71505 10BT71506	**Elective – I:** 1. Network Management 2. Advanced Databases 3. Software Architecture 4. Distributed Operating Systems 5. Middleware Technologies	4	-	-	4	30	70	100
10BT71507 10BT71508 10BT71208 10BT71204 10BT71509	**Elective – II:** 1. Pattern Recognition 2. Embedded Computing Systems 3. Software Project Management 4. Cryptography and Network Security 5. Advanced Computer Architecture	4	-	-	4	30	70	100
10BT71511	Data Warehousing and Data Mining Lab	-	-	3	2	25	50	75
10BT71512	Network Programming Lab	-	-	3	2	25	50	75
10BT71513	Mini Project	-	-	-	2	25	50	75
10BT7HS01	Professional Ethics (Audit Course)	-	2	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**30**	**255**	**570**	**825**

IV B.Tech II Semester

Subject Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Sessional Exam	External Exam	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
10BT70402 10BT60405 10BT70502 10BT81221 10BT81207	**Elective – III:** 1. Digital Image Processing 2. VLSI Design 3. Software Testing Techniques 4. Ad-hoc Wireless Networks 5. Wireless Networks	4	-	-	4	30	70	100
10BT81501 10BT71202 10BT81502 10BT81503 10BT71203	**Elective – IV:** 1. Embedded Processors 2. Mobile Computing 3. Software Reengineering 4. Grid Computing 5. Multimedia and Applications Development	4	-	-	4	30	70	100
10BT81511	Comprehensive Viva Voce	-	-	-	2	100	-	100
10BT81512	Project	-	-	12	12	75	150	225
	TOTAL	12	-	12	26	265	360	625

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for Q(x)=e ax, sin ax, cos ax, xn, e ax V(x), x V(x) and xn V(x). Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1BS04: MATHEMATICAL METHODS

(Common to CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT–I

Matrices and Linear System of Equations : Rank of a matrix, echelon form, normal form, inverse of a matrix by normal form. Homogenous and non-homogenous linear systems, consistency and solutions of linear system of equations. Direct methods, Gauss elimination method, Gauss Siedel, Gauss Jordan method, factorization method.

UNIT-II

Eigen Values and Eigen Vectors : Definitions, evaluation of eigen values, eigen vectors and properties. Cayley Hamilton theorem (without proof), inverse and powers of a matrix by Cayley Hamilton theorem, diagonalization of a matrix, quadratic forms and reduction to its normal form (problems dealing with distinct eigen values only).

UNIT-III

Algebraic, Transcendental Equations and Curve Fitting: Solutions of algebraic and transcendental equations by bisection method, false position method, Newton-Raphson's method, iterative method. Curve fitting by the principle of least squares, fitting of a straight line, parabola, exponential and power curves.

UNIT-IV

Interpolation: Interpolation, forward difference operator, backward difference operator, central difference operator, relationship between operators, Newton's forward formula, Newton's backward formula, Gauss forward formula, Gauss backward formula, Lagranges interpolation formula.

UNIT-V

Numerical Differentiation and Integration: Numerical values of derivatives using Newton's forward formula, Newton's backward formula.

Numerical Integration: Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule.

UNIT-VI

Numerical Solutions of Ordinary Differential Equations: Numerical solutions of ordinary differential equations using Taylor series, Euler's method, modified Euler's method, Runge–Kutta method (2nd and 4th orders only), Milne's predictor corrector method.

UNIT-VII

Z – Transformations: Z–transforms, inverse Z–transform, properties, damping rule, shifting rule, initial and final value theorems. Convolution theorem, solution of difference equations by Z–transforms.

UNIT-VIII

Fourier Series and Fourier Transforms: Definition, Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd function, half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, properties, inverse transform, finite Fourier transforms.

TEXTBOOK:

Mathematical Methods, T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, S.Chand and Company, 5th edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley and Sons, Inc., 8th Edition
3. *Introductory methods of Numerical Analysis ,* S.S.Sastry, Prentice Hall of India, 3rd Edition
4. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1EC01: PROBLEM SOLVING AND COMPUTER PROGRAMMING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition.

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 320+ | x2 + y2| + $\sqrt{}$ 2xy
iii) x5 + 10 x4 + 8 x3 + 4 x + 2
iv) aekt

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   sum=1-x2/2! +x4/4!-x6/6!+x8/8!-x10/10!

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.

- Oxford Advanced Learner's Compass, 7th Edition.
- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS01: PROBABILITY AND STATISTICS

L	T	P	C
4	1	-	4

UNIT – I: PROBABILITY & MATHEMATICAL EXPECTATIONS

Introduction to probability: Definition of Random Experiment, Events and Sample space, Definition of probability, Addition and Multiplication theorems, Conditional probability, Baye's Theorem, Simple Problems on Baye's theorem.

Random Variables: Discrete and Continuous random variables, Distribution function of random variable, Properties, Probability mass function, Probability density function, Mathematical expectation, Properties of Mathematical expectations, Mean and Variance.

UNIT – II: PROBABILITY DISTRIBUTIONS

Discrete Distributions: Binomial Distribution, Mean and Standard Deviations of Binomial Distribution, Poisson distribution, Mean and Standard Deviations of Poisson Distribution, Applications.

Continuous Probability Distributions: Uniform Distribution, Exponential Distribution, Normal Distribution, Properties of Normal Distribution, Importance of Normal Distribution, Area properties of Normal curve.

UNIT-III: CORRELATION AND REGRESSION

Correlation: Definition, Measures of correlation, Correlation for Bivariate Distribution, Rank correlation coefficients.

Regression: Simple linear regression, regression lines and properties.

UNIT-IV: SAMPLING DISTRIBUTIONS

Population and Sample, Parameter and Statistic, Sampling Distribution of Statistic, Standard Error of Statistic, Null and Alternative Hypotheses, Type I and II errors, Level of Significance, Critical region, Degrees of freedom.

UNIT-V: LARGE SAMPLES TEST OF SIGNIFICANCE

Test of Significance for Single Proportion, Test of Significance for Difference of Proportions, Test of Significance for a Single Mean, Test of Significance for Difference of Means and Test of Significance for Difference of standard deviations.

UNIT – VI: SMALL SAMPLES TEST OF SIGNIFICANCE

Student's t-test, F-test for equality of population variance, Chi-square Test for Goodness of Test, contingency table, Chi-square Test for Independence of Attributes.

UNIT - VII : Statistical Quality Control

Introduction, Advantages and limitations of statistical quality control, Control charts, Specification limits, $\overline{X}$, R, np and c charts.

UNIT - VIII: QUEUING THEORY:

Queuing Theory, Pure Birth and Death Process, M/M/1 Model, Problems.

TEXT BOOKS:

1. T.K.V. Iyengar, B. Krishna Gandhi and Others, *Probability and Statistics*, S. Chand & Company, 3 ed, 2011.
2. Shahnaz Bathul, *A text book of Probability and Statistics*, 2 ed, Ridge Publications.
3. Kandaswamy & Thilagavathy, *Probability Statistics & Queuing Theory*, 2 ed, S.Chand, New Delhi.

REFERENCE BOOKS:

1. Miller and John E. Freund's, *Probability and Statistics for Engineers*, Pearson Education, 4 ed, 2009.
2. Ronald E. Walpole, *Probability & Statistics for Engineers & Scientists*, Pearson Education India, 2 ed, 2002.
3. S.C.Gupta and V.K.Kapoor, *Fundamentals of Mathematical Statistics*, Sutan and Chand, New Delhi, 2004.
4. S.C.Gupta and V.K.Kapoor, *Fundamentals of Applied Statistics*, Sultan and Chand, New Delhi, 1998.

II B.Tech. I Semester

10BT30421: ELECTRONIC DEVICES AND CIRCUITS

L	T	P	C
4	1	-	4

UNIT-I: PN JUNCTION DIODE

PN Junction Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical, Static and Dynamic Resistances, Diode Equivalent circuits, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

UNIT-II: RECTIFIERS AND FILTERS

PN Junction as a Rectifier, Half wave rectifier, ripple factor, full wave rectifier, Bridge Rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, pi-section filter, Use of Zener Diode as a Regulator.

UNIT-III: BIPOLAR JUNCTION TRANSISTOR (BJT)

Transistor construction, BJT Operation, BJT Symbol, Transistor as an Amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in CB, CE and CC Configurations, BJT specifications.

UNIT-IV: TRANSISTOR BIASING AND STABILIZATION

Operating Point DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in VBE and b.

UNIT-V: BJT AMPLIFIERS

BJT Hybrid Modeling for CB, CE and CC Configurations, Determination of h-Parameters from Transistor Characteristics, Comparison of CB, CE and CC configurations, Simplified Hybrid Model.

UNIT-VI: FIELD EFFECT TRANSISTOR (FET)

Junction Field Effect Transistor (Construction, Principle of Operation, Symbol) - Pinch-Off Voltage - Volt-Ampere Characteristics, MOSFET Characteristics in Enhancement and Depletion Modes, Small Signal Model of JFET & MOSFET.

FET AMPLIFIERS: Common Source, and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, Comparison between BJT and FET.

UNIT-VII: FEEDBACK AMPLIFIERS AND OSCILLATORS (Qualitative treatment)

Feedback Concepts, Types of Feedback Circuits (block diagram representation), General characteristics of negative feedback amplifier, Effect of Feedback on Amplifier characteristics. Barkhausen criterion, Hartley & Colpitts oscillators, Phase Shift Oscillators and Crystal Oscillator.

UNIT-VIII: SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR) and applications.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits,* 1991 Edition, TMH, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits*, 9 ed, PHI, 2006.
3. David A. Bell, *Electronic Devices and Circuits*, 5 ed, Oxford University press, 2008.

REFERENCE BOOKS:

1. J. Millman and Christos C. Halkias, *Integrated electronics*, 1 ed, TMH, 2004.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2 ed, BSP, 2005.
3. Rober T. Paynter, *Introduction to Electronic Devices and Circuits*, 6 ed, Pearson Education.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2 ed, TMH, 2008.

II B.Tech. I Semester

10BT30222: FOUNDATIONS OF ELECTRICAL ENGINEERING

L	T	P	C
4	1	-	4

UNIT–I: INTRODUCTION TO ELECTRICAL ENGINEERING

Essence of electricity-Basic circuit components, Basic definitions: Electric field, Electric Current , Potential and potential deference-EMF-electric power- Ohm's law, resistive networks, Inductive networks, capacitive networks, Kirchoff's laws, series parallel circuits, star delta and delta star transformations- Fuses-Earthing.

UNIT–II: NETWORK ANALYSIS

Basic definitions: Node, Path, Loop, Branch - Nodal analysis– Mesh analysis- Source Transformation Technique –Problems.

Network Theorems: Superposition -Thevenin's - Maximum Power Transfer Theorems.

UNIT-III: ALTERNATING QUANTITIES

Principle of AC voltages, wave forms and basic definitions, RMS and average values of alternating currents and voltage, form factor and Peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of AC circuits with single basic network element, single phase series and parallel circuits- Fundamentals of 3-phase supply.

UNIT-IV: DC MACHINES

Constructional details of a DC machine, principle of operation of a DC generator, types of DC generators, emf equation of a generator –Applications.

DC motors- Principle of operation, types of DC motors, Torque equation, losses and efficiency-Applications.

UNIT-V: AC MACHINES

Transformers- principle of operation, constructional details, losses and efficiency, regulation of transformer, testing of Transformers: OC and SC test- Simple problems.

Three phase Induction motors- Constructional details- principle of operation, slip, rotor frequency.

UNIT - VI: BASIC MEASURING INSTRUMENTS & VOLTAGE CONTROL

Introduction, classification of instruments, operating principles, essential features of measuring instruments, moving coil permanent magnet and moving iron instruments(voltmeters and ammeters)-Extension of range of meters- Voltage Stabilizers-UPS.

UNIT- VII: INTRODUCTION TO CONTROL SYSTEMS

Introduction, classification of Control Systems- Open loop and closed loop systems, linear and non-linear systems, time variant and time invariant systems, feedback and effect of feedback systems.

UNIT-VIII: TRANSFER FUNCTIONS

Transfer Functions, formation of transfer functions for Mechanical and Electrical systems, block diagram reduction technique, signal flow graphs- Mason's gain formula (elementary treatment only).

TEXT BOOKS:

1. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*, Oxford University press. 2009.
2. A. Nagoor Kani, *Control Systems*, RBA Publications, 2nd Edition, 2007.

REFERENCE BOOKS:

1. M.S. Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering,* Tata Mc Graw-Hill Companies, 2007.
2. W.H. Jayt and J.E. Kemmerly and S.M. Durbin, *engineering Circuits Analysis*, 6th Edition, 2008, Tata Mc Graw-Hill Companies.
3. V.K. Mehta, Rohit Mehta, *Principles of power systems*, S. Chand & Company Ltd., 2006.
4. A.K. Theraja and A.K. Theraja Vol - 2, *A text book Electrical Technology,* Vol - 2, S. Chand & Company, 2000.

II B.Tech. I Semester

10BT30422: DIGITAL LOGIC DESIGN

L	T	P	C
4	1	-	4

UNIT-I: BINARY SYSTEMS

Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

UNIT-II: BOOLEAN ALGEBRA AND LOGIC GATES

Basic Definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, Other logic operations, Digital logic gates, Integrated circuits.

UNIT-III: GATE – LEVEL MINIMIZATION

The k-map method - Four-variable map, Five-Variable map, product of sums simplification and sum of products, Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function, Hardware Description language (HDL).

UNIT-IV: COMBINATIONAL LOGIC

Combinational Circuits, Analysis procedure, Design procedure, Binary Adder-Subtractor , Decimal Adder, Binary multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

UNIT-V: SYNCHRONOUS SEQUENTIAL LOGIC

Sequential circuits, Latches, Flip-Flops, Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure.

UNIT-VI: REGISTERS AND COUNTERS

Registers, shift Registers, Ripple counters, Synchronous counters, Other counters, HDL for Registers and counters.

UNIT-VII: MEMORY AND PROGRAMMABLE LOGIC

Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-only memory, Programmable logic Array, programmable Array logic, Sequential Programmable Devices.

UNIT-VIII: ASYNCHRONOUS SEQUENTIAL LOGIC

Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race- Free State Assignment Hazards, Design Example.

TEXT BOOKS:

1. M. Morris Mano, *Digital Design,* 3 ed, Pearson Education/PHI, 1999.
2. Roth, *Fundamentals of Logic Design*, 5 ed, Thomson, 2004.

REFERENCE BOOKS:

1. Zvi. Kohavi, *Switching and Finite Automata Theory*, Tata McGraw Hill, 2004.
2. C.V.S. Rao, *Switching and Logic Design*, 3 ed, Pearson Education, 2009.
3. Donald D.Givone, *Digital Principles and Design*, Tata McGraw Hill, 2002.
4. M. Rafiquzzaman, *Fundamentals of Digital Logic and Micro Computer Design*, 5 ed, John Wiley, 2005.

II B.Tech. I Semester

10BT30501: DISCRETE MATHEMATICAL STRUCTURES

L	T	P	C
4	1	-	4

UNIT-I: MATHEMATICAL LOGIC

Statements and notations, Connectives, Well formed formulae, Truth Tables, Tautology, Equivalence of formulae, Normal forms.

UNIT-II: PREDICATES

Predicate Calculus, Free & Bound variables, Rules of inference, Consistency, Proof of contradiction and Automatic Theorem Proving.

UNIT-III: RELATIONS AND FUNCTIONS

Properties of binary relations, Equivalence relations, Compatibility relations Partial ordering relations, Hasse diagram and related applications.

Functions: Inverse Functions, Composition of functions, Recursive functions, Lattice and its Properties.

UNIT-IV: ALGEBRAIC STRUCTURES

Algebraic System Examples and General Properties, Semi Groups and Monoids, Groups, Subgroups, Homomorphism and Isomorphism.

UNIT-V: MATHEMATICAL REASONING

Methods of Proof, Mathematical Induction

Counting: Basics of counting, The Inclusion- Exclusion Principle, The Pigeon hole principle, Permutations & Combinations, Generalized Permutations and Combinations.

UNIT-VI: RECURRENCE RELATION

Generating Functions of Sequences, Calculating coefficients of Generating function, Recurrence relation, solving recurrence relations by substitution and Generating functions, Methods of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relation.

UNIT-VII: GRAPHS

Introduction to Graphs, Types of Graphs, Graph basic terminology and Special types of simple graphs, Representation of Graphs and graph Isomorphism, Euler Paths and Circuits, Hamiltonian Paths and Circuits, Planar Graphs, Euler's Formula and Graph Coloring, 4-color theorem, 5-color theorem.

UNIT-VIII: GRAPH THEORY AND ITS APPLICATIONS

Introduction to Trees, Properties of Trees, Applications of Trees, Spanning Trees, Counting trees, Depth-First Search, Breadth-First Search, Minimum Spanning Trees, Kruskal's Algorithm and Prim's Algorithm.

TEXT BOOKS:

1. J.P. Trembly and R. Manohar, *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, 1997.
2. Kenneth H. Rosen, *Discrete Mathematics and its Applications*, 6 ed, Tata McGraw Hill, 2007.

REFERENCE BOOKS:

1. Joe L.Mott and Abraham Kandel, *Discrete Mathematics for Computer Scientists and Mathematicians*, 2 ed, Prentice Hall of India Private Limited, 2004.
2. C.L. Liu and D.P. Mohapatra, *Elements of Discrete Mathematics*, 3 ed, McGraw Hill, 2008.
3. Ralph P. Grimaldi and B.V.Ramana, *Discrete and Combinatorial Mathematics- An Applied Introduction*, 5 ed, Pearson Education, 2006.
4. D.S Mallik and M.K Sen, *Discrete Mathematical Structures: Theory and Applications*, Course Technology, 2004.

II B.Tech. I Semester

10BT30502: DATA STRUCTURES

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO DATA STRUCTURES

Definition, Classification, The Abstract Data Type (ADT), model for ADT, ADT implementation, Generic code for ADTs

Sorting: Sort concepts, Merge sort, Shell sort, Quick sort, Heap sort. Searching: Sequential search, variations on sequential search, Binary search, Fibonacci search.

UNIT-II: GENERAL LINEAR LISTS

Singly linked list, Basic Operations, Implementation, List ADT, Circularly linked lists, Doubly linked lists, Multi linked lists.

UNIT-III: STACKS AND QUEUES

Basic stack operations, Stack linked list, implementation, Stack ADT, Applications: Reversing data, Convert Decimal to binary, Postponement.

Queues: Queue operations, Queue linked list design, Queue ADT, Applications: Categorizing data, Queue simulations,

UNIT-IV: NON LINEAR LISTS

Basic tree concepts, Binary trees: properties, traversals, expression trees.

Binary search trees: Basic concepts, Operations, Binary Search Tree ADT, Threaded trees

UNIT- V: AVL TREES

Basic Concepts, Balance Factor, implementation, ADT, Algorithms, and Applications: Count words.

Heaps: Basic Concepts, Implementation, ADT, Heap Application

UNIT- VI: MULTIWAY TREES

M-way search trees, B-trees: Implementation- Insertion, Deletion, Balance, Combine, Traversal, Search, B-tree ADT, Simplified B-trees, lexical search trees.

UNIT-VII: GRAPHS

Basic Operation, Review of traversals- Breadth first traversal, Depth first traversal, Graph storage structures, Graph ADT, Networks: Minimum spanning trees, Shortest path algorithm.

UNIT-VIII: HASH TABLES

Introduction, Hash Table structure, Hash functions, Linear open Addressing, Chaining, Applications

File Organizations: Introduction, Files, Keys, Basic File Operations, Heap Organization, Sequential File Organization, Indexed Sequential File Organization, Direct File Organization.

TEXT BOOKS:

1. Richard F.Gilberg , Behrouz A.Forouzan, *Data Structures- A Pseudocode Approach with C*, 2 ed, CengageLearning, 2007.
2. G.A.V. Pai, *Data Structures and Algorithms*, Tata McGraw Hill, 2009.

REFERENCE BOOKS:

1. J. Tremblay, P. Sorensen, *An introduction to data structures with Applications*, 2 ed, Tata McGraw-Hill International Editions, 1984.
2. M. Weiss, *Data Structures and Algorithm Analysis in C++*, Pearson Education, 2 ed, 2002.
3. E. Horowitz, S. Sahni, D. Mehta Galgotia, *Fundamentals of Data Structures in C++*, Book Source, New Delhi, 1995.
4. Y. Langsam, M. Augenstin and A. Tannenbaum, *Data Structures using C and C++*, 2 ed, Prentice Hall of India, 2002.
5. A. Drozdek, *Data Structures in C++*, 2 ed, Thomson Brookes/ COLE Books, 2002.

II B.Tech. I Semester

10BT30431:**ANALOG AND DIGITAL ELECTRONICS LAB**

L	T	P	C
-	-	3	2

PART A: **ELECTRONIC WORKSHOP PRACTICE** (Only for Viva-Voce)

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards. Identification, Specifications and Testing of Active Devices: Diodes, BJTs, Low-power JFETs, MOSFETs, LEDs, LCDs, SCR, UJT, Linear and Digital ICs.

PART B: **Analog Devices and Circuits** (Minimum seven experiments to be conducted)

1. PN Junction and Zener diodes characteristics
2. Ripple Factor and Load Regulations of Rectifier with and without filters
   (Full wave or Half wave)
3. Input and Output characteristics of Transistor in CE configuration
4. Drain and Transfer Characteristics of JFET
5. Gain and Frequency response of CE Amplifier
6. Gain and Frequency response of Feedback Amplifier (Voltage series or current series)
7. Frequency of oscillations of Hartley and Colpitts Oscillator
8. UJT relaxation oscillator
9. SCR characteristics

PART C: **Digital Circuits**

Realization of:

1. Flip Flops using Logic Gates
2. Two Problems on Combinational Circuits
3. Asynchronous Counter
4. Synchronous Counter

Demonstration of:

VHDL Programme

II B.Tech. I Semester

10BT30511: **DATA STRUCTURES LAB**

L	T	P	C
-	-	3	2

1. a. Implement Quick sort algorithm on the list L={ 67, 78, 34, 11, 99, 42, 56, 23}and display the output list at the end of each pass.
   b. Implement Merge sort algorithm on the lists L1={123, 678, 345, 225, 890, 650,111}, L2= { 654, 789, 912, 144, 255, 666 }

2 a. Implement Heap sort for the list L= {H, V, A, T, L, M, K, U}
   b. Implement Heap sort for the list L of 1 (a).

3. Implement binary search and Fibonacci search algorithms on an ordered list L={2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18, 19,20} Undertake search for the elements in the list { 3, 18,1,25}. Compare the number of keys comparisons made during the searches.

4. Write a program to implement the following operations on singly linked list
   i) Creation ii) Insertion iii) Deletion vi) Display

5. Write a menu driven program which will maintain a list of car models, their price, name of the manufacturer, engine capacity etc., as a doubly linked list. The menu should make provisions for inserting information pertaining to new car models, delete obsolete models, update data such as price besides answering queries such as listing all car models within a price range specified by the client and listing all details given a car model.

6. Write C programs to implement the following using an array.
   i) Stack ADT ii) Queue ADT

7. Write C programs to implement the following using a singly linked list.
   i) Stack ADT ii) Queue ADT

8. Write a C program to perform the following operations:
   i) Insert an element into a binary search tree.
   ii) Delete an element from a binary search tree.
   iii) Search for a key element in a binary search tree.

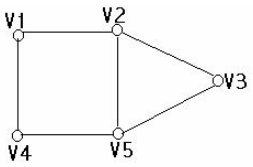
9. Write C program that use recursive functions to traverse the given binary tree in
   i) Preorder ii) Inorder iii) Postorder (Non recursive)

10. Write a C program to perform the following operation
    i) Insertion into an AVL - tree
    ii) Deletion from an AVL – tree

11. Write a C program to perform the following operations
    i) Insertion into a B-tree
    ii) Deletion from a B-tree

12. Write C programs for the implementation of BFS(Breadth First Search) and DFS(depth First Search) for a given adjacency matrix

    Adjacency Matrix for a Simple Graph:



	V1	V2	V3	V4	V5
V1	0	1	0	1	0
V2	1	0	1	0	1
V3	0	1	0	0	1
V4	1	0	0	0	1
V5	0	1	1	1	0

From the chart above, the adjacency matrix for the graph G is:

0	1	0	1	0
1	0	1	0	1
0	1	0	0	1
1	0	0	0	1
0	1	1	1	0

13. a. Implement a hash table using an array data structure. Design functions to handle overflows using i) linear probing ii) quadratic probing iii) rehashing for a set of keys.

    b. Implement a hash table for a given set of keys using chaining method of handling overflows. Maintain the chains in the ascending order of keys. Design a menu driven front end to perform the insert, delete, and search operations on the hash table.

TEXT BOOKS:

1. Richard F.Gilberg, Behrouz A.Forouzan, *Data Structures- A pseudocode Approach with C*, 2 ed, CengageLearning, 2007.
2. G.A.V. Pai, *Data Structures and Algorithms*, Tata McGraw Hill, 2009.

REFERENCE BOOKS:

1. J. Tremblay, P. Sorensen, *An introduction to data structures with Applications*, 2 ed, Tata McGraw-Hill International Editions, 1984.
2. M. Weiss, Data Structures and Algorithm Analysis in C++, 2 ed, Pearson Education, 2002.
3. E. Horowitz, S. Sahni, D. Mehta Galgotia, *Fundamentals of Data Structures in C++*, Book Source, New Delhi, 1995.
4. Y. Langsam, M. Augenstin and A. Tannenbaum, *Data Structures using C and C++*, 2 ed, Prentice Hall of India, 2002.
5. A. Drozdek, *Data Structures in C++*, 2 ed, Thomson Brookes/ COLE Books.

II B.Tech. II Semester

10BT3BS02: ENVIRONMENTAL SCIENCES

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION TO ENVIRONMENTAL SCIENCES

Definition and concept of the term environment, Various components of environment, Abiotic and biotic, Atmosphere, Hydrosphere, Lithosphere, Biosphere, Interrelationships, Need for public awareness, Role of important national and international individuals and organizations in promoting environmentalism.

UNIT – II: NATURAL RESOURCES, CONSERVATION AND MANAGEMENT

Renewable and Non renewable resources and associated problems. Forests: Deforestation, Causes, effects and remedies, Effects of mining, dams and river valley projects, case studies. Water resources: Water use and over exploitation, Conflicts over water, Large dams, benefits and problems. Food resources : World food problems, Adverse effects of modern agriculture, Fertilizer and pesticide problems. Land resources: Land degradation, Land slides, Soil erosion, desertification, water logging, salinity, Causes, effects and remedies. Mineral resources: Mining, Adverse effects. Energy resources: Growing needs, Renewable and Non renewable resources. Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear energy, Hydrogen fuel and Solar energy, Impact on environment, Sustainable life styles.

UNIT – III: ECOLOGY AND ECOSYSTEMS

Definitions and concepts, Characteristics of ecosystem, Structural and functional features, Producers, consumers and decomposers and food webs, Types of ecosystems, Forests grassland, desert, crop land, pond, lake, river and marine ecosystems, Energy flow in the ecosystem, Ecological pyramids, Ecological successions.

UNIT – IV: BIO DIVERSITY, CONSERVATION AND MANAGEMENT

Introduction, Definition and concept of biodiversity, Value of

biodiversity, Role of biodiversity in addressing new millennium challenges, Global, national biodiversity, Hot spots of biodiversity, Threats to biodiversity, Man and wild life conflicts, Remedial measures, Endemic, endangered and extinct species, In-situ and ex-situ conservation of biodiversity.

UNIT – V: ENVIRONMENTAL POLLUTION AND CONTROL

Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution, Solid waste management, Causes, effects, control and disposal methods, Role of individuals in the prevention of pollution, Hazards and disaster management, Floods, Earthquakes, Tsunamis, Cyclones, Land slides, Case studies.

UNIT – VI: SOCIAL ISSUES AND THE ENVIRONMENT

Concept of sustainable development, Methods of rainwater harvesting, Watershed management, Waste land reclamation, Green cover, Green power, Green technology, Resettlement and rehabilitation of people and related problems, Case studies, Issues and possible solutions, Greenhouse effect and global warming, Carbon credits, Acid rains, Ozone layer depletion, Causes, effects and remedies, Consumerism and waste production, Environment protection acts, Air act, Water act, Forest conservation act, Wild life protection act, Issues involved in the enforcement.

UNIT – VII: HUMAN POPULATION AND ENVIRONMENT

Population growth and its impact on environment, Environmental ethics, Family welfare programmes, Human health: T.B., Cancer, HIV/ AIDS, Causes, effects and remedies, Occupational health hazards, Human rights, Important international protocols and conventions on environment.

UNIT - VIII

FIELD WORK/ENVIRONMENTALIST'S DIARY/ASSIGNMENTS/ SEMINARS

TEXT BOOKS:

1. Erach Barucha, *Environmental Studies*, 1st edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies,* 3rd edition, New Age International Publishers, 2011.

REFERENCE BOOKS:

1. Desh wal, *Environmental Studies,* 2nd edition, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1st edition, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies,* 2nd edition, Tata McGraw-Hill, New Delhi, 2010.

II B.Tech. II Semester

10BT40501: COMPUTER ARCHITECUTRE AND ORGANIZATION

L	T	P	C
4	-	-	4

UNIT I: STRUCTURE OF COMPUTERS

Computer Types, Functional Units, Basic Operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputers.

Computer Arithmetic: Review of Representation of Information, Addition and Subtraction, Multiplication and Division Algorithms, Floating-Point Arithmetic Operation, Decimal Arithmetic Unit, Decimal Arithmetic operations.

UNIT II: REGISTER TRANSFER AND MICRO-OPERATIONS

Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit, Instruction Codes, Computer Registers, Computer Instructions, Instruction Cycle, Timing and Control, Memory-Reference Instructions, Input-Output and Interrupt.

Central Processing Unit: Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). Comparison of RISC and CISC.

UNIT III: MICRO-PROGRAMMED CONTROL

Control Memory, Address Sequencing, Micro-program Example, Design of Control Unit, Hardwired Control, Micro-programmed Control, Nanoprogramming.

UNIT IV: PIPELINE AND VECTOR PROCESSING

Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data Path & Control Consideration, Superscalar Operations, Vector Processing, Array Processors.

UNIT V: THE MEMORY SYSTEM

Basic Concepts, Semiconductor RAM, Types of Read-only Memory (ROM), Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage, and Introduction to Redundant Array of Inexpensive Disks (RAID).

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA).

UNIT-VI: INPUT-OUTPUT ORGANIZATION (ADVANCED)

Input-Output Processor (IOP), Serial communication, Introduction to peripheral component Interconnect (PCI) bus, Introduction to Standard Serial Communication Protocols Like RS232, USB, and IEEE1394.

UNIT VII: MULTIPROCESSORS

Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Cache Coherence, Shared Memory Multiprocessors.

UNIT VIII: CASE STUDIES

CISC Architecture-Pentium IV, RISC Architecture-PowerPC.

TEXT BOOKS:

1. M. Moris Mano, *Computer System Architecutre*, 3ed, Pearson/PHI, 2008.
2. William Stallings, *Computer Organization and Architecutre*, 6ed, Pearson/PHI.

REFERENCE BOOKS:

1. Carl Hamacher, Zvonks, Vranesic, SafeaZaky, *Computer Organization*, 5ed, McGraw hill, 2002.
2. Andrew S. Tanenbaum, *Structured Computer Organization*, 4ed, PHI/Pearson.
3. Sivarama P. Dandamudiu, *Fundamentals of Computer Organization and Design*, Springer Int. Edition, 2003.
4. John P. Hayes, *Computer Architecture and Organization*, 3ed, Tata McGraw Hill, 1998.

II B.Tech. II Semester

10BT50501: DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big (o) notation, Omega notation, Theta notation and Little (o) notation, Recurrences, Probabilistic analysis.

UNIT II: DISJOINT SETS AND GRAPHS (Algorithm and Analysis)

Disjoint set operations, union and find algorithms, Graphs-Breadth First search and Traversal, Depth First Search and Traversal, spanning trees, connected components and biconnected components.

UNIT III: DIVIDE AND CONQUER

General method, Applications-Analysis of Binary search, Quick sort, Merge sort, Strassen's matrix multiplication, Finding the Maxima and Minima.

UNIT IV : GREEDY METHOD

General method, Applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Optimal storage on Tapes.

UNIT V: DYNAMIC PROGRAMMING

General method, Applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design, String Editing.

UNIT VI: BACKTRACKING

General method, applications-n-queen problem, sum of subsets problem, graph colouring, 0/1 knapsack problem, Hamiltonian cycles.

UNIT VII: BRANCH AND BOUND

General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT VIII: NP-HARD AND NP-COMPLETE PROBLEMS

Basic concepts, non-deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem, NP-hard scheduling Problems.

TEXT BOOKS :

1. Ellis Horowitz, Satraj Sahni and Rajasekharam, *Fundamentals of Computer Algorithms*, 2ed, Galgotia Publications Pvt. Ltd.

REFERENCE BOOKS:

1. M.T. Goodrich and R. Tomassia, *Algorithm Design: Foundations, Analysis and Internet Examples*, John Wiley and Sons, 2002.
2. R.C.T.Lee, S.S. Tseng, R.C. Chang and T. Tsai, *Introduction to Design and Analysis of Algorithms A Strategic Approach*, McGraw Hill, 2006.
3. Allen Weiss, *Data Structures and Algorithm Analysis in C++*, 2ed, Pearson Education.
4. Aho, Ullman and Hopcroft, *Design and Analysis of Algorithms*, 2ed, Pearson Education.

II B.Tech. II Semester

10BT4EC01: OPTIMIZATION TECHNIQUES

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION TO OPTIMIZATION TECHNIQUES

Statement of an optimization problem, design vector, design constraints, constraint surface, objective function, objective function surfaces, classification of optimization problems.

UNIT II: CLASSICAL OPTIMIZATION TECHNIQUES

Single variable optimization, multi variable optimization without constraints, necessary and sufficient conditions for minimum/ maximum, multivariable optimization with equality constraints, solution by method of lagrange multipliers, multivariable optimization with inequality constraints, Kuhn – Tucker conditions.

UNIT III: INTRODUCTION TO LINEAR PROGRAMMING

Standard form of a linear programming problem, geometry of linear programming problems, definitions and theorems, solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations, motivation to the simplex method, simplex algorithm, big M-method, dual simplex algorithm.

UNIT IV: TRANSPORTATION PROBLEM AND CONVEX PROGRAMMING

Finding initial basic feasible solution by North–West corner rule, least cost method and Vogel's approximation method, Assignment problems, variants, Integer Programming, Branch and bound technique, Convex programming.

UNIT V: UNCONSTRAINED NONLINEAR PROGRAMMING:

One–dimensional minimization methods: Classification, Fibonacci method, Problems and Quadratic interpolation method, Problems.

UNIT VI: UNCONSTRAINED OPTIMIZATION TECHNIQUES

Univariate method, Problems, Powell's Method, Conjugate directions, Algorithms, Problems, Steepest Descent (Cauchy) Method, Problems.

UNIT VII: CONSTRAINED NONLINEAR PROGRAMMING

Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods.

UNIT VIII: DYNAMIC PROGRAMMING

Dynamic programming, multistage decision processes, types, concept of sub optimization and the principle of optimality, computational procedure in dynamic programming, examples illustrating the calculus method of solution, examples illustrating the tabular method of solution.

TEXT BOOKS:

1. S.S. Rao, *Engineering Optimization: Theory and Practice,* 3ed, New Age International (P) Limited, 1998.
2. Dr. S.D. Sharma, *Operations Research*, Kedarnath Ram Nath and Co. Publications, Meerut, 2003.

REFERENCE BOOKS:

1. H.A. Taha, *Operations Research: An Introduction*, 6ed, PHI Pvt. Ltd.
2. Kanthi Swaroop, Gupta and Mohan, *Introduction to Opearations Research*, 2006.

II B.Tech. II Semester

10BT50502: MICROPROCESSORS AND INTERFACING

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

An overview of 8085, Architecture of 8086 microprocessor, Register organization, 8086 flag register and functions of 8086 flags, Addressing modes of 8086, Instruction set of 8086, Assembler directives, Simple programs, Procedures and Macros.

UNIT-II: ASSEMBLY LANGUAGE PROGRAMMING

Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III: ARCHITECTURE OF 8086 AND INTERFACING

Pin configuration of 8086-Minimum mode and maximum mode of operation, Timing diagram, Memory interfacing to 8086 (static RAM and EPROM), Need of Direct Memory Access (DMA), DMA data transfer method, Interfacing with 8237/8257.

UNIT-IV: PROGRAMMABLE INTERFACING DEVICES

8255 PPI-various modes of operation and interfacing to 8086. Interfacing keyboard, displays, 8279, stepper motor and actuators. D/A and A/D converter interfacing.

UNIT-V: INTERRUPTS AND PROGRAMMABLE INTERRUPT CONTROLLERS

Interrupt structure of 8086, Interrupt Vector table, Interrupt service routines, Introduction to DOS and BIOS interrupts, 8259 PIC architecture and interfacing cascading of interrupt controller and its importance, Programming with 8259.

UNIT-VI: SERIAL DATA TRANSFER SCHEMES

Asynchronous and synchronous data transfer schemes, 8251 USART architecture and interfacing, TTL to RS232C and RS232C to TTL conversion, Sample programs for serial data transfer, Introduction to high-speed serial communications standards, USB.

UNIT-VII: ADVANCED MICROPROCESSORS

Introduction to 80286, Salient Features of 80386, Real and Protected Mode, Segmentation and Paging, Salient Features of Pentium, Branch Prediction, Overview of RISC Processors.

UNIT-VIII: 8051 MICROCONTROLLER AND ITS PROGRAMMING

Architecture of Microcontroller - 8051 Microcontroller - internal and external memories -counters and timers - synchronous serial-cum asynchronous serial communication-interrupts.

Addressing modes of 8051, Instruction set of 8051, Assembly Language Programming examples using 8051.

TEXT BOOKS:

1. A.K. Ray and K.M.Bhurchandi, *Advanced microprocessor and peripherals,* Tata Mc-Graw Hill Edition, 2nd Edition, 2000.
2. Kenneth J. Ayala, *The 8051 Microcontroller architecture, programming & applications,* Pearson, 2ed.

REFERENCE BOOKS:

1. Douglas V.Hall, *Microprocessors Interfacing*, 2nd Edition, 2007.
2. Walter A. Triebel, Avtar Singh, *The 8088 and 8086 Microprocessors,* PHI, 4th Edition, 2003.
3. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems,* PHI, 2000.
4. Deshmukh, *Microcontrollers*, Tata Mc-Graw Hill Edition, 2004.

II B.Tech. II Semester

10BT40502: OBJECT ORIENTED PROGRAMMING

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO OBJECT ORIENTED PROGRAMMING
Need for OOP paradigm, OOP concepts, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions. C++ class overview-class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

UNIT-II: POLYMORPHISM AND INHERITANCE
Function overloading, operator overloading, generic programming-function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, abstract classes, Streams.

UNIT-III: BASICS OF JAVA
History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT-IV: INHERITANCE AND INTERFACES
Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes. Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-V: EXCEPTION HANDLING
Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages,

Exception handling: Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

UNIT-VI: MULTITHREADING AND APPLETS

Differences between multithreading and multitasking, thread life cycle, creating threads, synchronizing threads. Applets: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets ,Graphics class.

UNIT-VII: EVENT HANDLING

Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics, layout manager – boarder, grid, flow, card and grid bag.

UNIT-VIII: SWINGS

Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing – Japplet, JFrame and JComponent, Icons and labels, text fields, The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Robert Lafor, Waite Group's, *Object-Oriented Programming*, 3rd Edition, 2007.
2. Herbert Schildt, *Java-the Complete reference,* 7th edition, TMH, 5th Reprint 2008.

REFERENCE BOOKS:

1. Y. Daniel Liang, *Introduction to Java Programming,* 6th Edition, Pearson Eduction.
2. Cay.S.Horstmann and Gray Cornell, *Core Java 2, Vol 1*, 7th Edition, Pearson Education.
3. S.B.Lippman, *C++ Primer,* 3rd Edition, Pearson Education.
4. W. Savith, *Problem Solving with C++, The OOP*, 4th Edition, Pearson Education.
5. B. Stroustrup, *The C++ Programming Language,* 3rd Edition, Pearson Education

II B.Tech. II Semester

10BT40511: OBJECT ORIENTED PROGRAMMING LAB

L	T	P	C
-	-	3	2

1. a) Write a C++ program that prints Student Name, Roll No., Branch, Marks and display the Total and Division in the following format after reading the necessary input (Use\n \t etc..).

Name	::	********
Roll No	::	********
Branch	::	********
Marks	::	********
Total	::	********
Division	::	********

b) Write a C++ program to perform complex operations addition, Subtraction, Multiplication and Division using friend function**.**

2. a) Write a program in C++ to perform the following using the function template concepts.

a. To read a set of integers

b. To read a set of floating point numbers

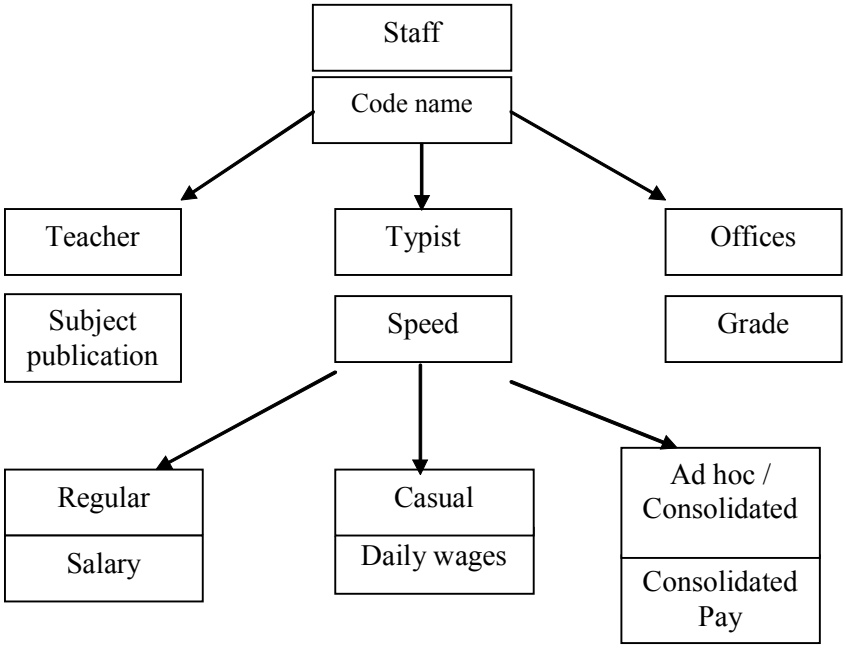
c. To read a set of double numbers

Write function for finding average of non-negative numbers and also calculate the deviation of the numbers.

b) Write a class Fraction that defines methods addition, subtraction, multiplication and division of fractions by overloading basic arithmetic operators.

3. a) Write a C++ program to implement the given hierarchy, using the appropriate methods.

Class relations



Salary – DA, HRA, PF, Dailywages – 200/- per day, Consolidated pay – Fixed Amount

b) Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get data() to initialize base class data members and another member function display area() to compute and display the area of figures. Make display area() as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively, and

display the area.

Remember the two values given as input will be treated as length of two sides in the case of rectangles, and as base and height in the case of triangles, and used as follows:

Area of rectangle = x * y

Area of triangle = ½ * x * y

4. a) Create a class called Date that includes three pieces of information as instance variables-a month (type int), a day (type int). Your class should have a constructor that initializes the three values provided are correct.

Provide set and get method for each instance variable. Provide a method display date that displays the month, day, year separated by forward slashes (/).

Write a test application named DateTest that demonstrates Class Date's capabilities.

b) Create a class huge Integer which uses a 40-element array of digits to store integers as large as 40 digits each. Provide Methods: isEqualTo, isNotEqualTo, isGreaterThan, isLessThan, isGreaterThanorEqual and isLessThanorEqualTo.

Each method returns a boolean value if the relation ship holds true.

5. a) Write a program that reads a line of integers (maximum limit 6 digits), and then displays each integers and sum of all the integers. (Hint: Use StringTokenizer class)

b) Write a program to do the following

a) To print a question "Who is inventor of Java"?

b) To accept the answer

c) To print out "Good" and then stop, if the answer is correct.

d) To output the message "try again", if the answer is wrong.

e) To display the correct answer when the answer is wrong even at the third attempt and stop.

6. a) Assume that a bank maintains two kinds of account for its customers, one called saving account and the other current account.

The savings account provides compound interest and with drawl facilities but no chequebook facility. The current account provides chequebook facility but no interest.

Current account holders should also maintain a minimum balance and if the balance falls below this level a service charge is imposed.

Create a class account that stores customer name, account number and type of account. From this derive the classes Curr_Acct and Sav_Acct to make them more specific to their requirements.

Include the necessary methods in order to achieve the following tasks:

a) Accept deposit from a customer and update the balance
b) Display the balance.
c) Compute and deposit interest.
d) Permit with drawl and update the balance.
e) Check for the minimum balance, impose penalty, if necessary and update the balance.

b) Write an inheritance hierarchy for classes Quadrilateral, Trapezoid, Parallelogram, Rectangle and Square. Use Quadrilateral as the super class of the hierarchy. Make the hierarchy as deep as possible. Specify the instance variables and methods for each class. The private instance variables of Quadrilateral. Write a program that instantiates objects of your classes and outputs the object's area (except Quadrilateral).

7. a) Write a program to illustrate an inner class by creating an anonymous object in the main class.

b) Design an interface 'Movable Shape' that can be used as a generic mechanism for animating a shape. A movable shape must have two methods: move and draw. Write a 'Animation Panel' class that paints and moves any 'Movable Shape' supply movable rectangle and car shapes.

8. a) Write a package called Math that implements class exactly java.lang.math, with a distinguished set of mathematical functions and also Date manipulation functions.

b) Implement Stack ADT using Packages.

9. a) Write a program that converts from 24-hour time to 12-hour time. Define an exception class IllegalTimeFormat, if the user enters an illegal time like 11:65 or even gibberish like &&* 68, throw and catch the exception.

b) Write a program that calls a method that throws an exception of type Arithmetic Exception at a random iteration in a for loop. Catch the Exception in the method and pass the iteration count when the exception occurred to the calling method by using an object of an exception class you define. Add a finally block to the method to output the iteration count when the method exists.

10.a) Write a program that correctly implements producer consumer problem using the concept of inter thread communication.

b) Write a program that demonstrates time slicing among equal priority threads, show that a lower priority thread's execution is deferred by the time slicing of higher-priority threads.

11.a) Develop an applet that displays a simple message.

b) Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked.

12.a) Write a Java program for handling Mouse Events.

b) Write a Java program for handling Keyboard Events.

13. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

II B.Tech. II Semester

10BT50511: MICROPROCESSORS AND INTERFACING LAB

L	T	P	C
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I. Microprocessor 8086:

1. Introduction to MDS
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. Interfacing:

1. 8259 – Interrupt Controller: Generate an interrupt using 8259.
2. 8279 – Keyboard Display: Write a small program to display a string of characters.
3. 8255 – PPI: Interfacing DAC, Stepper Motor, ADC.
4. 8251 – USART: Write a program in ALP to establish Communication between two processors.

III. Microcontroller 8051

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

III B.Tech. I Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition, Nature and scope of managerial economics. Demand Analysis: Determinants of demand, Demand Function-Law of demand and its exceptions. Elasticity of demand. Types, Measurement and significance of Elasticity of demand. Demand forecasting and methods of demand forecasting.

UNIT-II: THEORY OF PRODUCTION AND COST ANALYSIS

Production Function: isoquants and isocosts. Input – output relationship. Law of returns, internal and external economies of scale. cost concepts: opportunity Vs outlay costs, Fixed Vs Variable costs, Explicit Vs implicit costs, out of pocket Vs inputted costs. Break Even Analysis (BEA), Determination of break even point (Simple problems).

UNIT-III: INTRODUCTION TO MARKETS AND PRICING

Market Structure: Types of Markets. Features of Perfect competition. Monopoly and Monopolistic competition. Price and output determination in Perfect competition and Monopoly. Pricing: Objectives and policies of Pricing – Sealed bid pricing, Marginal cost pricing, Cost plus pricing, Going rate pricing, Limit Pricing, Market Penetration, Market Skimming, Block pricing, Bundling, Peak load pricing, Cross subsidization,Duel Pricing, Administrated pricing.

UNIT-IV: BUSINESS AND NEW ECONOMIC ENVIRONMENT

Characteristic features of Business, features and evolution of Sole proprietorship, Partnership, Joint stock Company, New Economic policy 1991.

UNIT-V: INTRODUCTION AND PRINCIPLES OF ACCOUNTING

Introduction, Concepts, Conventions, Accounting Principles, Double Entry Book Keeping, Journal, Ledger, Trial Balance (Simple Problems).

UNIT – VI: FINAL ACCOUNTS

Introduction to Final Accounts. Trading Account, Profit and Loss Account, and Balance Sheet with simple adjustments (Simple Problems).

UNIT – VII: CAPITAL AND CAPITAL BUDGETING

Capital: Significance, Types of capital. Capital Budgeting: Nature and scope of capital budgeting. Features and Methods of capital budgeting. Payback Period Method, Accounting Rate of Return Method, Internal Rate of Return Method, Net present Value Method and Profitability Index (Simple Problems).

UNIT – VIII: COMPUTERIZATION OF ACCOUNTANCY SYSTEM

Manual Accounting Vs Computerized Accounting – Advantages and Disadvantages of Computerized Accounting – Using Accounting Software. Tally: Tally features – Company Creation – Account Groups – Group Creation – Ledger Creation**.**

TEXT BOOK:

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3rd Edition, Tata Mc-Graw Hill, New Delhi, 2007.
2. R. Cauvery, U.K.Sudhanayak, M.Girija and R. Meenakshi, *Managerial Economics*, 1st Edition, S.Chand & Company, New Delhi, 1997.

REFERENCE BOOKS:

1. Ms. Samba Lalitha, *Computer Accounting Lab Work*, 1st Edition, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19th Edition, Sultan Chand & Sons, New Delhi, 2005.
3. H.Craig Petersen and W.Cris Levis, *Managerial Economics*, 4th Edition, Pearson, 2009.
4. Lipsy and Chrystel, *Economics*, 4th Edition, Oxford University Press, New Delhi, 2008.
5. S.N.Maheswari and S.K. Maheswari, *Financial Accounting*, 4th Edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting,* 5th Edition, Kalyani Publishers, Ludhiana, 2000.

III B.Tech. I Semester

10BT60501: THEORY OF COMPUTATION

L	T	P	C
4	-	-	4

UNIT–I: INTRODUCTION TO THEORY OF AUTOMATA

Strings, Alphabets, Language, Operations on sets, Definition of an automaton, Description of a Finite Automaton (FA), Transition systems, Properties of transition functions, Acceptability of a string by a finite automaton.

UNIT-II: FINITE AUTOMATA

Deterministic finite automata(DFA), Nondeterministic finite automata(NFA), The language of a DFA, The Language of an NFA, NFA with ϵ-transitions, Equivalence between NFA with and without ϵ-transitions, NFA to DFA conversion, Equivalence between two finite state machines, Finite automata with output-Mealy and Moore machines, Minimization of finite automata.

UNIT-III: REGULAR EXPRESSIONS

Regular sets, Identity rules, Constructing finite automata for a given regular expressions, Conversion of finite automata to regular expressions, Pumping lemma for regular sets, Applications of pumping lemma, Closure properties of regular sets.

UNIT-IV: FORMAL LANGUAGES

Basic definitions and examples, Chomsky classification of languages, Languages and their relation, Languages and automata, Regular grammars- Right linear and Left linear grammars, Equivalence between regular linear grammar and FA.

Context Free Grammars: Definition of context free grammars(CFG), Leftmost and rightmost derivations, The language of a grammar, Sentential forms, Constructing parse trees, The yield of a parse tree, Ambiguous grammars, Removing ambiguity from grammars.

UNIT-V: CONTEXT FREE LANGUAGES

Simplification of CFG, Eliminating useless symbols, Elimination of NULL productions, Elimination of unit productions, Chomsky Normal Form (CNF), Greibach Normal Form(GNF), Pumping lemma for context free languages(CFL).

UNIT-VI: PUSHDOWN AUTOMATA

Definition of pushdown automaton(PDA), The Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic pushdown automaton.

UNIT-VII: TURING MACHINES AND LINEAR BOUNDED AUTOMATA

Turing Machine model, Representation of Turing Machines, Languages acceptability by Turing Machines, Design of Turing Machines, Computable functions, Recursively enumerable languages, Church's hypothesis, Counter machine, Types of Turing Machines, The model of linear bounded automaton(LBA), Turing Machines and type 0 grammar, Linear bounded automata and Languages.

UNIT-VIII: COMPUTABILITY THEORY

LR(k) grammar, Universal Turing Machines, Undecidable problems about Turing Machines, Post's Correspondence Problem, The Classes P and NP, An NP-Complete and NP-Hard Problems.

TEXT BOOK:

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, *Introduction to Automata Theory Languages and Computation*, 2nd Edition, Pearson Education, 2005.

REFERENCE BOOKS:

1. K.L.P. Mishra and N. Chandrashekaran, *Theory of Computer Science-Automata Languages and Computation,* 2nd Edition, PHI, 2003.
2. John C Martin, *Introduction to Languages and the Theory of Computation,* 3rd Edition, Tata McGraw Hill, 2003.
3. Daniel I.A. Cohen, *Introduction to Computer Theory*, 2nd Edition, John Wiley, 2007.

III B.Tech. I Semester

10BT50503: DATABASE MANAGEMENT SYSTEMS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

History of Database Systems, Introduction to DBMS, Database System Applications, Database Systems Versus File Systems, View of Data, Data Models, Database Languages- DDL & DML Commands and Examples of Basic SQL Queries, Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures.

UNIT II: DATABASE DESIGN

Introduction to Database Design and E-R Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the E-R Model, Conceptual Design with the E-R Model, Conceptual Design for Large Enterprises.

UNIT III: THE RELATIONAL MODEL

Introduction to the Relational Model, Integrity Constraints over relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER to Relational, Introduction to Views, Destroying/Altering Tables and Views.

Relational Algebra and Calculus: Preliminaries, Relational Algebra Operators, Relational Calculus – Tuple and Domain Relational Calculus, Expressive Power of Algebra and Calculus.

UNIT IV: SQL: QUERIES, CONSTRAINTS, TRIGGERS

Overview, The form of a Basic SQL Query, Union, Intersect and Except operators, Nested Queries, Aggregate Operators, Null values, Complex Integrity Constraints in SQL, Triggers and Active Databases, Designing Active Databases.(Chapter 5;Sections 5.1-5.9 including subtopics from Text book-1)

UNIT V: SCHEMA REFINEMENT AND NORMAL FORMS

Introduction to Schema Refinement, Functional Dependencies, Reasoning about FDs, Normal Forms – 1NF, 2NF, 3NF, BCNF, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies – 4NF, 5NF, DKNF, Case Studies.

UNIT VI: TRANSACTIONS MANAGEMENT

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability.

UNIT VII: CONCURRENCY CONTROL AND RECOVERY SYSTEM.

Concurrency Control: Lock Based protocols, Time-Stamp Based Protocols, Validation based Protocols, Multiple Granularity, and Deadlock Handling.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Non-volatile Storage, Advanced Recovery Techniques, Remote Backup Systems.

UNIT VIII: OVERVIEW OF STORAGE AND INDEXING

Data on External Storage, File Organizations and Indexing, Index Data Structures, Comparison of File Organizations, Indexes and Performance Tuning.

Tree-Structured Indexing: Intuition for Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Tree Structure.

TEXT BOOK:

1. Raghurama Krishnan, Johannes Gehrke, *Database Management Systems*, 3 ed, Tata McGrawHill, 2007.
2. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, *Database System Concepts,* 5 ed, McGraw-Hill, 2005.

REFERENCE BOOKS:

1. Elmasri Navate, *Fundamentals of Database Systems*, Pearson Education,1994.
2. Peter Rob and Carlos Coronel, *Database Systems Design, Implementation and Management*, 7 ed, 2009.
3. Pranab Kumar Das Gupta, *Database Management System Oracle SQL and PL/SQL*, PHI Learning Private Limited, 2009.

III B.Tech. I Semester

10BT50504: OPERATING SYSTEMS

L	T	P	C
4	-	-	4

UNIT I: OPERATING SYSTEMS OVERVIEW

Introduction, Operating system operations, Process management, Memory management, Storage management, Protection and Security, Distributed Systems, Special purpose systems.
Operating systems structures: Operating system services and Systems calls, System programs, Operating system structure, Operating systems generations.

UNIT II: PROCESS MANAGEMENT

Process concepts, Process state, Process control block, Scheduling queues, Process scheduling, Multithreaded programming, threads in UNIX, Comparison of UNIX and Windows.

UNIT III: CONCURRENCY AND SYNCHRONIZATION

Process synchronization, Critical-section problem, Peterson's Solution, Synchronization Hardware, semaphores, Classic problems of synchronization, Readers and Writers problem, Dining-philosophers problem, Monitors, Synchronization examples(Solaris), atomic transactions. Comparison of UNIX and Windows.

UNIT IV: DEADLOCKS

System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock- bankers algorithm.

UNIT V: MEMORY MANAGEMENT

Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, Allocation of frames, Thrashing, case study-UNIX.

UNIT VI: FILE SYSTEM

Concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and Windows

UNIT VII: I/O SYSTEM

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling algorithms, swap-space management, stable-storage implementation, Tertiary storage structure,

I/O: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT VIII: PROTECTION AND SECURITY

Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights. Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, 7 ed, John Wiley.

REFERENCE BOOKS:

1. Stallings, *Operating Systems, Internals and Design Principles*, 5 ed, Pearson Education, 2006.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2 ed, PHI, 2007.
3. Deitel & Deitel, *Operating systems*, 3 ed, Pearson Education, 2008.
4. Crowley, *Operating systems Oriented Approach*, TMH, 1998.
5. Dhamdhere, *Operating systems*, Second Edition, TMH, 2008.

III B.Tech. I Semester

10BT51501: SYSTEM SOFTWARE

L	T	P	C
4	1	-	4

UNIT - I: INTRODUCTION TO PC ARCHITECTURE

PC Hardware, Segments and Addressing, Registers, Assembly Language Basics, Machine Addressing, Special DEBUG features, Data Definition Directives, Addressing Formats, COM Programs.

UNIT - II: PROGRAM LOGIC AND CONTROL

JMP, LOOP and Conditional Jump Instructions, Boolean operations, Shifting, Rotating.

UNIT - III: KEYBOARD AND SCREEN PROCESSING

String Operations, Arithmetic Operations and Table Processing, Searching, Sorting.

ADVANCED SCREEN AND KEYBOARD PROCESSING: BIOS Interrupt 10H for graphics and text, DOS Interrupt 21H .

UNIT - IV: MACROS

Introduction, Simple Macro definition, Using Parameters and Macros, Using Comments in Macros, Nested Macros and Macro Directives, Intra-segment and Inter-segment Calls, Passing Parameters.

UNIT - V: MACRO PROCESSORS

Macro Instructions, Features of a Macro Facility: Macro Instruction Arguments, Conditional Macro Expansion, Macro Calls within Macros, Macro Instructions defining Macros, Implementation of a Restricted Facility: A Two-Pass Algorithm, A Single-Pass Algorithm

UNIT - VI: ASSEMBLERS

General Design Procedure, Design of Assembler: Statement of Problem, Data Structure, Format of Databases, Algorithm, Look for Modularity, Single Pass Assembler and Two Pass Assembler.

UNIT - VII: LOADERS

Loader Schemes: Compile-and-Go Loaders, General Loader Scheme, Absolute Loaders, Subroutine Linkages, Relocating Loaders, Direct-linking loaders, Design of an Absolute Loader and Direct-Linking Loader.

UNIT - VIII: SYSTEM SOFTWARE TOOLS

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system.

TEXT BOOKS:

1. Peter Abel, *IBM PC Assembly Language and Programming,* 5th Edition, PHI.
2. John J Donovan, *Systems Programming,* McGraw Hill.

REFERENCE BOOKS:

1. Dhamdhere, *Operating Systems and Systems Programming,* PHI.
2. Leland L. Beck, *System Software - An Introduction to Systems Programming*, 3rd Edition.

III B.Tech. I Semester

10BT51502: OBJECT ORIENTED SOFTWARE ENGINEERING

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO SOFTWARE ENGINEERING

The evolving role of software, Changing Nature of Software, Software myths, Software engineering- A layered technology, a process framework.

Software Life Cycle Models: Waterfall, RAD, Spiral, Open-source, Agile process, CMM levels.

UNIT – II: PLANNING & ESTIMATION

Product metrics, Estimation- LOC, FP, COCOMO models.

Project Management: Planning, Scheduling, Tracking.

UNIT – III: MODELING WITH UML

Basic Building Blocks of UML, A Conceptual Model of UML, Basic Structural Modeling, UML Diagrams.

UNIT – IV: REQUIREMENTS ENGINEERING

Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

Building The Analysis Model: Requirement Analysis, Analysis Modeling Analysis, Data Modeling Concepts, Object Oriented Analysis, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Based Modeling, Creating a behavioral Modeling.

UNIT – V: DESIGN ENGINEERING

Design process and Design quality, Design concepts, the design model.

Creating An Architectural Design**:** software architecture, Data design, Architectural styles and patterns, Architectural Design.

Object-Oriented Design: Objects and object classes, An Object- Oriented design process, Design evolution.

UNIT – VI: TESTING STRATEGIES

A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging, Object Oriented Testing Methods.

UNIT – VII: METRICS FOR PROCESS AND PRODUCTS

Software Measurement, Metrics for software quality.

Risk Management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT-VIII: QUALITY MANAGEMENT

Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:

1. Roger S. Pressman, *Software Engineering*, *A Practitioner's Approach*, 6 ed, McGraw Hill International Edition, 2005.
2. Bernd Bruegge, *Object Oriented Software Engineering,* 2nd Edition, Pearson Education.
3. Grady Booch, *Object-Oriented Analysis and Design with Applications*, 2nd Edition, Addison-Wesley Professional, 2005.

REFERENCE BOOKS:

1. Sommerville, *Software Engineering,* 7th Edition, Pearson Education.
2. K.K.Aggarwal & Yogesh Singh, *Softwae Engineering,* New Age International Publishers.
3. James F. Peters, *Software Engineering, an Engineering Approach,* Witold Pedrycz John Wiley.
4. Shelly Cashman Rosenblatt, *Systems Analysis and Design,* 4th Edition, Thomson Publications.
5. Waman S Jawadekar, *Software Engineering Principles and Practice,* The McGraw-Hill Companies.

III B.Tech. I Semester

10BT51511: OPERATING SYSTEMS AND SYSTEM SOFTWARE LAB

L	T	P	C
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I. OPEATING SYSTEMS:

1. Simulate the following CPU scheduling algorithms:
a) FCFS b) Round Robin c) SJF d) Priority
use the following set of processes, compare the performance of above scheduling policies.

Process Name	Arrival Time	Processing Time
A	0	3
B	1	5
C	3	2
D	9	5
E	12	5

2. Simulate the following file allocation strategies
a) Sequential b) Indexed c) Linked
consider the disk consists 20 blocks and file consists 5 records

3. Simulate Multi programming with fixed number of tasks and Multi programming with variable number of tasks.
The size of the memory is 1000K. Operating system size is 200K. No. of processors are P1, P2, P3 with sizes 150K, 100K and 70K.

4. Simulate the following file organization Techniques.
a) Single Level Directory b) Two Level c) Hierarchical
d) DAG

5. Simulate Bankers algorithm for Deadlock avoidance. Consider no.of resources are three and Jobs are four.

6. Write a program to simulate Deadlock prevention.
No.of Resource types are three and jobs are there.

7. Write a Program to simulate the following page replacement algorithms
a) FIFO b) LRU c) LFU d) Optimal
consider no.of Frames are three.
Reference string is 2 3 2 1 5 2 4 5 3 2 4 2 4 5 3

8. Simulate paging technique of Memory Management.

II. SYSTEM SOFTWARE:

1. Accepting and Displaying Names using Text Processing

2. Creation of Symbol Table

3. Pass One of Two Pass Assembler

4. Pass Two of Two Pass Assembler

5. Implementation of Single Pass Assembler

III B.Tech. I Semester

10BT51512: DATABASE MANAGEMENT SYSTEMS LAB

L	T	P	C
-	-	3	2

DESCRIPTION OF SALES DATABASE

ABC is a company operating in the country with a chain of shopping centers in various cities. Everyday large numbers of items are sold in different shopping centers. The Sales database comprises of various tables like CUST, PROD, SALES_DETAIL, STATE_NAME with the following schemas.

CUST TABLE

Name	Type	Remark
CID	VARCHAR2(6)	PRIMARY KEY
CNAME	VARCHAR2(10)	
CCITY	VARCHAR2(8)	

PROD TABLE

Name	Type	Remark
PID	VARCHAR2(6)	PRIMARY KEY
PNAME	VARCHAR2(6)	
PCOST	NUMBER(4,2)	
PPROFIT	NUMBER(3)	

SALES_DETAIL

Name	Type	Remark
CID	VARCHAR2(6)	COMPOSITE PRIMARY KEY
PID	VARCHAR2(6)	COMPOSITE PRIMARY KEY
SALE	NUMBER(3)	
SALEDT	DATE	COMPOSITE PRIMARY KEY

STATE_NAME

Name	Type	Remark
CCITY	VARCHAR2(8)	PRIMARY KEY
STATE	VARCHAR2(15)	

1. ER MODEL

Draw an ER Model indicating many to many relationship between CUST vs PROD. Show the Cardinality Ratio between PROD and SALES_DETAIL is one-to-many because one product can be sold multiple times. Similarly show the Cardinality Ratio between CUST and SALES_DETAIL is one-to-many because one customer can purchase many products. Indicate CID# and PID# are unique in CUST and PROD entity respectively, where as CID and PID in SALE_DETAIL entity may occur many times.

Represent the ER Model in Tabular Form.

2. NORMALIZATION

In the above relations the following Functional Dependencies exist:

CID → CNAME, CCITY, STATE

PID → PNAME, PCOST, PPROFIT

CID, PID, SALEDT → SALE

CID#	CNAME	CCITY	STATE	PID#	PNAME	PCOST	PROFIT	SALE	SALEDT#
C1	RAVI	HYD	AP	P1	CD	10		5	14-JUL-10
				P3	DVD	20	10	2	14-JUL-10
				P3	DVD	20	10	3	20-AUG-09

Normalize the above table into 1NF, 2NF and 3NF. And handle Insert, Delete and Update anamolies.

3. DATA RETRIEVAL

a) Write a query to display all columns of CUST table.

b) Write a query to display pname of all records. Sort all records by pname. (use order by clause)

c) Write a query to display cname and ccity of all records. Sort by ccity in descending order.

d) Write a query to display cname, ccity who lives in mysore.

e) Write a query to display cname, pname, sale, saledt for all customers.

f) Write a query to display cname who have purchased Pen.

g) Write a query to display saledt and total sale on the date labeled as sale of all items sold after 01-sep-2010.

h) Write a query to display saledt and total sale on the date labeled as sale of all items other than DVD.

i) Write a query to display cname and ccity of all customers who live in Kolkata or Chennai.

4. USE OF DISTINCT, BETWEEN, IN CLAUSE, LIKE OPERATOR, DUAL

a) Write a query to display the pname and pcost of all the customers where pcost lies between 5 and 25.
b) Find the product ids in sale_detail table(eliminating duplicates).
c) Write a query to display distinct customer id where product id is p3 or sale date is '18-mar-2011'.
d) Write a query to display cname, pid and saledt of those customers whose cid is in c1 or c2 or c4 or c5.
e) Write a query to display cname, pid, saledt of those customers whose pid is p3 or sale date is '20-dec-2009'.
f) Write a query to display system date.
g) Write a query to display all records of prod table in which first and third character of pname is any character and second character is 'E'.
h) Write a query to display all cname which includes two 'A' in the name.

5. CONSTRAINTS

a) Implement table level and Column level constraints like NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK.

6. SINGLE ROW FUNCTIONS: DATE FUNCTION

a) Write a query to display the system date by rounding it to next month.
b) Write a query to display the system date by rounding it to next year.
c) Write a query to display the last date of the system date.
d) Write a query to display the next date of system date which is Friday.
e) Write a query to display sale date and date after 02 months from sale date.
f) Write a query to display system date, sale date and months between two dates.
g) Write a query to display the greatest date between sale date and system date, name it as BIG, also display sale date and SYSDATE.

h) Write a query to display the least date between sale date and system date name it as SMALL, also display sale date and SYSDATE.

7. SINGLE ROW FUNCTIONS: NUMERIC AND CHARACTER FUNCTION

a) Write a query to display the product name along with the rounded value of product cost for product name is "Pencil".
b) Write a query to display product cost along with MOD value if divided by 5.
c) Write a query to display cname in uppercase, lowercase, titlecase from cust table where customer name is "rohan".
d) Write a query to display all concatenated value of cname, ccity by converting cname into titlecase and ccity into uppercase.
e) Write a query to display the first 3 characters of cname.
f) Write a query to display the position of 'M' in the cname of the customer whose name is "SAMHITA".
g) Write a query to display the length of all customer names.
h) PAD # character in left of product cost to a total width of 5 character position.

8. GROUP FUNCTIONS AND SET FUNCTIONS

a) Write a query to display the total count of customer.
b) Write a query to display the minimum cost of product.
c) Write a query to display average value of product cost rounded to 2nd decimal places.
d) Write a query to display product name with total sale detail in descending order.
e) Write a query to display product name, sale date and total amount collected for the product.
f) Write a query to display sale date and total sale date wise which was sold after "14-jul-08".
g) Write a query to display the customer name who belongs to those places whose name is having I or P.
h) Write a query to display customer name who belongs to a city whose name contains characters 'C' and whose name contains character 'A'.
i) Write a query to display the customer name who does not belong to PUNE.

9. PL/SQL

a) Write a PL/SQL program to find largest number among three. (Hint: Use Conditional Statement)

b) Write a PL/SQL program to display the sum of numbers from 1 to N using for loop, loop…end and while…loop.

10. SQL CURSOR

a) Write a PL/SQL program to display the costliest and cheapest product in PROD table.

b) Write a PL/SQL program which will accept PID and display PID and its total sale value i.e. sum.

11. FUNCTIONS

a) Write a function that accepts two numbers A and B and performs the following operations.

   i. Addition
   ii. Subtraction
   iii. Multiplication
   iv. Division

b) Write a function that accepts to find the maximum PCOST in PROD table.

12. PROCEDURES

a) Write a procedure that accepts two numbers A and B, add them and print.

b) Write procedures to demonstrate IN, IN OUT and OUT parameter.

13. TRIGGER

a) Develop a PL/SQL program using BEFORE and AFTER triggers.

14. CURSOR

a) Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

III B.Tech. I Semester

10BT4HS02: ADVANCED ENGLISH COMMUNICATION SKILLS

(AUDIT COURSE)

L	T	P	C
-	3	-	-

UNIT I: VOCABULARY BUILDING:

Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.

Functional English: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT II: READING COMPREHENSION

Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

UNIT III: ACADEMIC ESSAY WRITING

Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

Unit IV: TECHNICAL REPORT WRITING

Types of formats and styles, Subject-matter, Subject-organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

Unit V: CAREER SKILLS

Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.

UNIT VI: RESUME WRITING

Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

UNIT VII : GROUP DISCUSSION

Dynamics of group discussion, Intervention, Summarizing, Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

Unit VIII: INTERVIEW SKILLS

Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, "Effective Technical Communication Skills", Tata McGraw Hill, New Delhi, 2005.
2. Meenakshi Raman and Sangetha Sharma, "Technical Communi cation, Principles and Practice", Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, "Secrets of Success in Interviews", Crucial Books, Secunderabad, 2007.
4. M. Ashraf Rizvi, "Resumes and Interviews - The Art of Wining",Tata Mc Graw Hill, New Delhi, 2008.
5. Gopala Swamy Ramesh and Mahadevan Ramesh, "The Ace of Soft Skills: Attitude, Communication and Etiquette for Success", Pearson Education, New Delhi, 2009.

SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.

III B.Tech. II Semester

10BT70501: PRINCIPLES OF COMPILER DESIGN

L	T	P	C
4	1	-	4

UNIT –I: INTRODUCTION TO COMPILER

Definition of compiler, interpreter and its differences, The phases of a compiler, Role of lexical analyzer, Regular expressions, Finite automata, From regular expressions to finite automata, Pass and phases of translation, bootstrapping, LEX-lexical analyzer generator.

UNIT –II: PARSING

Parsing, Role of parser, Context free grammar, Derivations, Parse trees, Ambiguity, Elimination of left recursion, Left factoring, Eliminating ambiguity from dangling-else grammar, Classes of parsing, Top-down parsing- Backtracking, Recursive-descent parsing, Predictive parsers, LL(1) grammars.

UNIT –III: BOTTOM-UP PARSING

Definition of bottom-up parsing, Handles, Handle pruning, Stack implementation of Shift-Reduce parsing, Conflicts during Shift-Reduce parsing, LR grammars, LR parsers-Simple LR, Canonical LR and Look Ahead LR parsers, Error recovery in parsing, Parsing ambiguous grammars, YACC-automatic parser generator.

UNIT –IV: SYNTAX-DIRECTED TRANSLATION

Syntax directed definition, Construction of syntax trees,S-attributed and L-attributed definitions, Translation schemes, Emitting a Translation.

Intermediate Code Generation: Intermediate forms of source programs- Abstract syntax tree, Polish notation and Three address code, Types of three address statements and its implementation, Syntax directed translation into three-address code, Translation of simple statements, Boolean expressions and flow-of-control statements.

UNIT –V: TYPE CHECKING

Definition of type checking, Type expressions, Type systems, Static and dynamic checking of types, Specification of a simple type checker, Equivalence of type expressions, Type conversions, Overloading of functions and operators.

UNIT –VI: RUN TIME ENVIRONMENTS

Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing, Symbol tables, Language facilities for dynamic storage allocation.

UNIT –VII: CODE OPTIMIZATION

Organization of code optimizer, Basic blocks and flow graphs, Optimization of basic blocks, The principal sources of optimization, The DAG representation of basic block, Global data flow analysis.

UNIT –VIII: CODE GENERATION

Machine dependent code generation, Object code forms, The target machine, A simple code generator, Register allocation and assignment, Peephole optimization.

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, *Compilers-Principles, Techniques and Tools,* Pearson Education, 2004.

REFERENCE BOOKS:

1. Alfred V. Aho, Jeffrey D. Ullman, *Principles of Compiler Design,* Pearson Education, 2001.
2. Kenneth C. Louden, *Compiler Construction-Principles and Practice,* Thomson, 1997.
3. K.L.P. Mishra and N. Chandrashekaran, *Theory of Computer Science - Automata Languages and Computation,* 2nd Edition, PHI, 2003.
4. Andrew W. Appel, *Modern Compiler Implementation C,* Cambridge University Press, 2004.

III B.Tech. II Semester

10BT40503: PRINCIPLES OF PROGRAMMING LANGUAGES

L	T	P	C
4	-	-	4

UNIT-I: PRELIMINARY CONCEPTS

Concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms: Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation, Compilation and Virtual Machines, Programming environments, Introduction to Syntax and Semantics.

UNIT-II: DATA TYPES

Introduction, primitive, character, String, user-defined, array, associative arrays, records, set, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT-III: EXPRESSIONS AND STATEMENTS

Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures: Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT-IV: SUBPROGRAMS AND BLOCKS

Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co-routines.

UNIT-V: ABSTRACT DATA TYPES

Abstractions and encapsulation, introductions to data abstraction, design issues, Concept of Object, Inheritance, Derived classes, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95, Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

UNIT-VI: EXCEPTION HANDLING

Exceptions, exception Propagation, Exception handler in Ada, C++ and Java. Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT-VII: FUNCTIONAL PROGRAMMING LANGUAGES

Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages, Database Query Languages(using SQL as Example).

UNIT-VIII: SCRIPTING LANGUAGES

Case Study : Python, PERL,PHP,ABAP – Key concepts ,Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

TEXT BOOK:

1. Robert W. Sebesta, *Concepts of Programming Languages,* 8th Edition, Pearson Education, 2008.
2. D.A. Watt, *Programming Language Design Concepts,* Wiley Dreamtech, RP-2007.

REFERENCE BOOKS:

1. A.B. Tucker, R.E. Noonan, *Programming Languages,* 2ed, TMH.
2. K.C. Louden, *Programming Languages,* 2ed, Thomson, 2003.
3. Patric Henry Winston and Paul Horn, *LISP*, 2ED, Pearson Education.
4. M. Lutz, *Programming Python,* 3ed, O'Reilly, SPD, RP-2007.

III B.Tech. II Semester
10BT51202: **COMPUTER GRAPHICS**

L	T	P	C
4	1	-	4

UNIT –I: INTRODUCTION TO COMPUTER GRAPHICS

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

UNIT –II: OUTPUT PRIMITIVES

Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT –III: 2-D GEOMETRICAL TRANSFORMS

Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT –IV: 2-D VIEWING

The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT –V: 3-D OBJECT REPRESENTATION

Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT –VI: 3-D GEOMETRIC TRANSFORMATIONS

Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT –VII: VISIBLE SURFACE DETECTION METHODS:

Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

UNIT –VIII: COMPUTER ANIMATION

Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

Image Manipulation and Storage: Digital image file formats, Image compression standard - JPEG.

TEXT BOOK:

1. Donald Hearn and M. Pauline Baker, *Computer Graphics C Version*, Pearson Education, 2006.
2. Foley, VanDam, Feiner and Hughes, *Computer Graphics Principles and practice in C,* Pearson Education, 2nd Edition, 1996.

REFERENCE BOOKS:

1. Sten Harrington, *Computer Graphics,* TMH, 1982.
2. Neuman and Sproul, *Principles of Interactive Computer Graphics,* TMH, 2005.
3. David F Rogers, *Procedural elements for Computer Graphics,* 2nd edition, Tata Mc Graw Hill, 2001.
4. Zhignad xiang, Roy Plastock, Schaum's outlines, *Computer Graphics,* 2nd edition, Tata Mc-Graw hill edition, 2004.

III B.Tech. II Semester
10BT71201: **WEB PROGRAMMING**

L	T	P	C
4	1	-	4

UNIT –I: INTRODUCTION TO HTML

Basic HTML, the document body, text, hyperlinks, lists, tables, images, frames, forms, Cascading Style Sheets: Introduction, simple examples, defining your own styles, properties and values in styles, formatting blocks of information, layers.

UNIT –II: JAVA SCRIPT

Basics, variables, string manipulation, arrays, functions, objects in java script, introduction to DHTML.

UNIT –III : EXTENSIBLE MARKUP LANGUAGE (XML)

XML basics, Document Type Definition, XML Schema, Presenting XML, Introduction to DOM and SAX parsers.

UNIT –IV: SERVLET PROGRAMMING

Introduction, servlet implementation, servlet configuration, servlet exceptions, servlet lifecycle, Requests and Responses: ServletRequest, ServletResponse, HttpServlet-Request, HttpServletResponse interfaces, cookies, session creation and tracking using HttpSession interface.

UNIT –V: DATABASE PROGRAMMING WITH JDBC

Database drivers, the java.sql package: connection management, database access, data types, database metadata, exceptions and warnings, loading a database driver and opening connections, establishing a connection, creating and executing sql statements querying the database, prepared statements, mapping sql types to java, transaction support, save points.

UNIT –VI: INTRODUCTION TO JSP

Introducing JSP, JSP directives, scripting elements, standard actions, implicit objects, scope and JSP pages as XML documents, introduction to MVC architecture.

UNIT –VII: JSP TAG EXTENSIONS

Introduction to javabean, advantages of javabean, introspection, getter and setter methods, introduction to JSP tag extensions, a simple tag, anatomy of a tag extension, writing tag extensions.

UNIT –VIII: JSP APPLICATIONS WITH TAG LIBRARIES

Benefits of using custom tag libraries, introducing the JSP Standard Tag Library (JSPTL), getting started with the JSPTL, integrating the JSPTL into your JSP page, the JSPTL tags.

TEXT BOOK:

1. Chris Bates, *Web Programming Building Internet Applications,* 2nd Edition, Wiley, 2007.
2. Subramanyam Allamaraju and Cedric Buest, *Professional Java Server Programming J2EE,* 1.3 edition, SPD (apress), 2004.

REFERENCE BOOKS:

1. Dietel and Dietel, *Internet and World Wide Web How to Program,* 4th Edition, PHI, 2008.
2. David Hunter, A. Watt and Jeff Rafter, *Beginning XML,* Wiley Dreamtech, 2004.
3. J. McGovern, Rahim Adatia and Yakov Fain, *J2EE 1.4 Bible,* Wiley Dreamtech, 2004.
4. Hans Bergsten, *Java Server Pages,* 3rd Edition, SPD O'Reilly, 2010.

III B.Tech. II Semester

10BT61202: COMPUTER NETWORKS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

Network Applications, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Example Networks: Novell Network, X.25, Internet.

UNIT II: THE PHYSICAL LAYER

Theoretical Basis for communication, Guided Transmission media, Wireless Transmission, The public switched telephone Networks, Mobile telephone system.

UNIT III: THE DATA LINK LAYER

Design Issues, Error detection and correction-CRC, Hamming codes, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols: HDLC, The Data Link Layer in the Internet.

UNIT IV: THE MEDIUM ACCESS SUBLAYER

Channel Allocations problem, Multiple Access protocols: ALOHA, CSMA, CSMA/CD protocols, Collision free protocols, Limited contention protocols, Ethernet, DLL Switching.

UNIT V: THE NETWORK LAYER

Network Layer Design Issues, Routing Algorithms: Shortest path, Flooding, Distance vector, Hierarchical, Broadcast and Multicast, Congestion Control Algorithms, Internetworking, The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, Ipv6 Main Header.

UNIT VI: THE TRANSPORT LAYER

Transport Service, Elements of transport protocol, Internet Transport layer protocols: UDP and TCP.

UNIT VII: THE APPLICATION LAYER

DNS: The Domain name system, Electronic Mail, World Wide Web: Architectural Overview, Dynamic Web Document, HTTP.

UNIT VIII: IEEE STANDARDS AND NETWORK SECURITY

Introduction to IEEE standards, Wi-Fi: 802.11b, Bluetooth: 802.15, 3G: 802.16, 4G: 802.16m, Wi-Max: 802.16a.

Introduction to Network Security: Cryptography - Substitution Techniques, Transposition Techniques.

TEXT BOOK:

1. A.S. Tanenbaum, *Computer Networks,* 4ed, Pearson Educaiton/ PHI.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, *Data Communication and Networking,* Tata McGraw-Hill, 2004.
2. Peterson and Davie, *Computer Networks,* 2ed, Morgan Kaufmann.
3. Kurose, Ross, *Computer Networking,* Pearson Education, 2010.
4. Leon-Garcia and Widjaja, *Communication Networks,* 2ed TMH.
5. S. Keshay, *An Engg. Approach to Computer Networking,* Addison Wesley, 1997.

III B.Tech. II Semester

10BT61501: MODELING AND SIMULATION

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

A Systematic approach to performance Evaluation, Selecting an Evaluation Technique, Selecting performance Metrics, Commonly used Performance Metrics, Classification of Performance Metrics.

Commonly Used Distributions: Bernoulli distribution, Binomial distribution, Beta, Chi-Square, Erlang, Exponential, F ,Geometric, Gamma, normal, poisson, Pascal, uniform, weibull distributions, Relationship among distributions.

UNIT-II: INTRODUCTION TO QUEUEING THEORY:

Queueing Notation, Rules for all Queues, little's law, Types of stochastic processes, Birth-Death processes,M/M/1 Queue ,M/M/m Queue, M/M/m /B Queues with finite buffers, Results for other Queueing systems;

Open and Closed Queueing Networks, Product form Networks, Queueing Network Models of computer System.

Operational Laws: utilization law, Forced flow law, little's law, general response time law, intractive response time law, Bottleneck analysis

UNIT-III:

Types of work loads: Addition Instruction, Instruction metrics, kernels, Synthetic Programs, Application Benchmarks, Popular Benchmarks.

Work load selection: Services exercised, Level of detail, representativeness, Timeliness, other considerations.

Workload Characterization Techniques: Terminology, Averaging, specifying dispersion, single parameter histograms, multi parameter histograms, principle –Component analysis, markov models, Clustering

UNIT-IV:

Monitors: Monitor terminology, classification, software, hardware monitors, Software versus Hardware monitors, Firmware and hybrid monitors, distributed system monitors, program execution monitors, techniques for improving program performance, accounting logs, analysis and inter presentation of accounting log data.

UNIT-V:

Summarizing measured data: Basic probabilities and statistics concepts, summarizing data by a single number, selecting among

the mean, median, mode, geometric mean, harmonic mean, mean of a ratio, summarizing variability, selecting the index of dispersion, determining distribution of data.

Sample VS Population, Confidence interval for the mean, testing for zero mean, comparing two alternatives, confidence level to use, hypothesis testing versus Confidence intervals, one side confidence intervals, confidence intervals for proportions, determining sample size.

Linear Regression Models: Definition of a good model, estimation of model parameters, allocation of variation ,standard deviation of errors, confidence intervals for predictions, visual tests for verifying the regression, Assumptions.

UNIT-VI:

Experimental Design: Types of experimental design, 22 factorial designs, computation of effects, sign table method for calculating effects, allocation of variation, general 2k factorial design,

22r factorial designs, computation of effects, estimation of experimental errors, allocation of variation, confidence intervals for effects and predicated responses, visual tests for verifying the assumptions multiplicative models for 22 r experiments, general 2k r factorial design.

Preparing the sign table for 2k-p design, confounding ,Algebra of confounding, design resolution.

UNIT-VII: SIMULATION

Modeling: The nature of simulation, Systems, Models and simulation, Discrete-Event Simulation, Simulation Of inventory System, Other Types Of Simulation, Simulation Software

Introduction, General principles, Random-Number Generation, Random-Variate Generation.

UNIT-VIII: INPUT MODELING

Verification and Validation of Simulation Models, Output Analysis for a Single Model, Comparison and Evaluation of Alternative System Designs, Simulation of Computer Systems.

TEXT BOOKS:

1. Raj Jain, The Art of Computer Systems Performance Analysis: Techniques for Experimental Design, Measurement, Simulation, and Modeling, Wiley-India, 2008

2. Jerry Banks, John S Carson II, Barry L. Nelson and David M. Nicol.Discrete Event System Simulation, 3rd edition, Pearson Education/PHI.

REFERENCE BOOKS:

1 E.D. Lazowska, J. Zahorjan, G.S. Graham and K.C. Sevcik, Quantitative System Performance, Prentice-Hall, 1984

III B.Tech. II Semester

10BT61511: COMPILER DESIGN AND COMPUTER NETWORKS LAB

L	T	P	C
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PART - A: COMPILER DESIGN

1. Design a Lexical analyzer for the given language. The lexical analyzer should ignor redundant spaces, tabs and new lines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict length to some reasonable value.

2. Implement the lexical analyzer using FLEX or LEX or other lexical analyzer generating tools.

3. Generate predictive parsing table for the given grammar.

E1→E#,
E→TA,
A→∈ | + TA,
T→FB,
B→∈ | * FB,
F→ (E) | I

4. design predictive parser for the above grammar.

5. design LALR bottom up parser for the below language.

Grammar: S -> S$
S -> aA | b | cB | d
A -> aA | b
B -> cB | d

Input Word: aaab$

6. Design a simple calculator using: YAAC

PART - B: COMPUTER NETWORKS

1. Implement the data link layer framing methods such as character, Character stuffing and bit stuffing.

2. Implement on a data set of characters the three CRC polynomials - CRC 12, CRC 16 and CRC CCIP.

3. Implement Dikkstra's algorithm to compute the Shortest path thru a graph.

4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm.

5. Take an example subnet of hosts. Obtain broadcast tree for it.

6. Take a 64 bit playing text and encrypt the same using DES algorithm.

7. Write a progrma to break the above DES coding.

III B.Tech. II Semester

10BT61512: OOAD AND WEB PROGRAMMING LAB

L	T	P	C
-	-	3	2

PART-A: OOAD

Case studies given below should be Modeled using Rational Rose tool in different views i.e Use case view, logical view, component view, Deployment view.

CASE STUDY 1: LIBRARY INFORMATION SYSTEM

Problem Statement:

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned by the library that person is notified. The library can easily create, update and delete information about the titles, members, loans and reservations in the systems.

CASE STUDY 2: A POINT OF SALE (POS) SYSTEM

Problem Statement:

A POS System is a computerized application used to record sales and handle payments; it is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third-party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services and temporarily unavailable they must still be of capturing sales and handling at least cash payments.

A POS system must support multiple and varied client – side terminals and interfaces such as browser, PDA's, touch – screens.

CASE STUDY 3: AUTOMATED TELLER MACHINE (ATM)

Problem Statement:

Software is designed for supporting a computerized ATM banking network. All the process involved in the bank is computerized these days. All the accounts maintained in the bank and also the transactions effected, including ATM transactions are to be processed by the computers in the bank. An ATM accepts a relevant cash card, interacts with user, communicates with the central system to carry out the transaction, dispenses cash, and prints receipts. The system to be designed and implemented must include appropriate record keeping and security provisions. The system must handle concurrent access to the same account.

CASE STUDY 4: ONLINE TICKET RESERVATION FOR RAILWAYS

Problem Statement:

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, date of journey, destination, class of train etc. The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes i.e. Sleeper class, First class and the AC compartment. Design the application for the above problem description.

CASE STUDY 5: RECRUITMENT PROCEDURE FOR SOFTWARE INDUSTRY

Problem Statement:

In the software industry the recruitment procedure is the basic thing that goes in the hand with the requirement as specified by the technical management team. HR first gives an advertisement in leading Newspapers, Journals, Weeklies and Websites. The job seekers can apply for it through by Post or by e-mail to the company.

The technical skill and the experience of the candidates are reviewed and the short listed candidates are called for the interview. There may be different rounds for interview like the written test, technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidates names are displayed. Mean while HR gives all the details about the salary, working hours, terms and conditions and the retirement benefit to the candidate.

CASE STUDY 6: DESIGN A STUDENT REGISTRATION SYSTEM

Problem Statement:

Each student has access to his or her course and grade information only and must be authenticated prior to viewing or updating the information. A course instructor will use the system to view the list of courses he or she is assigned for a given semester or has taught previously, view the list of students registered for the course(s) he or she is teaching, and record final grades for each student in the course(s). TA assignments will also be viewable through this system. Instructors must also be authenticated prior to viewing or updating any information.

CASE STUDY 7: ONLINE AUCTION SALES

Problem Statement:

The online auction system is a design about a website where sellers collect and prepare a list of items they want to sell and place it on the website for visualizing. To accomplish this purpose the user has to access the site. Incase it's a new user he has to register. Purchaser's login and select items they want to buy and keep bidding for it. Interacting with the purchasers and sellers through messages does this. There is no need for customer to interact with the sellers because every time the purchasers bid,

the details will be updated in the database. The purchaser making the highest bid for an item before the close of the auction is declared as the owner of the item. If the auctioneer or the purchaser doesn't want to bid for the product then there is fixed cutoff price mentioned for every product. He can pay that amount directly and own the product. The purchaser gets a confirmation of his purchase as an acknowledgement from the website. After the transition by going back to the main menu where he can view other items.

PART-B: WEB PROGRAMMING

List of Practicals:

1. Design the following static web pages required for an online book store web site.

A. Home Page:

The static home page must contain the following three frames:

Top frame: Logo and the book store name and links to Home page, about us page, collections page, contact us page and cart page.

Left frame: At least four links for navigation, which will display the book catalogue of respective areas. For e.g.: when you click the link **"Computer"** the catalogue for computer books should be displayed in the right frame.

Right frame: The pages of the links in the left and top frame must be loaded here. Initially it will display the description of the web site, i.e., page of the Home link will be loaded.

<table>
<tr><td>Logo</td><td colspan="4">Name of the Book Store</td></tr>
<tr><td>Home</td><td>About Us</td><td>Collections</td><td>Contact Us</td><td>Cart</td></tr>
<tr><td>Computer
Electrical
Electronic
Bio-Tech</td><td colspan="3">Description of the Web Site</td><td>Sign In
New User?
Sign Up</td></tr>
</table>

B. Login Page:

The login page looks like as follows (Link this page to Sign In link):

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	User ID: [ ] Password: [ ] Submit Reset New User? Sign Up			

2. Design the following static web pages for an online book store web site.

A. Catalogue Page:

The catalogue page should contain the details of books available in the web site. The details are as follows:

a. Snap shot of cover page b. Text book name
c. Author name d. Publisher
e. Price f. Add to cart link.

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	Computer Books			

Cover Page	Book Details	Price	Remarks
	Book : XML Bible Author : Winston Publication : Wiley	INR 399.00	Add to Cart
	Book : Multimedia Author : Ze Nian Li Publication : Prearson	INR 455.00	Add to Cart
	Book : HTML Author : Watson Publication : SPD	INR 355.00	Add to Cart

B. Registration Page:

Design the Registration page with the following fields (Link this page to Sign Up link).

a. First Name
b. Last Name
c. User ID
d. Password
e. Confirm Password
f. Gender
g. Date of Birthh. Address
i. Postal Code
j. Linguistics
k. Mobile No.
l. Email-ID

C. Cart Page:

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	**Selected Books** Book Name Price Quantity Amount XML bible 399.00 2 INR 798.00 HTML 355.00 1 INR 355.00 **Total amount (INR): 1153.00**			

3. Write a JavaScript code to validate the following fields of the registration page.

a. First Name/Last Name - should contain only alphabets and the length should not be less than 3 characters.
b. User ID - It should contain combination of alphabets, numbers and _. It should not allow spaces and special symbols.
c. Password - It should not be less than 8 characters in length.

4. Write a JavaScript code to validate the following fields of the registration page.

a. Date of Birth - It should allow only valid date; otherwise display a message stating that entered date is invalid. Ex. 29 Feb. 2009 is an invalid date.
b. Mobile No. - It should allow only numbers and total number of digits should be equal to 10.

c. E-mail id - It should allow the mail id with the following format:
Ex. mailid@domainname.com

5. Apply the following styles to static pages of online book store web site using CSS (Cascading Style Sheets):

a. Fonts and Styles: font-family, font-style, font-weight and font-size
b. Backgrounds and colors: color, background-color, background-image and background-repeat
c. Text: text-decoration, text-transformation, text-align and text-indentation, text-align
d. Borders: border, border-width, border-color and border-style
e. Styles for links: A:link, A:visited, A:active, A:hover
f. Selectors, Classes and Layers.

6. Write an XML file which includes the following:

a. Title of the book
b. Author of the book
c. ISBN number
d. Name of the publisher
e. Edition
f. Price

i. Write a Document Type Definition (DTD) or XML Schema to validate the above XML file.
ii. Display the contents of the XML file with the following format using XSL.

The contents should be displayed in a table. The header of the table should be in color grey, and the author names should be displayed in red color, bold and capitalized. Use your own colors for remaining fields.

7. A. Deploy web pages of online book store web site using Apache Tomcat web server and then navigate them thorough the default port number of the tomcat web server.

B. Write a Java Servlet program for displaying the system date.

C. Write a Java Servlet program to red user name and his/her favorite color from the html form.

Display the name of the user in green color and set user favorite color as a background color to the web page.

8. Write a Java Servlet program to read the user id and password entered in the Login form and authenticate with the values (user id and passwords) available in the cookie and web.xml file. If he/she is a valid user (i.e., user id and password match) you should welcome him/her by user id otherwise you should display a message stating that you are not an authorized user. Use the following methods for storing user id's and passwords:

A. Using Cookes - Assume four user id's user1, user2, user3 and user4 and their passwords pwd1, pwd2, pwd3 and pwd4 respectively. Create four cookies on four user id's and passwords.

B. Initialization Parameters in web.xml - Store the user id's and passwords in the web.xml file and access them through the servlet by using the getInitParameters() method.

9. Write a Java Servlet or JSP to store user details (entered in the Registration Form) into the database using JDBC. Use any RDBMS as backend for storing user details.

10. Write a Java Servlet or JSP to authenticate the user by reading user id and password entered in the Login form. Compare User id and password values with user id's and passwords stored at database. If he/she is a valid user (i.e., user id and password match) you should welcome him/her by name (first name + last name), otherwise you should display a message stating that you are not an authorized user.

11. A. Write a Java program for storing books details like Name of the text book, author, publisher, edition and price into the database using JDBC. Store books in database based on the category (i.e., Computer/Electrical/Electronic/Bio-Tech).

B. Write a Java servlet or JSP for updating catalogue page to extract books details from the database and then display them in tabular format using JDBC.

12. HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalogue page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time (i.e., from different systems in the LAN using the IP-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated. Modify your catalogue and cart pages to achieve the above mentioned functionality using sessions.

IV B.Tech. I Semester

10BT71501: **NETWORK PROGRAMMING**

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO NETWORK PROGRAMMING

OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT-II: SOCKETS

Address structures, value result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets -Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT-III: TCP CLIENT SERVER

Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT-IV: I/O MULTIPLEXING AND SOCKET OPTIONS

I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket options.

UNIT-V: ELEMENTARY UDP SOCKETS

Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT-VI: ELEMENTARY NAME AND ADDRESS CONVERSIONS

DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT-VII: IPC

Introduction, Pipes, popen and pclose functions, FIFO's, streams and messages, System V IPC: IPC_Perm Structure, IPC Permissions, Creating and Opening IPC Channels, Message queues (msgget, msgsnd, msgrcv, msgctl Functions), Shared Memory (shmget, shmat, shmdt, shmctl Functions).

UNIT-VIII: **REMOTE LOGIN**

Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC, Transparency Issues.

TEXT BOOKS:

1. W. Richard Stevents, *Unix Network Programming IPC, Vol. II,* 2nd Edition, Pearson Education, Asia.
2. W. Richard Stevents, *Unix Network Programming, Vol. I, Sockets API,* 2nd Edition, Pearson Education, Asia.

REFERENCE BOOKS:

1. T Chan, *Unix Systems Programming Using C++,* 3rd Edition, PHI.
2. Graham Glass, King Ables, *Unix for Programmers and Users,* 3rd Edition, Pearson Education.
3. M.J. Rochkind, *Advanced Unix Programming,* 2nd Edition, Pearson Education.

IV B.Tech. I Semester

10BT71502: SOFT COMPUTING TECHNIQUES

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO AI:
Neural Networks, Fuzzy Logic, Genetic Algorithms. Derivative based optimization: Introduction, Descent Methods, Newton's Methods, Step size determination, Non Linear least squares problems, Derivative free optimization: Introduction, Genetic Algorithms, Simulated Analysis, Randoms search, Down Hill Simplex Search.

UNIT-II: FUNDAMENTALS OF NEURAL NETWORKS
Basic Concepts of Neural Networks, Human Brain, Model of an Artificial Neurons, Neural Network architectures, Characteristics of Neural Network Architecture, Early Neural Network Architecture.

UNIT-III: BACK PROPAGATION NETWORKS
Architecture of a Back Propagation Networks, Back Propagation Learning, Illustration, Applications. Effect of tuning Parameters of Back Propagation Neural Networks, Selection of Various Parameters in BPN, Variations of Standard Back Propagation Algorithm.

UNIT-IV: ASSOCIATIVE MEMORY
Auto Correlators, Hetero Correlators, Multiple Traning Encoding Strategy, Exponential BAM, Associative Memory for Real Coded Pattern pairs, Applications, Adaptive Reasonance Theory, ART1, ART2, Applications.

UNIT-V: FUZZY THEORY
Fuzzy versus Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations.

UNIT-VI: FUZZY SYSTEMS
Crisp Logic, Pridicate Logic, Fuzzy Logic, Fuzzy Rule Based System, Defuzzisication Methods, Applications.

UNIT-VII: FUNDAMENTALS OF GENETIC ALGORITHMS

History, Basic Concepts, Creation of offsprings, Working Principle, Enconding, Fitness Funciton, Reproduction.

UNIT-VIII: GENETIC MODELLING

Inheritance Operators, Cross over, Inversion and Deletion, Mutation, Bitwise Operators, Bitwise Operators used in GA. Genorational Cycle Convergence of Genetic Algorithm, Applications.

TEXT BOOK:

1. S. Rajasekaran and G.A.V. Pai, *Neural Networks Fuzzy Logic and Genetic Algorithms, PHI, 2003.*

REFERENCE BOOKS:

1. E. Gold berg, *Genetic Algorithm: Search, Optimization and Machine Learning,* Addison Wesley N.Y. 1989.

III B.Tech. II Semester

10BT60503: DATA WAREHOUSING AND DATA MINING

L	T	P	C
4	1	-	4

UNIT-I: DATA WAREHOUSE AND OLAP TECHNOLOGY

Data Warehouses – Definitions – Multidimensional Data Model – Data Warehouse Architecture.(Chapter 3;Sections 3.1-3.3 including sub topics of the Text book)

UNIT-II: INTRODUCTION TO DATA MINING

Definition of Data Mining – Kinds of Data – Data Mining Functionalities– Classification of Data Mining Systems – Primitives – Major Issues in Data Mining.

UNIT-III: DATA PREPROCESSING

Descriptive Data Summarization- Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT-IV: MINING FREQUENT PATTERNS AND ASSOCIATIONS

Basic Concepts – Efficient and Scalable Frequent Itemset Mining Methods – Association Rule Mining.(Chapter 5;Sections 5.1-5.5 including subtopics of Text book)

UNIT-V: CLASSIFICATION

Decision Tree Induction, Bayesian Classification – Rule Based Classification, Prediction – Accuracy and Error Measures.

UNIT-VI: CLUSTER ANALYSIS

Cluster Analysis – Categories of Clustering Methods – Partitioning Methods – Hierarchical Methods – Density based Methods – Grid based methods – Model Based Clustering methods – Clustering High Dimensional Data – CLIQUE.

UNIT-VII: MINING STREAM, TIME SERIES AND SEQUENCE DATA

Mining data streams, Mining Time Series Data, Mining Sequence Patterns in Biological Data.

UNIT-VIII: MINING OBJECT, SPATIAL, MULTIMEDIA, TEXT AND WEB

Multi Dimensional Analysis on Complex Object data types – Descriptive Mining on Complex Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Web Mining.

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, *Data Mining: Concepts and Techniques*, 2 ed, Elsevier, 2008.

REFERENCE BOOKS:

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics*, 2 ed, Pearson Education, 2006.
2. Amitesh Sinha, *Data Warehousing*, Thomson Learning, 2007
3. Xingdong Wu, Vipin Kumar, *The Top Ten Algorithms in Data Mining*, Taylor and Francis Group, 2009.
4. Max Barmer, *Principles of Data Mining*, Springer, 2007

IV B.Tech. I Semester

10BT71503: ARTIFICIAL INTELLIGENCE

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

The AI Problems, The Underlying Assumption, The Levels of the Model, Criteria of Success, Some General References, One Final Word and Beyond. Problems, Problem Spaces, and Search: Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs.

UNIT-II: PROBLEM-SOLVING

Uninformed Search Strategies, Avoiding Repeated States. Informed Search and Exploration: Informed (Heuristic) Search Strategies, Heuristic Functions, Local Search Algorithms and Optimization Problems, Local Search in Continuous Spaces, Backtracking Search for CSPs.

UNIT-III: KNOWLEDGE AND REASONING

Logical Agents, Knowledge–Based Agents, The Wumpus World, Logic, Propositional Logic a Very Simple Logic, Reasoning Patterns in Propositional Logic, Effective Propositional Inference, Agents Based on Propositional Logic.

UNIT-IV: FIRST-ORDER LOGIC

Representation Revisited, Syntax and Semantic of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution.

UNIT-V: KNOWLEDGE REPRESENTATION

Ontological Engineering, Categories and Objects, Actions, Situations, and Events, Mental Events and Mental Objects, The Internet Shopping World, Reasoning Systems for Categories, Reasoning with Default Information, Truth Maintenance Systems.

UNIT-VI: UNCERTAIN KNOWLEDGE AND REASONING

Uncertainty, Acting Under Uncertainty, Basic Probability Notation, The Axioms of Probability, Inference Using Full Joint Distributions, Independence, Bayes' Rule and its Use.

UNIT-VII: LEARNING

Learning from Observations, Forms of Learning, Inductive Learning, Learning Decision Trees, Ensemble Learning, Computational Learning Theory, A Logical Formulation of Learning, Knowledge in Learning.

UNIT-VIII: STATISTICAL LEARNING METHODS

Neural Networks. Fuzzy Logic Systems: Introduction, Crisp Sets, Fuzzy Sets, Some Fuzzy Terminology, Fuzzy Logic Control, Sugeno Style of Fuzzy Inference Processing, Fuzzy Hedges, á Cut Threshold.

TEXT BOOKS:

1. Elaine Rich, Kevin Knight and Shivashankar B Nair, *Artificial Intelligence,* 3rd Edition, Tata McGraw Hill.
2. Stuart Russell and Peter Norvig, *Artificial Intelligence A Modern Approach,* 2nd Edition, Pearson Educaiton.

REFERENCE BOOKS:

1. Geroge F. Luther, *Artificial Intelligence: Structures and Strategies for Complex Problem Solving,* 5th Edition, Pearson Education.
2. Eugene Charniak and Drew McDermott, *Introducation to Artificial Intelligence,* Pearson Education.

IV B.Tech. I Semester

10BT71504: NETWORK MANAGEMENT

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT-I: DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW

Analogy of Telephone Network Management, Communication Protocols and Standards, Case Histories on Networking and Management, Network Management Functions, Network and System Management.

UNIT-II: BASIC FOUNDATIONS

Standards, Models, and Language, Network Management Standards, Network Management Models, Organization Model, Information Model, Communication Model, Functional Model, Network Management Applications, Abstract Syntax Notation One: ASN.1, Encoding Structure.

UNIT-III: SNMPV1 NETWORK MANAGEMENT

History of SNMP Management, Internet Organizations and Standards, SNMP Model, Organization and Information Models, Communication and Functional Models.

UNIT-IV: SNMPV2 NETWORK MANAGEMENT

SNMPv2, Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

UNIT-V: SNMPV3 NETWORK MANAGEMENT

SNMPv3, SNMPv3 Key Features, SNMPv3 Documentation Architecture, SNMPv3 Applications, SNMPv3 Management Information Base, SNMPv3 User-based Security Model, Access Control.

UNIT-VI: REMOTE MONITORING

RMON, Remote Monitoring, RMON SMI and MIB, RMON1, RMON2, A Case Study on Internet Traffic Network management tools, systems and engineering.

UNIT-VII: TELECOMMUNICATIONS MANAGEMENT NETWORK

TMN Conceptual model, TMN standards, TMN Architecture, TMN implementation, Network Management Applications.

UNIT-VIII: BROADBAND NETWORK MANAGEMENT

WAN, Wired and optical access Networks, advanced management topics. Distributed Network Management, Reliable and Fault Tolerant Network Management.

TEXT BOOK:

1. Mani Subramanian, *Network Management: Principles and practice,* Pearson Education, 2010.

REFERENCE BOOKS:

1. William Stallings, *SNMP, SNMPv2, SNMPv3, AND RMON 1 and 2*, 3rd Edition, Addison-Wesley, 1999.
2. Morris, *Network management,* Pearson Education, 2006.
3. Mark Burges, *Principles of Network System Administration,* Wiley Dreamtech, 2008.
4. Paul, *Distributed Network Management,* John Wiley, 2000.

IV B.Tech. I Semester

10BT70503: ADVANCED DATA BASES

(ELECTIVE-I)

L	T	P	C
4	-	-	4

UNIT –I: INTRODUCTION

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.

Distributed DBMS Architecture: DBMS Standardization, Architectural Models for Distributed DBMSs, Distributed DMBS Architecture.

UNIT –II: DISTRIBUTED DATABASE DESIGN

Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

Query Processing and Query Decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, Query decomposition, Localization of distributed data.

UNIT –III: OPTIMIZATION OF DISTRIBUTED QUERIES

Query optimization, centralized query optimization, Distributed query optimization algorithms**.**

Introduction to Transaction Management: Definition of a Transaction, Properties of Transactions, Types of Transactions.

UNIT –IV: DISTRIBUTED CONCURRENCY CONTROL

Serializability Theory, Taxonomy of concurrency control Mechanisms, Locking based Concurrency control Algorithms, Time stamp based and Optimistic concurrency control Algorithms, Deadlock Management.

UNIT –V: DATABASE SECURITY

Security Issues, Granting and Revoking Privileges, Multilevel Security, Statistical Database Security, Challenges of Database Security.

UNIT –VI: XML AND INTERNET DATABASES

Structured, Semistructured and Unstructured data, XML Hierarchical Data Model, XML Documents and Databases, XML Schema.

UNIT –VII: GEOGRAPHIC INFORMATION SYSTEMS

Applications, Data Management Requirements, Data Operations, problems and Future Issues.

UNIT –VIII: ADVANCED DATABASES AND APPLICATIONS

Object Databases, Temporal Databases, Multimedia Databases, Spatial Databases, Mobile Databases, Data mining Concepts and Overview of Data warehousing and OLAP.

TEXT BOOK:

1. M. Tamer OZSU and Patrick Valduriez, *Principles of Distributed Database Systems,* Pearson education, 2008.
2. R. Elmasri, S.B.Navathe, S.K.Gupta, D.V.L.N. Somayajulu, *Fundamentals of DB Systmes,* Pearson Education, 2008.

REFERENCE BOOKS

1. Stefano Ceri and Giuseppe Pelagatti, *Distributed Databases: Principles and Systems,* TMH, 1985.
2. Henry F Korth, A Silberchatz and S. Sudarshan, *Database System Concepts,* 5th Edition, MGH, 2006.
3. Raghu Ramakrishna and Johhanes Gehrke, *Database Management Systems,* 3rd Edition, MGH, 2003.

IV B.Tech. I Semester

10BT71222: SOFTWARE ARCHITECUTRE

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO SOFTWARE ARCHITECTURE
Introduction to Software Architecture, Status of Software Architecture, Architecture Business Cycle, Software Architectures Evolution. Software Processes and the Architecture Business Cycle, Features of Good Architecture.

UNIT-II: ARCHITECTURE STYLES
Pipes and Filters, Data Abstraction and Object Oriented organization, Even-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

UNIT-III: SHARED INFORMATION SYSTEMS
Database Integration, Interpretation in Software Development Environments, Architectural Structures for Shared Information Systems.

UNIT-IV: ARCHITECTURAL DESIGN GUIDANCE
Guidance for User Interface Architectures, Case Study in Inter-operability: World Wide Web.

UNIT-V: PATTERN TYPES
Architectural Patterns, Structural Patterns, Patterns for Distribution, Patterns for Interactive Systems

UNIT-VI: FORMAL MODELS AND SPECIFICATIONS
Finalizing the Architecture of a Specific System, Architectural Styles, Architectural Design Space, Case Study: CORBA

UNIT-VII: ARCHITECTURAL DESCRIPTION LANGUAGES (ADL)
Contemporary ADL's today, Capturing Architectural Information in an ADL, Application of ADL's in system Development, Choosing an ADL, Example of ADL.

UNIT-VIII: REUSING ARCHITECTURAL ASSETS WITHIN AN ORGANIZATION
Creating Products and Evaluating a Product Line, Organizational Implications of a Product Line, Component Based Systems. Software Architectures in Figure Legacy Systems, Achieving an Architecutre.

TEXT BOOK:

1. Mary Show, David Garlan, *S/W Arch. Perspective: on an Emerging Discipline*, PHI, 1996.
2. Len Bass, Paul Elements, Rick Kazman, *Software Architecuture in Practice,* PEA, 1998.

REFERENCE BOOKS:

1. Garmus, herros, *Measuring the Software Process: A Practical Guide to Functional Measure,*PHI, 1996.
2. Florac, Carleton, *Meas. Software Process: Stat. Proce. Cont. for Software Process Improvements,* PEA, 1999.
3. W. Humphery, *Introduction to Team Software Process, PEA, 2002.*
4. Peters, *Software Design: Methods and Techniques,* Yourdon, 1981.
5. Buschmann, *Pattern Oriented Software Architecture,* Wiley, 1996.
6. Gamma et al, *Design Patterns,* PEA, 1995.
7. Gamma, Shaw, *An Introduction to Software Architecutre,* World Scientific, 1995.
8. Shaw, Gamma, *Software Architecture,* PHI, 1996.

IV B.Tech. I Semester

10BT71505:**DISTRIBUTED OPERATING SYSTEMS**

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO DISTRIBUTED SYSTEMS

Goals – Advantages of Distributed Systems over Centralized Systems and Independent PCs, Hardware Concepts - switched, Bus-based multiprocessors and multicomputers, Software concepts – Network Operating Systems, Design Issues - Transparency, flexibility, performance.

UNIT-II: COMMUNICATION DISTRIBUTED SYSTEMS

Layered Protocols, Asynchronous Transfer mode Networks, Client server model, Remote procedure call, Group communication.

UNIT-III: SYNCHRONIZATION

Clock synchronization, mutual exclusion – Centralized Algorithm, Distributed Algorithm, Token Ring Algorithm, Election Algorithms, Atomic transactions, Deadlocks in Distributed Systems.

UNIT-IV: **PROCESSES AND PROCESSORS IN DISTRIBUTED SYSTEMS**

Threads, System models, Processor allocation, Scheduling in Distributed Systems, Fault Tolerance, Real-time distributed systems.

UNIT-V: DISTRIBUTED FILE SYSTEMS

File system design – The File Service Interface, The Directory Server Interface, File System Implementation, Trends in distributed file systems.

UNIT-VI: DISTRIBUTED SHARED MEMORY

Introduction - Bus based multi processors, Ring based multiprocessors, Switched multiprocessors, NUMA multiprocessors, Comparison of shared memory systems, Consistency models – Strict Consistency, Casual Consistency, PRAM Consistency.

UNIT-VII: PAGE BASED DISTRIBUTED SHARED MEMORY

Basic Design, Replication, Granularity, Page Replacement, Shared variable distributed shared memory – Munin, Midway, Object based distributed shared memory.

UNIT-VIII:

CASE STUDIES: MACH and CHORUS.

TEXT BOOKS:

1. Andrew S. Tanenbaum, *Distributed Operating Systems*, Prentice Hall International Inc., 2008.

REFERENCE BOOKS:

1. Pradeep K. Sinha, *Distributed Operating Systems Concepts and Design,* Prentice Hall International Inc, 2004.
2. Randy Chow, Theodre Johnson, *Distributed Operating Systems & Algorithm Analysis,* Pearson, 2009.

IV B.Tech. I Semester

10BT71506: MIDDLEWARE TECHNOLOGIES

(ELECTIVE – I)

L	T	P	C
4	-	-	4

UNIT –I: INTRODUCTION TO CLIENT SERVER COMPUTING

Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

UNIT –II: CORBA WITH JAVA

Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web.

UNIT –III: INTRODUCING C# AND THE .NET PLATFORM

Object -Oriented Programming with C#, Callback Interfaces, Delegates and Events, Understanding .NET Assemblies.

UNIT –IV: BUILDING C# APPLICATIONS

Type Reflection, Late Binding and Attribute-Based Programming, Object Serialization and the .NET Remoting Layer, Data Access with ADO.NET, XML Web Services.

UNIT –V: CORE CORBA / JAVA

Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count, multi count.

UNIT –VI: EXISTENTIAL CORBA

CORBA initialization protocol, CORBA activation services, CORBA IDL mapping, CORBA java- to- IDL mapping, The introspective CORBA/ Java object.

UNIT –VII: JAVA BEAN COMPONENT MODEL

Events, properties, persistency, Intrespection of beans, CORBA Beans.

UNIT –VIII: EJBS AND CORBA

Object transaction monitors, CORBA OTM's, EJB and CORBA OTM's, EJB container framework, Session and Entity Beans, The EJB client/ server development Process, the EJB container protocol, support for transaction, EJB packaging, EJB design Guidelines**.**

TEXT BOOK:

1. Robert Orfali and Dan Harkey, *Client/Server Programming with Java and CORBA,* 2nd Edition, John Wiley and Sons, 2008.
2. Andrew Troelsen, *C# and the .NET Platform,* 2nd Edition, Apress Wiley-dreamtech, 2003.

REFERENCE BOOKS:

1. D T Dewire, *Client/Server Computing*, 2nd Edition, Tata Mc GrawHill Publications, 2008.
2. Robert Orfali Dan Harkey and Jeri Edwards, *Client/Server Survival Guide*, 3rd Edition, John Wiley and Sons, 2008.

IV B.Tech. I Semester

10BT71507: PATTERN RECOGNITION

(ELECTIVE – II)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Machine perception, pattern recognition example, pattern recognition systems, the design cycle, learning and adaptation.

UNIT-II: BAYESIAN DECISION THEORY

Introduction, continuous features – two categories classifications, minimum error-rate classification- zero–one loss function, classifiers, discriminant functions, and decision surfaces.

UNIT-III: NORMAL DENSITY

Univariate and multivariate density, discriminant functions for the normal density-different cases, Bayes decision theory – discrete features, compound Bayesian decision theory and context.

UNIT-IV: MAXIMUM LIKELIHOOD AND BAYESIAN PARAMETER ESTIMATION

Introduction, maximum likelihood estimation, Bayesian estimation, Bayesian parameter estimation–Gaussian case.

UNIT-V: UN-SUPERVISED LEARNING AND CLUSTERING

Introduction, mixture densities and identifiability, maximum likelihood estimates, application to normal mixtures, Kmeans clustering. Date description and clustering – similarity measures, criteria function for clustering.

UNIT-VI: COMPONENT ANALYSES

Principal component analysis, non-linear component analysis; Low dimensional representations and multi dimensional scaling.

UNIT-VII: DISCRETE HIDDEN MORKOV MODELS

Introduction, Discrete–time markov process, extensions to hidden Markov models, three basic problems for HMMs.

UNIT-VIII: CONTINUOUS HIDDEN MARKOV MODELS

Observation densities, training and testing with continuous HMMs, types of HMMs.

TEXT BOOK:

1. Richard O. Duda, Peter E. Hart, David G. Sroke, *Pattern Classifications,* 2nd Edition, Wiley Student Edition.
2. Lawerence Rabiner, Biling - Hwang Juang, *Fundamentals of Speech Recognition,* Pearson Education.

REFERENCE BOOKS:

1. Earl Gose, Richard John baugh, Steve Jost, *Pattern Recognition and Image Analysis,* PHI, 2004.

IV B.Tech. I Semester

10BT71508: EMBEDDED COMPUTING SYSTEMS

(ELECTIVE - II)

L	T	P	C
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UNIT – I: INTRODUCTION TO EMBEDDED SYSTEMS

Embedded Systems, Processor Embedded into a system, Embedded Hardware units and devices in a system, Embedded software in a system, examples of embedded systems, embedded system-on-chip(soc) and use VLSI circuit design technology, Complex Systems Design and processors, design process and design Examples, classification of embedded systems, skills required for an embedded system designer.

UNIT – II: 8051 AND ADVANCED PROCESSOR ARCHITECTURES

8051 architecture, real world interfacing, introduction to advanced architectures, processor and memory organization, instruction level parallelism, performance metrics, memory types, memory-maps and addresses, processor selection, memory selection, I/O types and examples, serial communication devices, parallel device ports, wireless devices, timer and counting devices, Networked Embedded systems, internet enabled systems, wireless and mobile system protocols.

UNIT – III: DEVICE DRIVERS AND INTERRUPT SERVICE MECHANISM

Programmed- I/O Busy wait approach without interrupt service mechanism, ISR Concept, Interrupt sources, Interrupt servicing Mechanism, Multiple Interrupts, context and the periods for context switching, Interrupt latency and deadline, classification of processors interrupt service mechanism from context saving angle, Direct Memory Access, device driver programming.

UNIT – IV: PROGRAMMING CONCEPTS AND PROGRAM MODELING CONCEPTS

Software programming in ALP and high level language 'C', C program elements: header and source files and preprocessor directives, macros and functions, data types, data structures, modifiers, statements, loops and pointers. Program models, DFG Models, State machine programming models for event-controlled program flow, modeling of multi processor systems, UML Modelling.

UNIT – V: INTER PROCESS COMMUNICATION

Multiple Processes in an application, Multiple Threads in an application, tasks, Task states, Task and data, clear cut distinction between functions, ISRS and tasks, concept of semaphores, Shared data, Inter Process Communication, Signal Function, Semaphore Functions, Message queue functions, Mail Box Functions, Pipe functions, Socket Functions, RPC functions.

UNIT – VI: REAL TIME OPERATING SYSTEMS

OS services, process management, Timer functions, Event Functions, memory management, Device, file and I/O Subsystems Management, Interrupt routines in RTOS Environment and handling of interrupt source calls, Basic design using RTOS, RTOS scheduling models, interrupt latency and response of the tasks as performance metrics, OS security issues RTOS Programming: Micro/OS-II, VxWorks, Windows CE,OSEK and RTLinux.

UNIT – VII: DESIGN EXAMPLES AND CASE STUDIES OF PROGRAM MODELING AND PROGRAMMING WITH RTOS

Case studies: Automatic chocolate vending machine, Communication between orchestra robots, Embedded system for smart card, Mobile phone software for key Inputs.

UNIT– VIII: EMBEDDED SOFTWARE DEVELOPMENT, TESTING, SIMULATION AND DEBUGGING

Host and target machines, linking and locating software, getting embedded software into Target system, testing on host machines and simulators

TEXT BOOKS :

1. Raj Kamal, *Embedded Systems Architecture, Programming and Design,* 2nd Edition, McGraw-Hill Companies.

REFERENCE BOOKS:

1. Frank Vahid, Tony D. Givargis, *Embedded System Design - A Unified Hardware/Software Introduction,* John Wiley, 2002.
2. KVKK Prasad, *Embedded / Real Time Systems,* Dream Tech Press, 2005.
3. David E. Simon, *An Embedded Software Primer*, Pearson Education, 2005.
4. Michael J Pont, *Embedded C,* Pearson Education 2007.

IV B.Tech. I Semester

10BT71208: SOFTWARE PROJECT MANAGEMENT

(ELECTIVE-II)

L	T	P	C
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UNIT – I: SOFTWARE EFFORTS ESTIMATION TECHNIQUES

The waterfall Model, conventional software Management Performance.

Evolution of software economics**:** Software Economics, pragmatic software cost estimation.

UNIT – II: IMPROVING SOFTWARE ECONOMICS

Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections, The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT – III: LIFE CYCLE PHASES

Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process**:** The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT – IV: MODEL BASED SOFTWARE ARCHITECTURES

A Management perspective and technical perspective. Workflows of the process**:** Software process workflows, Iteration workflows.

UNIT – V: CHECKPOINTS OF THE PROCESS

Major mile stones, Minor Milestones, Periodic status assessments. Iterative process planning**:** Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT – VI: PROJECT ORGANIZATIONS AND RESPONSIBILITIES

Line-of-Business Organizations, Project Organizations, evaluation of organizations.

Process automation**:** Automation Building blocks, The Project Environment.

UNIT – VII: PROJECT CONTROL AND PROCESS INSTRUMENTATION

The seven cor Metrics, Management indicators, quality indicators, life cycle expectaion, pragmatic software Metrics, Metrics automation.

Tailoring the process**:** Process discriminants.

UNIT – VIII: NEXT GENERATION SOFTWARE ECONOMICS

Modern Project Profiles, Next generation Software economics, modren process trasitions.

Case studies**:** The command Center Processing and Display system- Replacement (CCPDS-R), Process Improvement and Mapping to the CMM.

TEXT BOOKS:

1. Walker Toyce, *Software Project Management*, Pearson Education, 2005.

REFERENCE BOOKS:

1. Bob Hughes and Mike Cotterell, *Software Project Management,* Tata McGraw-Hill Edition, 2006.
2. Joel Henry, *Software Project Management,* Pearson Education, 2003.

IV B.Tech. I Semester

10BT71204: CRYPTOGRAPHY AND NETWORK SECURITY

(ELECTIVE – II)

L	T	P	C
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UNIT - I: INTRODUCTION

Security Attacks - Interruption, Interception, Modification and Fabrication. Security Services - Confidentiality, Authentication, Integrity, Non-repudiation, Access control and Availability. Security Mechanisms - A model for Internetwork security, Internet Standards and RFCs, Conventional Encryption Principles, Ceaser Cipher, Hill cipher, Poly and Mono Alphabetic Cipher.

UNIT - II: ENCRYPTION PRINCIPLES

Conventional encryption algorithms: Feistal structure, DES algorithm, S-Boxes, Triple DES, Advanced Data Encryption Standard (AES),Cipher block modes of operation, location of encryption devices, Key Distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT - III: CRYPTOGRAPHY AND APPLICATIONS

Public key cryptography principles, public key cryptography algorithms, Digital signatures, RSA, Elliptic Algorithms, Digital Certificates, Certificate Authority and key management, Kerberos, X.509, Directory Authentication Service.

UNIT - IV: ELECTRONIC MAIL SECURITY

Email privacy: PGP operations, Radix-64 Conversion, Key Management for PGP, PGP Trust Model, Multipurpose Internet Mail Extension (MIME), Secure/MIME(S/MIME).

UNIT - V: IP SECURITY ARCHITECTURE AND SERVICES

IP Security Overview, IP Security Architecture, Security Association, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management: OAKELY key determination protocol, ISAKMP.

UNIT – VI: WEB SECURITY

Web Security Considerations, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - VII: NETWORK MANAGEMENT SECURITY

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.

System Security: Intruders-Intrusion techniques, Intrusion Detection, Password Management, Bot nets.

Malicious Software: Viruses and related threats, Virus Counter Measures, Distributed Denial of Service Attacks.

UNIT - VIII: FIREWALLS

Firewall Design principles, Trusted Systems, Common Criteria for Information Technology Security Evolution.

TEXT BOOKS:

1. William Stallings, *Network Security Essentials (Applications and Standards)*, 3ed, Pearson Education.
2. Stallings, *Cryptography and Network Security,* 3ed, PHI/ Pearson.

REFERENCE BOOKS:

1. Eric Maiwald, *Fundamentals of Network Security,* (Dreamtech Press), 2004.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a public World,* 2ed, Pearson/ PHI.
3. Rober Bragg, Mark Rhodes, *Network Security: The Complete reference,* TMH, 2004.
4. Buchmann, *Introduction to Cryptography,* 2ed, Springer, 2004.

IV B.Tech. I Semester

10BT71509: ADVANCED COMPUTER ARCHITECUTRE

(ELECTIVE – II)

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UNIT – I: PARALLEL COMPUTER MODELS

The State of Computing-Multiprocessors and MultiComputers- Multivector and SIMD Computers, PRAM and VLSI Models, Architectural Development Tracks, Program and Network Properties: Conditions of Parallelism, Program Partitioning and Scheduling, Program Flow Mechanisms, System Interconnect Architectures.

UNIT – II: PRINCIPLES OF SCALABLE PERFORMANCE

Performance Metrics and Measures, Parallel Processing Applications, Speedup Performance Laws, Scalability Analysis and Approaches. Processors and Memory Hierarchy: Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology.

UNIT III: BUS, CACHE AND SHARED MEMORY

Bus Systems, Cache Memory Organizations, Shared-Memory Organizations, Pipelining and Super Scalar Techniques: Linear Pipeline Processors, Nonlinear Pipeline Processors, Instruction Pipeline Design, Arithmetic Pipeline Design.

UNIT IV: MULTIPROCESSORS AND MULTICOMPUTER

Multiprocessor System Interconnects Cache Coherence and Synchronization Mechanisms, Three Generations of Multicomputers, Message-Passing Mechanisms.

UNIT V: MULTIVECTOR AND SIMD COMPUTERS

Vector Processing Principles, Multivector, MultiProcessors, Compound Vector Processing, SIMD Computer Organizations, The Connection Machine CM-5.

UNIT VI: SCALABLE, MULTITHREADED AND DATAFLOW ARCHITECTURES

Latency, Hiding Techniques, Principles of Multithreading, Fine-Grain Multicomputers, Scalable and Multithreaded Architectures, Dataflow and Hybrid Architectures.

UNIT VII: INSTRUCTION LEVEL PARALLELISM

Introduction, Basic Design Issues, Problem Definition, Model of a Typical Processor, Operand Forwarding, Reorder Buffer, Register Renaming-Tomasulo's Algorithm, Branch Prediction, Limitations in Exploiting Instruction Level Parallelism, Thread Level Parallelism.

UNIT VIII: TRENDS IN PARALLEL SYSTEMS

Brief Overview of Technology, Forms of Parallelism, Case Studies.

TEXT BOOKS:

1. Kai Hwang and Jotwani, *Advanced Computer Architecture,* 2nd Edition, McGraw-Hill Publications.

REFERENCE BOOKS:

1. D.Sima, T.Fountain, P.Kacsuk, *Advanced Computer Architecture,* Pearson Education.
2. John L.Hennessy and David A. Patterson, *Computer Architecture: A Quantitative Approach,* 3rd Edition, Morgan Kufmann (An Imprint of Elsevier).
3. Hwang and Briggs, *Computer Architecture and Parallel Processing.*

IV B.Tech. I Semester

10BT71511: DATA WAREHOUSING AND DATA MINING LAB

L	T	P	C
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List of Practicals:

1. Gain insight for running pre-defined decision trees and explore results using MS OLAP Analysis.

2. Using IBM OLAP Miner - Understand the use of data mining for evauating the content of multidimensional cubes.

3. Using Teradata Warehouse Miner - Create mining models that are executed in SQL. (BI Portal Lab: The objective of the lab exercises is to integrate pre-built reports into a protal application).

4. Publish cognos cubes to a business intelligence protal. Metadata & ETL Lab: The objective of the lab exercises is to implement metadata improt agents to pull metadata from leading business intelligence tools and populate a metadata repository. To understand ETL processes.

5. Improt metadata from specific business intelligence tools and populate a mata data repository.

6. Publish metadata stored in the repository.

7. Load data from heterogenous sources including text files into a pre-defined warehouse schema.

CASE STUDIES:

8. Design a data mart from scratch to store the credit history of customers of a bank. use this credit profiling to process future loan applications.

9. Design and build a Data Warehouse using bottom up approach titled 'Citizen Information System'. This should be able to serve the analytical needs of the various government departments and also provide a global integrated view.

IV B.Tech. I Semester

10BT71511: NETWORK PROGRAMMING LAB

L	T	P	C
-	-	3	2

List of Practicals:

1. Implement the following
a) Pipes b) FIFO

2. Implement file transfer using Message Queue form of IPC.

3. Implement file transfer using Shared Memory.

4. Design TCP iterative Client and Server Application to print current Date and Time.

5. Design TCP iterative Client and Server Application to reverse the given input sentence.

6. Design TCP Client and Server Application to transfer file.

7. Design TCP concurrent server to echo given set of sentences using poll functions.

8. Design UDP Client and server application to implement the echo concept.

9. Design TCP Concurrent server to handle multiple file descriptors using System Call Select.

10. Design UDP Client and server application to reverse the given imput sentence

11. Design UDP Client server to transfer a file

12. Design using poll Client server application to multiplex TCP and UDP requests for converting a given text into upper case.

13. a) Write an RPC Application to Square a number.
b) Design a RPC Application to add and subtract a given pair of integers.

IV B.Tech. I Semester

10BT7HS01: **PROFESSIONAL ETHICS**

(AUDIT COURSE)

L	T	P	C
-	2	-	-

UNIT-I: ENGINEERING ETHICS

Scope and aims of engineering ethics-Senses of Engineering Ethics-Variety of Moral Issues-Types of Inquiry- Moral Dilemmas,- Moral Autonomy- Kohlberg's Theory, Gilligan's theory, Consensus and Controversy.

UNIT-II: PROFESSIONAL IDEALS AND VIRTUES

Theories about virtues, professional responsibility, integrity, self-respect, sense of "responsibility". Self-Interest, Customs and Religion- Self-interest and ethical egoism, customs and ethical relativism, religion and divine command ethics. Use of ethical theories- resolving moral dilemmas and Moral leadership

UNIT-III: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation- similarities to standard experiments, learning from the past and knowledge gained. Engineering as Responsible experiments-Conscientiousness. Moral autonomy and accountability, the challenger case.

UNIT-IV: RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty, Respect for authority, collective bargaining, confidentiality, conflict of interests, occupational crime. Rights of Engineers- Professional rights, whistle-blowing, The bart case, employee rights and discrimination.

UNIT-V: GLOBAL ISSUES

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Managers, Consultants and Leaders. Engineers as managers – Managerial ethics applied to engineering profession.

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, *Ethics in Engineering*, Tata McGraw-Hill, 3 ed, 2007.
2. Govindarajan M, Nata Govindarajan. M, Natarajan. S, Senthilkumar. V.S, *Engineering Ethics*, Prentice Hall of India, 2004.

REFERENCE BOOKS:

1. Dr. S. Kannan, K. Srilakshmi, *Human Values and Professional Ethics*, Taxmann Allied Services Pvt Ltd., 2009.
2. Edmund G seebauer and Robert L Barry, *Fundamental of Ethics for scientists and Engineers*, Oxford University Press, Oxford, 2001.
3. Charles F Fledderman, *Engineering Ethics*, Pearson education/ Prentice Hall, NewJercy, 2004 (Indian Reprint).

IV B.Tech. II Semester

10BT6HS01: MANAGEMENT SCIENCE

L	T	P	C
4	-	-	4

UNIT - I: INTRODUCTION TO MANAGEMENT

Concepts of management and organization - Nature and Importance of management - Evolution of management thought - Functions of management - Contributions of F.W. Taylor and Henri Fayol to the management - Systems approach to management - Managerial skills- Elements of corporate planning process - Environmental scanning - SWOT Analysis - Social responsibilities of management.

UNIT - II: DESIGNING ORGANIZATIONAL STRUCTURES

Basic concepts related to organization – Departmentation and decentralization - Types of organizations – Merits, demerits and adoptability to modern firms.

UNIT - III: OPERATIONS MANAGEMENT

Principles and types of plant layout - Methods of production - Forecasting - Forecasting methods - Work study - Basic procedure involved in method study and work measurement - Statistical quality control: Factors affecting quality - Quality control using control charts (simple problems) - Acceptance sampling.

UNIT - IV: MATERIALS MANAGEMENT

Materials management objectives – Inventory - Types of inventory– Safety stock - Classical EOQ model - Need for inventory control – EOQ simple problems - ABC analysis - Purchase procedure - Stores management.

Marketing: Functions of marketing - Marketing mix - Channels of distribution.

UNIT - V: HUMAN RESOURCES MANAGEMENT (HRM)

Nature and scope of HRM - HRD and personnel management and industrial relations - Functions of HRM - Role of HR Manager in an organization - Performance appraisal - Job evaluation and merit rating - Motivation - Importance of motivation - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

UNIT - VI: PROJECT MANAGEMENT (PERT/CPM)

Network analysis - Program evaluation and review technique (PERT)- Critical path method (CPM) - Identifying critical path - Probability of completing the project within given time - Project cost analysis - Project crashing (simple problems).

UNIT - VII: ENTREPRENEURSHIP

Introduction to entrepreneurship - Definition of an entrepreneur - Entrepreneurial traits - Entrepreneur vs. Manager - Entrepreneurial decision process - Role of entrepreneurship in economic development-Social responsibilities of entrepreneurs - Opportunities for entrepreneurs in India and abroad - Women as an entrepreneur.

UNIT - VIII: CONTEMPORARY MANAGEMENT PRACTICES

Basic concepts of Just-In-Time (JIT) system - Total quality management (TQM) - Value chain analysis - Enterprise resource planning (ERP) - Business process outsourcing (BPO) – Globalization-Management challenges - Intellectual property rights - Supply chain management - Role of information technology in managerial decision making.

TEXT BOOKS:

1. O.P. Khanna, *Industrial Engineering and Management,* Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management,* 6 ed, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement,* 12 ed, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6 ed, TMH, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2 ed, TMH, New Delhi.
4. Heinz Weihrich and Harold Koontz*, Management- A Global Perspective,*10 ed, McGraw-Hill International.

IV B.Tech. II Semester

10BT70402: DIGITAL IMAGE PROCESSING

(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT –I: DIGITAL IMAGE FUNDAMENTALS

Introduction, Image sensing and acquisition, Image sampling and quantization, some basic relationships between pixels. Mathematical tools used in digital image processing - array Vs matrix operations, linear Vs non linear operations, Arithmetic operations, Set and Logical operations, Spatial operations, vector and matrix operations, Probabilistic methods.

UNIT –II: IMAGE TRANSFORMS

2D-DFT and properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar-Transform, Slant Transform, Hotelling Transform.

UNIT –III: IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN

Basic Intensity transformations functions, Histogram processing, Fundamentals of Spatial Filtering, Smoothing spatial filters, Sharpening spatial filters, Combining spatial Enhancement methods.

UNIT –IV: IMAGE ENHANCEMENT IN FREQUENCY DOMAIN

Basics of filtering in frequency domain, Correspondence between filtering in the spatial and frequency domains, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters, Homomorphic filtering.

UNIT –V: IMAGE RESTORATION

Noise models, Restoration in the presence of Noise only-spatial filtering - mean, order- statistic and adaptive filters, Estimating the degradation function, Inverse filtering, Weiner filtering, Constrained least squares filtering.

UNIT –VI: IMAGE SEGMENTATION

Point, line and edge Detection, Thresholding, Region based Segmentation, The use of motion in Segmentation.

UNIT –VII: IMAGE COMPRESSION

Need for Image Compression, Classification of redundancy in Images, Image Compression models, Classification of image compression schemes, Run length coding, Arithmetic coding, Block truncation coding, Dictionary based compression, Transform based compression, Image compression standards.

UNIT –VIII: COLOR IMAGE PROCESSING

Color models, Pseudo color image processing, Color transformations, Smoothing and Sharpening, Image segmentation based on color.

TEXT BOOKS:

1. R.C. Gonzalez and R.E. Woods, *Digital Image Processing,* 2nd Edition, Addison Wesley, Pearson Education, 2002.
2. Malay K. Pakhira, *Digital Image Processing and Pattern Recognition,* PHI, 2011.

REFERENCE BOOKS:

1. Rafael C. Gonalez, Richard E woods and Steven L.Eddins, *Digital Image Processing using MATLAB,* Tata McGraw Hill, 2010.
2. S. Jayaraman, S Esakkirajan, T Veerakumar, *Digital Image Processing,* Tata McGraw Hill.
3. A.K. Jain, *Fundamentals of Digital Image Processing,* PHI.

IV B.Tech. II Semester

10BT60405: VLSI DESIGN

(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT-II: BASIC ELECTRICAL PROPERTIES

Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit ; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT-III: VLSI CIRCUIT DESIGN PROCESSES

VLSI design flow, MOS layers, Stick diagrams, Design rules and Lay out, 2 m CMOS design rules for Wires, Contacts and Transistors, Layout diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

UNIT-IV: GATE LEVEL DESIGN

Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations - Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT-V: SUBSYSTEM DESIGN

Adders – Transmission based Adder, Carry Bypass Adder, Carry Skip Adder, Carry Select Adder, Shifters- Barrel Shifter, Logarithmic Shifter, Multipliers – Definitions, Array Multiplier, Carry Save multiplier, Booth Multiplier, ALUs, Parity generators, Comparators, Zero/One Detectors, Counters- Synchronous & Asynchronous Counter, High Density Memory Elements.

UNIT-VI: SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN

PLAs, FPGAs, CPLDs, PALs, Cell based Design Methodology, Design Approach.

UNIT-VII: VHDL SYNTHESIS

VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Types of Simulation, Layout Synthesis, Design capture tools, Design Verification Tools.

UNIT-VIII: CMOS TESTING

CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXT BOOKS:

1. Kamran Eshaghian, Eshraghian Douglas and A. Pucknell, *Essentials of VLSI Circuits and Systems,* PHI, 2005 Edition.
2. Weste and WShraghian, *Principles of CMOS VLSI Design,* Pearson Education, 1999.

REFERENCE BOOKS:

1. A Design Perspective, John M. Rabaey, *Digital Integrated Circuits,* 2nd Edition, PHI, EEE, 1997.
2. Wayne wolf, *Modern VLSI Design,* 3rd Edition, Pearson Education, 1997.
3. Charles H.Roth, *Fundamentals of Logic Design,* 5th Edition, Thomson Publications, 2004.

IV B.Tech. II Semester

10BT81501: SOFTWARE TESTING TECHNIQUES

(ELECTIVE – III)

L	T	P	C
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UNIT–I: INTRODUCTION AND THE TAXONOMY OF BUGS

Purpose of Testing, Some Dichotomies, A Model for Testing, The Consequences of Bugs, A Taxonomy for Bugs, Some Bug Statistics.

UNIT –II: FLOW GRAPHS AND PATH TESTING

Path-Testing Basics, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Implement and Application of Path Testing.

UNIT–III: TRANSACTION-FLOW TESTING AND DATA-FLOW TESTING

Transaction Flows, Transaction-Flow Testing Techniques, Dataflow Testing Basics, Data-Flow Testing Strategies, Applications, Tools, Effectiveness.

UNIT–IV: DOMAIN TESTING

Domains and Paths, Nice & Ugly Domains, Domain Testing, Domains and Interfaces Testing, Domains and Testability.

UNIT–V: PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS

Path Products and Path Expressions, A Reduction Procedure, Applications, Regular Expressions and Flow-Anomaly Detection.

UNIT–VI: LOGIC BASED TESTING

Motivational Overview, Decision Tables, Path Expressions Again, KV Charts, Specifications.

UNIT–VII: STATES, STATE GRAPHS AND TRANSITION TESTING

State Graphs, Good State Graphs and Bad, State Testing, Testability Tips.

Graph Matrices and Applications: Motivational overview, The Matrix of a Graph, Relations, The Powers of a Matrix, Node-Reduction Algorithm, Building Tools.

UNIT–VIII: AN OVERVIEW OF SOFTWARE TESTING TOOLS

Overview of WinRunner and QTP Testing Tools for Functional/ Regression Testing, Testing an Application Using WinRunner and QTP, Synchronization of Test Cases, Data-Driven Testing, Testing a Web Application.

TEXT BOOKS:

1. Boris Beizer, *Software Testing Techniques,* 2nd Edition, Dreamtech Press, 2004.
2. Dr. K.V.K.K. Prasad, *Software Testing Tools,* Dreamtech Press, 2008.

REFERENCE BOOKS:

1. William E.Perry, *Effective Methods of Software Testing,* 3rd Edition, John Wiley, 2007.
2. Glenford J.Myers, *The Art of Software Testing,* 2nd Edition, Wiley-India, 2006.

IV B.Tech. II Semester

10BT81221: ADHOC WIRELESS NETWORKS

(ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Fundamentals of wireless communication technology, The electromagnetic spectrum, Radio propagation mechanisms, Characteristics of wireless channels, Modulation techniques, Multiple access techniques, Voice coding, Error control, IEEE 802 networking standard.

UNIT-II: ISSUES IN ADHOC WIRELESS NETWORKS

Introduction, Issues in Adhoc wireless Networks, MAC layer issues, Network layer issues, Multicasting issues,Transport layer issues and other issues, Adhoc wireless Internet.

UNIT-III: DESIGN GOALS OF MAC PROTOCOLS

Issues in designing a MAC Protocol, Classification of MAC protocol, Contention Based protocols: MACAW, BTMA, MARCH, Contention based protocols with reservation: CATA, SRMA/PR and contention based MAC protocols with scheduling mechanisms: DLBPS, Other protocols: Directional MAC Protocols, multichannel Protocol.

UNIT-IV: ROUTING PROTOCOLS FOR ADHOC WIRELESS NETWORKS:

Introduction, Issues in Designing a Routing Protocol for Adhoc Wireless Network, Classification of Routing protocols, Table-Driven Routing protocols: DSDV, CGSR, On-Demand Routing Protocols: DSR, AODV, TORA, Hybrid Routing protocols: CEDAR, ZR.

UNIT-V: MULTICAST ROUTING IN ADHOC WIRELESS NETWORKS

Introduction, Issues in Designing a Multicast Routing protocol, Operation of Multicast Routing protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing protocols, Tree - Based Multicast Routing protocols: BEMRP, MZRP, MCEDAR, MAODV, ASTMRP, Mesh-Based Multicast Routing Protocols: ODMRP, DCMP, NSMP.

UNIT-VI: TRANSPORT LAYER AND SECURITY PROTOCOLS FOR ADHOC WIRELESS NETWORKS

Introduction, Issues in Designing a Transport Layer Protocol for Adhoc wireless networks, Design Goals of a Transport Layer Protocol for Adhoc wireless Networks, Classification of Transport Layer Solutions, TCP over Adhoc wireless networks, Other Transport Layer Protocols for Adhoc wireless Networks.

UNIT-VII: QUALITY OF SERVICE(QOS)

Introduction, Issues and Challenges in providing QOS in Adhoc wireless networks, Classification of QOS Solutions, Mac Layer Solutions, Network Layer Solutions, QOS Frame work for Ad hoc wireless networks.

UNIT-VIII: SECURITY IN ADHOC WIRELESS NETWORKS

Network Security Requirements, Issues and challenges in Security Provisioning, Network Security Attacks, Key management, Secure Routing in Adhoc wireless Networks.

TEXT BOOK:

1. C. Siva Ram Murthy, B.S. Manoj, *Adhoc Wireless Networks-Architectures and Protocols*, Pearson Education, Delhi, 2005

REFERENCE BOOKS:

1. C.K. Toh, *Adhoc Mobile Wireless Networks Protocols and Systems*, Pearson Education, 2007
2. William Stalling, *Wireless Communications and Networks*, 2 ed, Pearson Education, India.
3. Jochen Schiller, *Mobile Communications*, 2 ed, Pearson Education.
4. Ivan Stojmenovic, *Handbook of Wireless Networks and Mobile Computing*, John Wiley & Sons Inc, Canada, 2002.

IV B.Tech. II Semester

10BT81207: WIRELESS NETWORKS

(ELECTIVE-III)

L	T	P	C
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UNIT-I: OVERVIEW OF WIRELESS NETWORKS

Introduction: Information Network infrastructure, Overview of existing network infrastructure, Applications, Evaluation of voice-oriented wireless Networks, Evaluation of Data-oriented wireless Networks, different generations of Wireless networks: 1G, 2G, 3G and beyond.

UNIT-II: CHARACTERISTICS OF THE WIRELESS MEDIUM

Introduction, radio propagation mechanisms, path-loss modeling and signal coverage, effects of multi path and Doppler, channel measurement and modeling techniques.

UNIT-III: PHYSICAL LAYER ALTERNATIVES FOR WIRELESS NETWORKS

Introduction, applied wireless transmission techniques, short distance base band transmission, UWB pulse transmission, Carrier Modulated transmission, Broadband modems for higher speeds, Spread Spectrum transmissions, High-speed Modems for Spread spectrum technology, Diversity and Smart Receiving Techniques, Comparison of modulation schemes, Coding techniques for wireless communications.

UNIT-IV: WIRELESS MEDIUM ACCESS ALTERNATIVES

Introduction, fixed-assignment access for Voice-Oriented networks, Random access for Data-Oriented Networks, Integration of Voice and Data Traffic: Data Integration in voice- Oriented Networks and Voice Integration into Data- Oriented Networks.

UNIT-V: NETWORK PLANNING

Introduction, wireless network topologies, Cellular Topology, Cell Fundamentals, Signal-to-interference ratio calculation, capacity Expansion Techniques, network planning for CDMA systems.

UNIT-VI: WIRELESS NETWORK OPERATION

Introduction, mobility management, radio resources and power management, security in wireless networks.

UNIT-VII: WIRELESS WANs

GSM, Mechanisms to support a Mobile Environment, communications in the infrastructure, CDMA: The IS-95 CDMA Forward Channel, The IS-95 CDMA Reverse Channel, Mobility and Radio Resource Management in IS-95.

UNIT-VIII: WIRELESS LANs

Evaluation of the WLAN industry, Wireless Home networking, IEEE 802.11, Bluetooth, interface between Bluetooth and 802.11, Zigbee wireless communications protocol.

Wireless Geolocation Systems: Wireless Geolocation System Architecture, Technologies for wireless Geolocation.

TEXT BOOK:

1. Kaveh Pahlavan and Prashant Krishnamurthy, *Principles of Wireless Networks-a unified approach,* Prentice-Hall of India Pvt Ltd, 2006.

REFERENCE BOOKS:

1. William Stallings, *Wireless Communications and Netowrks,* Pearson Education, 2005.
2. Theodore S. Rappaport, *Wirless Communications - Principles and practice,* 2nd Edition, PHI, 2002.
3. Jim Geier, *Wireless Netowrks first-step,* Pearson Education, 2005.
4. Sumit Kaseraetal, *2.5G Mobile Networks: GPRS and EDGE,* Tata McGraw Hill, 2008.

IV B.Tech. II Semester

10BT81502: EMBEDDED PROCESSORS

(ELECTIVE – IV)

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION TO EMBEDDED SYSTEMS

Embedded Systems, Processor Embedded into a system, Embedded Hardware units and devices in a system, Embedded software in a system, examples of embedded systems, embedded system-on-chip(soc) and use VLSI circuit design technology, Complex Systems Design and processors, design process and design Examples, classification of embedded systems, skills required for an embedded system designer.

UNIT – II: 8051 AND ADVANCED PROCESSOR ARCHITECTURES

8051 architecture, real world interfacing, introduction to advanced architectures, processor and memory organization, instruction level parallelism, performance metrics, memory types, memory-maps and addresses, processor selection, memory selection, I/O types and examples, serial communication devices, parallel device ports, wireless devices, timer and counting devices, Networked Embedded systems, internet enabled systems, wireless and mobile system protocols.

UNIT – III: INTRODUCTION TO ARM

The RISC Design Philosophy, The ARM Design Philosophy, Embedded System Hardware, Embedded System Software, Registers, Current Program Status Register, Pipeline, Exceptions, Interrupts, and the Vector Table, Core Extensions, Architecture Revisions, ARM Processor Families

UNIT – IV: THE ARM INSTRUCTION SET

Data Processing Instructions, Branch Instructions, Load-Store Instructions, Software Interrupt Instruction, Program Status Register Instructions, Loading Constants, ARMv5E Extensions, Conditional Execution, Introduction to thumb Instruction set.

UNIT – V: WRITING AND OPTIMIZING ARM ASSEMBLY CODE

Writing Assembly Code, Profiling and Cycle , Counting, Instruction Scheduling, Register Allocation, Conditional Execution,Looping Constructs, Bit Manipulation, Efficient Switches, Handling Unaligned Data, Optimized Primitives.

UNIT – VI: EMBEDDED OPERATING SYSTEMS

Fundamental Components**,** Example: Simple Little Operating System, The Memory Hierarchy and Cache Memory, Cache Architecture, Cache Policy, Coprocessor 15 and Caches, Flushing and Cleaning Cache Memory, Cache Lockdown, Caches and Software Performance.

UNIT – VII: REAL TIME OPERATING SYSTEMS

OS services, process management, Timer functions, Event Functions, memory management, Device, file and I/O Subsystems Management, Interrupt routines in RTOS Environment and handling of interrupt source calls, Basic design using RTOS, RTOS scheduling models, interrupt latency and response of the tasks as performance metrics, OS security issues RTOS Programming: Micro/OS-II, VxWorks, Windows CE,OSEK and RTLinux.

UNIT – VIII: DESIGN EXAMPLES AND CASE STUDIES OF PROGRAM MODELING AND PROGRAMMING WITH RTOS

Case studies: Automatic chocolate vending machine, Communication between orchestra robots, Embedded system for smart card, Mobile phone software for key Inputs.

TEXT BOOKS:

1. Raj Kamal, *Embedded Systems Architecture, Programming and Design,* 2nd Edition, McGraw-Hill.
2. Andrew N Sloss, Dominic Symes, *ARM System Developers guide: designing and optimizing system software,* Chris wright - Elsevier 2004.

REFERENCE BOOKS:

1. KVKK Prasad, *Embedded /Real Time Systems,* Dreamtech Press, 2005.
2. David E. Simon, *An Embedded Software Primer,* Pearson Education, 2005.
3. Steve Furber, *ARM System on chip Architecture,* 2nd Edition, Pearson Education.
4. David Seal, *ARM Architecture reference manual,* Addision Wesley.

IV B.Tech. II Semester

10BT71202: MOBILE COMPUTING

(ELECTIVE-IV)

L	T	P	C
4	-	-	4

UNIT –I: MOBILE COMPUTING

Introduction, History, architecture, devices and applications, limitations.

GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT –II: MEDIUM ACCESS CONTROL

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT –III: WIRELESS LAN

Infrared vs. radio transmission, Infrastructure and ad hoc networks, IEEE 802.11. HiperLAN: Protocol architecture, physical layer, Channel access control sub-layer, MAC sub-layer, Information bases and networking.

Bluetooth: User scenarios, physical layer, MAC layer, networking, security, link management.

UNIT –IV: MOBILE NETWORK AND TRANSPORT LAYERS

Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT –V: DATABASE ISSUES

Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT –VI: DATA DISSEMINATION

push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT –VII: MOBILE AD HOC NETWORKS (MANETS)

Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs

UNIT –VIII: PROTOCOLS AND TOOLS

Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers) and J2ME.

TEXT BOOKS:

1. Rajkamal, *Mobile Computing,* 2nd Edition, OXFORD University Press, 2008.
2. Jochen Schiller, *Mobile Communications,* 2nd Edition, Pearson Education, 2003.

REFERENCE BOOKS:

1. Stojmenovic and Cacute, *Handbook of Wireless Netowrks and Mobile Computing,* John Wiley, 2002.
2. Hansman, Merk, Nicklous, Stober, *Principles of Mobile Computing,* 2nd Edition, Springer, 2003.

IV B.Tech. II Semester

10BT81503: SOFTWARE REENGINEERING

(ELECTIVE – IV)

L	T	P	C
4	-	-	4

UNIT - I: SOFTWARE, SOFTWARE EVOLUTION AND MAINTENANCE

Software, Legacy software, Well designed software, Software evolution challenges, Lehman's laws, Software deterioration curve. Software maintenance: Software change, Types of change encountered during the support phase, Maintenance costs, Factors affecting maintenance, Maintenance process, Change and maintenance prediction.

UNIT - II: SOFTWARE QUALITY FACTORS, QUALITY AND MAINTAINABILITY METRICS

Internal and external attributes, McCall's quality factors, ISO 9126 quality factors, Need and importance of quality and maintainability metrics, Metric for software correctness (Defects/KLOC), Metric for software integrity, Software reliability (MTBF), Metrics for maintainability (Mean-time-to-change (MTTC), Spoilage metric, Software maturity index, McCabe and Halstead metrics). Design maintainability: Cohesion, Coupling, Understandability and Adaptability.

UNIT - III:LEGACY SOFTWARE STRUCTURE, SOFTWARE REENGINEERING PROCESS MODEL

Software change strategies include: Software maintenance, Architectural transformation, Software reengineering. Legacy software structure and distribution: Ideal structure, Real structure, Layered distribution model, Legacy software distribution, Architectural problems. Business process reengineering: Business processes, A BPR Model. Software reengineering and its importance, Goals of reengineering, A software reengineering process model , Software reengineering activities.

UNIT - IV: DESIGN EXTRACTION

Reverse Engineering: Goals of reverse engineering, Reverse engineering process, Reverse engineering to understand processing, Code duplication detection, Reverse engineering to understand data, Reverse engineering user interfaces, Design extraction with UML, Heuristics to extract the design, Tools for reverse engineering.

UNIT - V: RESTRUCTURING (IN TRADITIONAL CONTEXT)
Code restructuring: Characteristics of unstructured code, Characteristics of structured code, Spaghetti logic, Structured control logic, Restructuring problems, Flow graph restructuring, Warner's logical simplification techniques, Some basic code restructuring methods: Interchange, Transposition, Combination, Resolution, Substitution. Data restructuring (Data reengineering): Data reengineering process, Data problems, Approaches: Data cleanup, Data extension, Data migration. Tools for restructuring.

UNIT - VI: REFACTORING (RESTRUCTURING IN OBJECT ORIENTED CONTEXT)
Introduction, Principles in refactoring: Problems with refactoring, Refactoring and design, Refactoring and performance. Refactoring opportunities, Top ten of code bad smells, Different refactorings and their use, Refactoring tools.

UNIT - VII: FORWARD ENGINEERING
Introduction, Goals of forward engineering, Forward engineering for client/server applications, Forward engineering for object oriented architectures, Forward engineering user interfaces, Tools for forward engineering.

UNIT - VIII: REENGINEERING METRICS, REPOSITORIES, AND ECONOMICS
Metrics in Reengineering: Introduction, Metrics as a reengineering tool, Which metrics to collect ?(Goal Question Metric (GQM) paradigm), Reengineering repositories: Introduction, Taxonomy (Functionality + Integration options), Issues. Reengineering economics.

TEXT BOOKS:

1. Ed. Robert S. Arnold, *Software Reengineering,* IEEE Computer Society, 1993.
2. Tom Mens, Serge Demeter, *Software Evoluation,* Springer publication Company, 2008.

REFERENCE BOOKS:

1. Ian Sommerville, *Software Engineering,* 8th Edition, Addision-Wesley.
2. Roger S. Pressman, *Software Engineering, A Practitioner's Approach,* 7th Edition.
3. Martin Fowler, K.Beck, J.Brant, W.Opdyke, D. Roberts, *Refactoring: Improving the Design of Existing Code,* Addition-Wesely, NY, 1999.
4. Georg Abfalter, VDM Verlag, *Software Reengineering,* Germany, 2008.
5. Salvatore Valenti, *Successful Software Reengineering,* IRM Press, 2002.
6. J.D.Warnier, Vam Nostrand-Reinhold, *Logical Construction of Programs,* 1974.
7. Robert E.Arnold, *Tutorial on Software Restructuring,* IEEE Computer Society, 1986.

IV B.Tech. II Semester

10BT81504: GRID COMPUTING

(ELECTIVE-IV)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION OF GRID COMPUTING
The Grid - Past, Present, Future, A New Infrastructure for 21st Century Science - The Evolution of the Grid - Grids and Grid Technologies, Programming models, A Look at a Grid Enabled Server and Parallelization Techniques – Grid applications.

UNIT-II: GRID COMPUTING WORLDWIDE INITIATIVES
Organizations developing Grid standards and best practice Guidelines, Global Grid forum(GGF), Organizations developing grid computing toolkits and the framework, Organizations building and using grid based solutions to solve computing, data and network requirements.

UNIT-III: THE GRID COMPUTING ANATOMY
The concept of virtual organizations-Grid architecture-Grid architecture and relationship to other Distributed technologies-computational and data Grids semantic grids. The Grid computing Road Map: Autonomic computing, Business on Demand and Infrastructure Virtualization, Service-oriented Architecture and grid, semantic Grids.

UNIT-IV: THE NEW GENERATION OF GRID COMPUTING APPLICATIONS
Merging the grid services architecture with the web services architecture, service-oriented architecture, web services architecture, XML related technologies, XML messages and enveloping, service message description mechanisms.

UNIT-V: THE GRID COMPUTING TECHNOLOGICAL VIEWPOINTS
Open grid services architecture (OGSA), sample use cases that drive the OGSA- Commercial data center (CDC), National fusion collaboratory (NFC), Online Media and Entertainment. The OGSA Platform Components: Native Platform Services and Transport Mechanisms, OGSA Hosting Environment, Core Networking Services Transport and Security, OGSA Infrastructure and Services.

UNIT-VI: THE OPEN GRID SERVICES INFRASTRUCTURE
Grid Services, A High level Introduction to OGSI, Technical details of OSGI specification, service data concepts, Naming and change management recommendations-OGSA basic services.

UNIT-VII: OGSA BASIC SERVICES

Common Management Model(CMM)-Manageability Interfaces, Domain-Specific Interfaces, New Constructs for Resource Modeling, CMM-Defined manageability Interfaces, resource Modeling concepts, Resource Lifecycle Modeling, resource Grouping Concepts in CMM, Relationship and Dependency among Resources, services Domains, Policy Architecture, Security Architecture, metering and Accounting, Common Distributed Logging, Distributed Data Access and Replication.

UNIT-VIII: THE GRID COMPUTING TOOLKITS, GLOBUS GT3 TOOLKIT: ARCHITECTURE

GT3 Software Architecture Model-Default server-side Framework, Globus GT3 Architecture Details, Grid Service Container, OGSI Reference Implementation, security Infrastructure, Transport-level Security, Message-level SecurIty, Security Directions, system-level Services, Hosting Environments, Load Balancing Features in GT3,Client-Side Framework, Message Preprocessing Handlers.

TEXT BOOK:

1. Joshy Joseph, Craig Fallen stein, *Grid Computing,* Pearson Education, New Delhi, 2004.

REFERENCE BOOKS:

1. Fran Bermn, Geoffrey Fox, Anthony Hey J.G., *Grid Computing: Making the Global Infrastructure a Reality,* Wiley, USA, 2003.
2. Ian Foster, Carl Kesselman, Morgan Kaufman, *The Grid2: Blueprint for a New Computing Infrastructure,* New Delhi, 2004.
3. P. Venkata Krishna, M. Rajasekhara Babu and V. Saritha, *Grid Computing Concepts and Applications*, Ane Books, 2010.

IV B.Tech. II Semester

10BT71203: MULTIMEDIA AND APPLICATION DEVELOPMENT

(ELECTIVE-IV)

L	T	P	C
4	-	-	4

UNIT –I: INTRODUCTION TO MULTIMEDIA

Definition of multimedia, multimedia and hypermedia, World Wide Web, multimedia software tools, graphics and image data representations: graphics/image data types, file formats, color models in images, color models in video.

UNIT –II: FUNDAMENTAL CONCEPTS IN AUDIO AND VIDEO

Definition of sound, Digitization, Nyquist theorem, signal to noise ratio, signal to quantization-noise ratio, MIDI, types of video signals, analog video, digital video.

UNIT –III: ACTION SCRIPT-I:

Action Script 2.0 Features, Data types and type cheching: static typing, type syntax, compatible types, casting, Action Script 2.0 type checking, Classes: defining classes, constructor functions, properties, methods.

UNIT –IV: ACTION SCRIPT-II

Inheritance: A primer on inheritance, subclasses as subtypes, overriding methods and properties, constructor functions in subclasses, polymorphism and dynamic binding, Interfaces: introduction, syntax and use, Packages: syntax, defining packages, package access and classpath, Exceptions: the exception handling cycle, exception bubbling, finally block, nested exceptions, limitations.

UNIT –V: ACTION SCRIPT-III

Authoring an Action Script 2.0 class, An OOP Application Development, Using Components with Action Script 2.0, MovieClip Subclasses.

UNIT –VI: MULTIMEDIA DATA COMPRESSION-I

Lossless compression algorithms: introduction, basics of information theory, run length coding, variable length coding, dictionary based coding, arithmetic coding, lossless image compression, Lossy compression algorithms: quantization,transform coding,wavelet based coding.

UNIT –VII: MULTIMEDIA DATA COMPRESSION-II

Image compression techniques: JPEG standard, JPEG 2000, Audio compression techniques: ADPCM in speech coding, G.726 ADPCM, Vocoders, Video compression techniques: Introduction to video compression, video compression based on motion compensation, MPEG-1, MPEG-2.

UNIT –VIII: MULTIMEDIA NETWORK COMMUNICATIONS AND APPLICATIONS

Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MoD).

TEXT BOOKS:

1. Ze-Nain Li and Mark S. Drew, *Fundamentals of Multimedia,* Pearson Education, 2008.
2. Colin Moock, *Essentials ActionScript 2.0,* SPD O'Reilly, 2005.

REFERENCE BOOKS:

1. Nigel Chapman and Jenny Chapman, *Digital Multimedia,* 2nd Edition, Wiley Dreamtech, 2004.
2. Brian Underdahl, *Macromedia Flash MX,* TMH, 2002.
3. Fred Halsai, *Multimedia Communications,* Pearson, 2004.
4. K.R.Rao, Zoram S. Bojkovic, *Multimeida Communication Systems,* Pearson Education, 2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (yearly pattern)

Common to ECE, EEE, EIE, EConE , CSE, CSSE and IT

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT1BS04	Mathematical Methods	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer Programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer Programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics and Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language and Communication Skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering and IT Workshop	-	-	3	4	25	50	75
	TOTAL	**15**	**6**	**15**	**50**	**305**	**670**	**975**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

II B.Tech. I Semester

INFORMATION TECHNOLOGY

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT3BS01	Probability and Statistics	4	1	-	4	30	70	100
10BT30421	Electronic Devices and Circuits	4	1	-	4	30	70	100
10BT30221	Basic Electrical Engineering	4	1	-	4	30	70	100
10BT30422	Digital Logic Design	4	1	-	4	30	70	100
10BT30501	Discrete Mathematical Structures	4	1	-	4	30	70	100
10BT30502	Data Structures	4	1	-	4	30	70	100
10BT30431	Analog and Digital Electronics Lab	-	-	3	2	25	50	75
10BT30511	Data Structures Lab	-	-	3	2	25	50	75
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

II B.Tech. II Semester

INFORMATION TECHNOLOGY

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT3BS02	Environmental Sciences	4	1	-	4	30	70	100
10BT40501	Computer Architecture and Organization	4	1	-	4	30	70	100
10BT40502	Object Oriented Programming	4	1	-	4	30	70	100
10BT50504	Operating Systems	4	1	-	4	30	70	100
10BT41201	Data Communications	4	1	-	4	30	70	100
10BT60501	Theory of Computation	4	1	-	4	30	70	100
10BT40521	Operating Systems Lab	-	-	3	2	25	50	75
10BT40511	Object Oriented Programming Lab	-	-	3	2	25	50	75
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

III B.Tech. I Semester

INFORMATION TECHNOLOGY

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT4HS01	Managerial Economics and Principles of Accountancy	4	1	-	4	30	70	100
10BT4EC01	Optimization Techniques	4	1	-	4	30	70	100
10BT50502	Microprocessors and Interfacing	4	-	-	4	30	70	100
10BT50503	Database Management Systems	4	1	-	4	30	70	100
10BT51201	Software Engineering	4	-	-	4	30	70	100
10BT51202	Computer Graphics	4	-	-	4	30	70	100
10BT50511	Microprocessors and Interfacing Lab	-	-	3	2	25	50	75
10BT50512	Database Management Systems Lab	-	-	3	2	25	50	75
10BT4HS02	Advanced English Communication Skills (Audit Course)	-	3	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**28**	**230**	**520**	**750**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

III B.Tech. II Semester

INFORMATION TECHNOLOGY

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT70501	Principles of Compiler Design	4	1	-	4	30	70	100
10BT60502	Unix Programming	4	1	-	4	30	70	100
10BT60503	Data Warehousing and Data Mining	4	1	-	4	30	70	100
10BT61201	Object Oriented Analysis and Design	4	1	-	4	30	70	100
10BT61202	Computer Networks	4	1	-	4	30	70	100
10BT50501	Design and Analysis of Algorithms	4	1	-	4	30	70	100
10BT61211	Object Oriented Analysis and Design Lab	-	-	3	2	25	50	75
10BT61212	Unix and Computer Networks Lab	-	-	3	2	25	50	75
10BT61213	Seminar	-	-	-	2	75	-	75
	TOTAL	**24**	**6**	**6**	**30**	**305**	**520**	**825**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

IV B.Tech. I Semester

INFORMATION TECHNOLOGY

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT71201	Web Programming	4	1	-	4	30	70	100
10BT71202	Mobile Computing	4	1	-	4	30	70	100
10BT71203	Multimedia and Applications Development	4	1	-	4	30	70	100
10BT71204	Cryptography and Network Security	4	-	-	4	30	70	100
Elective-I		4	-	-	4	30	70	100
10BT71205	Parallel Computing							
10BT71206	E-Commerce							
10BT71207	Advanced Databases							
10BT71208	Software Project Management							
10BT71209	Enterprise Resource Planning							
Elective-II		4	-	-	4	30	70	100
10BT62301	Bio-informatics							
10BT71210	Embedded Systems Design							
10BT70402	Digital Image Processing							
10BT70502	Software Testing Techniques							
10BT80504	Cloud Computing							
10BT71211	Web Programming Lab	-	-	3	2	25	50	75
10BT71212	Multimedia and Applications Development Lab	-	-	3	2	25	50	75
10BT71213	Mini Project	-	-	-	2	25	50	75
10BT7HS01	Professional Ethics (Audit Course)	-	3	-	-	-	-	-
	TOTAL	**24**	**6**	**6**	**30**	**255**	**570**	**825**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

IV B.Tech. II Semester

INFORMATION TECHNOLOGY

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
Elective-III		4	-	-	4	30	70	100
10BT81201	Service Oriented Architecture							
10BT81202	Information Retrieval Systems							
10BT81203	Intellectual Property Rights							
10BT81204	Distributed Systems							
10BT81205	Middleware Technologies							
Elective-IV		4	-	-	4	30	70	100
10BT81206	Software Patterns							
10BT71504	Network Management							
10BT70505	Soft Computing							
10BT80502	Human Computer Interaction							
10BT81207	Wireless Networks							
10BT81211	Comprehensive Viva-Voce	-	-	-	2	100	-	100
10BT81212	Project Work	-	-	12	12	75	150	225
	TOTAL	**12**	**-**	**12**	**26**	**265**	**360**	**625**

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1BS04: MATHEMATICAL METHODS

(Common to CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT–I

Matrices and Linear System of Equations : Rank of a matrix, echelon form, normal form, inverse of a matrix by normal form. Homogenous and non-homogenous linear systems, consistency and solutions of linear system of equations. Direct methods, Gauss elimination method, Gauss Siedel, Gauss Jordan method, factorization method.

UNIT-II

Eigen Values and Eigen Vectors : Definitions, evaluation of eigen values, eigen vectors and properties. Cayley Hamilton theorem (without proof), inverse and powers of a matrix by Cayley Hamilton theorem, diagonalization of a matrix, quadratic forms and reduction to its normal form (problems dealing with distinct eigen values only).

UNIT-III

Algebraic, Transcendental Equations and Curve Fitting: Solutions of algebraic and transcendental equations by bisection method, false position method, Newton-Raphson's method, iterative method. Curve fitting by the principle of least squares, fitting of a straight line, parabola, exponential and power curves.

UNIT-IV

Interpolation: Interpolation, forward difference operator, backward difference operator, central difference operator, relationship between operators, Newton's forward formula, Newton's backward formula, Gauss forward formula, Gauss backward formula, Lagranges interpolation formula.

UNIT-V

Numerical Differentiation and Integration: Numerical values of derivatives using Newton's forward formula, Newton's backward formula.

Numerical Integration: Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule.

UNIT-VI

Numerical Solutions of Ordinary Differential Equations: Numerical solutions of ordinary differential equations using Taylor series, Euler's method, modified Euler's method, Runge–Kutta method (2^{nd} and 4^{th} orders only), Milne's predictor corrector method.

UNIT-VII

Z – Transformations: Z–transforms, inverse Z–transform, properties, damping rule, shifting rule, initial and final value theorems. Convolution theorem, solution of difference equations by Z–transforms.

UNIT-VIII

Fourier Series and Fourier Transforms: Definition, Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd function, half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, properties, inverse transform, finite Fourier transforms.

TEXTBOOK:

Mathematical Methods, T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, S.Chand and Company, 5^{th} edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36^{th} Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley and Sons, Inc., 8^{th} Edition
3. *Introductory methods of Numerical Analysis ,* S.S.Sastry, Prentice Hall of India, 3^{rd} Edition
4. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3^{rd} Edition

B.Tech. I Year

10BT1EC01: PROBLEM SOLVING AND COMPUTER PROGRAMMING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | $x^2 + y^2$| + $\sqrt{}$2xy
iii) $x^5 + 10\ x^4 + 8\ x^3 + 4\ x + 2$
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS01: PROBABILITY AND STATISTICS

L	T	P	C
4	1	-	4

UNIT-I: PROBABILITY AND MATHEMATICAL EXPECTATIONS

Introduction to Probability: Definition of Random Experiment, Events and Sample space, Definition of probability, Addition and Multiplication theorems, Conditional probability, Baye's Theorem, Simple Problems on Baye's theorem.

Random Variables: Discrete and Continuous random variables, Distribution function of random variable, Properties, Probability mass function, Probability density functions, Mathematical expectation, Properties of mathematical expectations, Mean and Variance.

UNIT-II: PROBABILITY DISTRIBUTIONS

Discrete Distributions: Binomial Distribution, Mean and Standard Deviations of Binomial Distribution, Poisson distribution, Mean and standard Deviations of Poisson distribution, Applications.

Continuous Probability Distributions: Uniform distribution, Exponential distribution, Normal distribution, Properties of Normal Distribution, Importance of Normal Distribution, Area properties of Normal curve.

UNIT-III: CORRELATION AND REGRESSION

Correlation: Definition, measures of correlation, Correlation for bivariate distribution, Rank correlation coefficients.

Regression: Simple linear regression, regression lines and properties.

UNIT-IV: SAMPLING DISTRIBUTIONS

Population and sample, parameter and statistic, Sampling distribution of statistic, Standard Error of statistic, Null and alternative hypotheses, Type I and II errors, Level of Significance, Critical region, Degrees of freedom.

UNIT-V: LARGE SAMPLE TESTS OF SIGNIFICANCE

Test of significance for single proportion, Test of significance for difference of proportions, Test of significance for a single mean, test of significance for difference of means and test of significance for difference of standard deviations.

UNIT-VI: SMALL SAMPLE TESTS OF SIGNIFICANE

Student's t-test, F-test for equality of population variance, chi-square test for goodness of test, contingency table, chi-square test for independence of attributes.

UNIT-VII: STATISTICAL QUALITY CONTROL

Introduction, Advantages and limitations of statistical quality control, Control charts, Specification limits, $\overline{X}$, R, np and c charts.

UNIT-VIII: QUEUING THEORY

Queuing Theory, Pure Birth and Death Process, M/M/1 Model, Problems.

TEXT BOOKS :

1. T.K.V. Iyengar, B. Krishna Gandhi and Others, *Probability and Statistics,* S. Chand and Company, 3rd edition, 2011.

2. Shahnaz Bathul, *A text book of Probability and Statistics,* Ridge Publications, 2nd edition.

3. Kandaswamy and Thilagavathy, *Probability Statistics and Queuing Theory,* S.Chand, New Delhi, Latest edition.

REFERENCE BOOKS:

1. Miller and John E. Freund's, *Probability and Statistics for Engineers,* Pearson Education, 2009.
2. Ronald E. Walpole, *Probability and Statistics for Engineers and Scientists,* Pearson Education India, 2002.
3. S.C.Gupta and V.K.Kapoor, *Fundamentals of Mathematical Statistics,* Sutan and Chand, New Delhi, 2004.
4. S.C.Gupta and V.K.Kapoor, *Fundamentals of Applied Statistics,* Sultan and Chand, New Delhi, 1998.

II B.Tech. I Semester

10BT30421: ELECTRONIC DEVICES AND CIRCUITS

L	T	P	C
4	1	-	4

UNIT-I: PN JUNCTION DIODE

PN Junction Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical, Static and Dynamic Resistances, Diode Equivalent circuits, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

UNIT-II: RECTIFIERS AND FILTERS

PN Junction as a Rectifier, Halfwave rectifier, ripple factor, Fullwave rectifier, Bridge Rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-section filter, pi-section filter, Use of Zener Diode as a Regulator.

UNIT-III: BIPOLAR JUNCTION TRANSISTOR (BJT)

Transistor construction, BJT Operation, BJT Symbol, Transistor as an Amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in CB, CE and CC Configurations, BJT specifications.

UNIT-IV: TRANSISTOR BIASING AND STABILIZATION

Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in V_{BE} and β.

UNIT-V: BIPOLAR JUNCTION TRANSISTOR AMPLIFIERS

BJT Hybrid Modeling for CB, CE and CC Configurations, Determination of h-Parameters from Transistor Characteristics, Comparison of CB, CE and CC configurations, Simplified Hybrid Model.

UNIT-VI: FIELD EFFECT TRANSISTOR

Junction Field Effect Transistor (Construction, Principle of Operation, Symbol) - Pinch-Off Voltage - Volt-Ampere Characteristics, MOSFET Characteristics in Enhancement and Depletion Modes, Small Signal Model of JFET & MOSFET.

FET AMPLIFIERS: Common Source, and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, Comparison between BJT and FET.

UNIT-VII: FEEDBACK AMPLIFIERS AND OSCILLATORS (Qualitative Treatment)

Feedback Concepts, Types of Feedback Circuits (block diagram representation), General characteristics of negative feedback amplifier, Effect of Feedback on Amplifier characteristics. Barkhausen criterion, Hartley & Colpitts oscillators, Phase Shift Oscillators and Crystal Oscillator.

UNIT-VIII: SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR) and applications.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits,* 1991 edition, TMH, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits*, 9th edition, PHI, 2006.
3. David A. Bell, *Electronic Devices and Circuits*, 5th edition, Oxford University press, 2008.

REFERENCE BOOKS:

1. J. Millman and Christos C. Halkias, *Integrated electronics*, 1st edition, TMH, 2004.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2nd edition, BSP, 2005.
3. Rober T. Paynter, *Introduction to Electronic Devices and Circuits*, Pearson Education.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd edition, TMH, 2008.

II B.Tech. I Semester

10BT30221: BASIC ELECTRICAL ENGINEERING

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO ELECTRICAL ENGINEERING

Essence of electricity - Basic circuit components - Basic definitions: Electric field - Electric Current - Potential and potential difference - EMF - electric power - Ohm's law - resistive networks - Inductive networks - capacitive networks - Kirchoff's laws - series parallel circuits - star delta and delta star transformations - fuses - earthing.

UNIT-II: NETWORK ANALYSIS

Basic Definitions: Node - Path - Loop - Branch - Nodal analysis- Mesh analysis- Source Transformation Technique -Problems.

Network Theorems: Superposition - Thevenin's - Maximum Power Transfer Theorems.

UNIT-III: ALTERNATING QUANTITIES

Principle of AC voltages - wave forms and basic definitions - RMS and average values of alternating currents and voltage - form factor and Peak factor - phasor representation of alternating quantities - the J operator and phasor algebra - analysis of AC circuits with single basic network element - single phase series and parallel RLC circuits - power factor.

UNIT-IV: THREE PHASE CIRCUITS

Introduction - polyphase systems - advantages - star and delta connection - voltages and currents in balanced star and delta connections - numerical problems - advantages of star and delta connections.

UNIT-V: DIRECT CURRENT MACHINES

Constructional details of a DC machine - principle of operation of a DC generator - types of DC generators - emf equation of a generator - Applications.

DC motors - Principle of operation - types of DC motors - Torque equation - losses and efficiency-Applications.

UNIT-VI: ALTERNATING CURRENT MACHINES

Transformers - principle of operation - constructional details - losses and efficiency - regulation of transformer - testing of Transformers: OC and SC test- Simple problems.

Three phase Induction motors: Constructional details- principle of operation - slip - rotor frequency.

UNIT-VII: SPECIAL MACHINES

Single phase induction motors - Principle of operation - Shaded pole motors - Capacitor motors - AC servomotor - AC tachometers - Synchros - Stepper Motors - Characteristics - voltage stabilizers, uninterruptible power supply (UPS).

UNIT-VIII: BASIC MEASURING INSTRUMENTS

Introduction - classification of instruments - operating principles - essential features of measuring instruments - Permanent Magnet Moving Coil (PMMC) and moving iron instruments (voltmeters and ammeters) - Digital multimeters.

TEXT BOOKS:

1. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering,* Oxford University press, 2009.
2. BL Theraja and AK Theraja, *A text book of electrical technology in SI units*, vol: 2, 2010.

REFERENCE BOOKS:

1. D.P. Kothari and I. J. Nagrath, *Theory and problems of Basic Electrical Engineering,* Prentice Hall of India, 2009.
2. V.K. Mehta, Rohit Mehta, *Principles of electrical engineering,* S. Chand and Company Ltd., 2006
3. V.K. Mehta, Rohit Mehta, *Principles of power systems,* S. Chand and Company Ltd., 2006.
4. M.S. Naidu and S. Kamakshaiah, *Basic Electrical Engineering,* Tata McGraw Hill Publications Ltd, 2009.

II B.Tech. I Semester

10BT30422: DIGITAL LOGIC DESIGN

L	T	P	C
4	1	-	4

UNIT-I: BINARY SYSTEMS
Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.

UNIT-II: BOOLEAN ALGEBRA AND LOGIC GATES
Basic Definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gates, integrated circuits.

UNIT-III: GATE – LEVEL MINIMIZATION
The k-map method - Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function, Hardware Description language (HDL).

UNIT-IV: COMBINATIONAL LOGIC
Combinational Circuits, Analysis procedure, Design procedure, Binary Adder-Subtractor , Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers,HDL for combinational circuits.

UNIT-V: SYNCHRONOUS SEQUENTIAL LOGIC
Sequential circuits, latches, Flip-Flops, Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure.

UNIT-VI: REGISTERS AND COUNTERS
Registers, shift Registers, Ripple counters, synchronous counters, other counters, HDL for Registers and counters.

UNIT-VII: MEMORY AND PROGRAMMABLE LOGIC
Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction, Read-only memory, Programmable logic Array, programmable Array logic, Sequential Programmable Devices.

UNIT-VIII: ASYNCHRONOUS SEQUENTIAL LOGIC
Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race- Free State Assignment Hazards, Design Example.

TEXT BOOKS:

1. M. Morris Mano, *Digital Design,* 3rd edition, Pearson Education/ PHI, 1999.
2. Roth, *Fundamentals of Logic Design*, 5th edition, Thomson, 2004.

REFERENCE BOOKS:

1. Zvi. Kohavi, *Switching and Finite Automata Theory*, Tata McGraw Hill, 2004.
2. C.V.S. Rao, *Switching and Logic Design*, 3rd edition, Pearson Education, 2009.
3. Donald D.Givone, *Digital Principles and Design*, Tata McGraw Hill, 2002.
4. M. Rafiquzzaman, *Fundamentals of Digital Logic and Micro Computer Design*, 5th edition, John Wiley, 2005.

II B.Tech. I Semester

10BT30501: DISCRETE MATHEMATICAL STRUCTURES

L	T	P	C
4	1	-	4

UNIT–I: MATHEMATICAL LOGIC

Statements and notations, Connectives, Well formed formulae, Truth Tables, Tautology, Equivalence of formulae, Normal forms.

UNIT-II: PREDICATES

Predicate Calculus, Free and Bound variables, Rules of inference, Consistency, Proof of contradiction and Automatic Theorem Proving.

UNIT-III: RELATIONS

Properties of binary relations, Equivalence relations, Compatibility relations, Partial ordering relations, Hasse diagram and related applications.

Functions: Inverse Functions, Composition of functions, Recursive functions, Lattice and its Properties.

UNIT-IV: ALGEBRAIC STRUCTURES

Algebraic System-Examples and General Properties Semi Groups and Monoids, Groups, Subgroups, Homomorphism and Isomorphism.

UNIT-V: MATHEMATICAL REASONING

Methods of Proof, Mathematical Induction.

Counting: Basics of counting, The Inclusion- Exclusion Principle, The Pigeon hole principle, Permutations and Combinations, Generalized Permutations and Combinations.

UNIT-VI: RECURRENCE RELATIONS

Generating Functions of Sequences, Calculating coefficients of Generating function, Recurrence relation, solving recurrence relations by substitution and Generating functions, Methods of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relation.

UNIT-VII: GRAPHS

Introduction to Graphs, Types of Graphs, Graph basic terminology

and Special types of simple graphs, Representation of Graphs and graph Isomorphism, Euler Paths and Circuits, Hamiltonian Paths and Circuits, Planar Graphs, Euler's Formula and Graph Coloring, 4-color theorem, 5-color theorem.

UNIT-VIII: GRAPH THEORY AND ITS APPLICATIONS

Introduction to Trees, Properties of Trees, Applications of Trees, Spanning Trees, Counting trees, Depth-First Search, Breadth-First Search, Minimum Spanning Trees, Kruskal's Algorithm and Prim's Algorithm.

TEXT BOOKS:

1. J.P. Trembly and R. Manohar, *Discrete Mathematical Structures with Applications to Computer Science,* Tata McGraw Hill, 1997.
2. Kenneth H. Rosen, *Discrete Mathematics and its Applications,* 6th edition, Tata McGraw Hill, 2007.

REFERENCE BOOKS:

1. Joe L.Mott and Abraham Kandel, *Discrete Mathematics for Computer Scientists and Mathematicians,* 2nd edition, Prentice Hall of India Private Limited, 2004.
2. C.L. Liu and D.P. Mohapatra, *Elements of Discrete Mathematics,* 3rd edition, McGraw Hill, 2008.
3. Ralph P. Grimaldi and B.V.Ramana, *Discrete and Combinatorial Mathematics- An Applied Introduction,* 5th edition, Pearson Education, 2006
4. D.S Mallik and M. K Sen, *Discrete Mathematical Structures: Theory and Applications,* Course Technology, 2004.

II B.Tech. I Semester

10BT30502: DATA STRUCTURES

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO DATA STRUCTURES

Definition, Classification, The Abstract Data Type (ADT), model for ADT, ADT implementation, Generic code for ADTs.

Sorting: Sort concepts, Merge sort, Shell sort, Quick sort, Heap sort.

Searching: Sequential search, variations on sequential search, Binary search, Fibonacci search.

UNIT-II: GENERAL LINEAR LISTS

Singly linked list, Basic Operations, Implementation, List ADT, Circularly linked lists, Doubly linked lists, Multi linked lists.

UNIT-III: STACKS AND QUEUES

Basic stack operations, Stack linked list, implementation, Stack ADT, Applications: Reversing data, Convert Decimal to binary, Postponement.

Queues: Queue operations, Queue linked list design, Queue ADT, Applications: Categorizing data, Queue simulations.

UNIT-IV: NON LINEAR LISTS

Basic tree concepts, Binary trees: properties, traversals, expression trees, Binary search trees: Basic concepts, Operations, Binary Search Tree ADT, Threaded trees.

UNIT-V: AVL TREES

Basic Concepts, Balance Factor, implementation, ADT, Algorithms, And Applications: Count words.

Heaps: Basic Concepts, Implementation, ADT, Heap Application.

UNIT-VI: MULTIWAY TREES

M-way search trees, B-trees: Implementation- Insertion, Deletion, Balance, Combine, Traversal, Search, B-tree ADT, Simplified B-trees, lexical search trees.

UNIT-VII: GRAPHS

Basic Operation, Review of traversals- Breadth First Traversal, Depth First Traversal, Graph storage structures, Graph ADT, Networks: Minimum spanning trees, Shortest path algorithm.

UNIT-VIII: HASH TABLES

Introduction, Hash Table structure, Hash functions, Linear open Addressing, Chaining, Applications.

File Organizations: Introduction, Files, Keys, Basic File Operations, Heap Organization, Sequential File Organization, Indexed Sequential File Organization, Direct File Organization.

TEXT BOOKS:

1. Richard F.Gilberg, Behrouz A.Forouzan, *Data Structures- A pseudocode Approach with C,* 2nd edition, Cengage Learning, 2007.
2. G.A.V. Pai, *Data Structures and Algorithms,* Tata McGraw Hill, 2009.

REFERENCE BOOKS:

1. J. Tremblay, P. Sorensen, *An introduction to data structures with Applications,* 2nd edition, Tata McGraw-Hill, 1984.
2. M. Weiss, *Data Structures and Algorithm Analysis in C++,* 2nd edition, Pearson Education, 2002.
3. E. Horowitz, S. Sahni, D. Mehta,*Fundamentals of Data Structures in C++,* Galgotia Book Source, New Delhi, 1995.
4. Y. Langsam, M. Augenstin and A. Tannenbaum, *Data Structures using C and C++,* 2nd edition, Prentice Hall of India, 2002.
5. A. Drozdek, Thomson Brookes, *Data Structures in C++,* 2nd edition, COLE Books, 2002.

II B.Tech. I Semester

10BT30431: ANALOG AND DIGITAL ELECTRONICS LAB

L	T	P	C
-	-	3	2

PART A

ELECTRONIC WORKSHOP PRACTICE (Only for Viva-Voce)

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards. Identification, Specifications and Testing of Active Devices: Diodes, BJTs, Low-power JFETs, MOSFETs, LEDs, LCDs, SCR, UJT, Linear and Digital ICs.

PART B

ANALOG DEVICES AND CIRCUITS (Minimum seven experiments to be conducted)

1. PN Junction and Zener diodes characteristics
2. Ripple Factor and Load Regulations of Rectifier with and without filters (Full wave or Half wave)
3. Input and Output characteristics of Transistor in CE configuration
4. Drain and Transfer Characteristics of JFET
5. Gain and Frequency response of CE Amplifier
6. Gain and Frequency response of Feedback Amplifier (Voltage series or current series)
7. Frequency of oscillations of Hartley and Colpitts Oscillator
8. UJT relaxation oscillator
9. SCR characteristics

PART C

DIGITAL CIRCUITS

Realization of

1. Flip Flops using Logic Gates
2. Two Problems on Combinational Circuits
3. Asynchronous Counter
4. Synchronous Counter

Demonstration of

5. VHDL Programme

II B.Tech. I Semester

10BT30511: DATA STRUCTURES LAB

L	T	P	C
-	-	3	2

1. a. Implement Quick sort algorithm on the list L={67, 78, 34, 11, 99, 42, 56, 23}and display the output list at the end of each pass.

   b. Implement Merge sort algorithm on the lists L1={ 123, 678, 345, 225, 890, 650,111 }, L2= {654, 789, 912, 144, 255, 666}

2. a. Implement Heap sort for the list L= {H, V, A, T, L, M, K, U}

   b. Implement Heap sort for the list L of Week1 (a).

3. Implement binary search and Fibonacci search algorithms on an order list L={2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20} Undertake search for the elements in the list { 3, 18,1,25}. Compare the number of keys comparisons made during the searches.

4. Write a program to implement the following operations on singly linked list

   i) Creation

   ii) Insertion

   iii) Deletion

   iv) Display

5. Write a menu driven program which will maintain a list of car models, their price, name of the manufacturer, engine capacity etc., as a doubly linked list. The menu should make provisions for inserting information pertaining to new car models, delete obsolete models, update data such as price besides answering queries such as listing all car models with in a price range specified by the client and listing all details given a car model.

6. Write a C program to implement the following using an array.

   i) Stack ADT ii) Queue ADT

7. Write a C program to implement the following using a single linked list.

   i) Stack ADT ii) Queue ADT

8. Write a C program to perform the following operations:

   i) Insert an element into a binary search tree.

   ii) Delete an element from a binary search tree.

   iii) Search for a key element in a binary search tree.

9. Write a C program that uses recursive functions to traverse the given binary tree in

   i) Preorder ii) Inorder iii) Postorder (Non recursive)

10. Write a C program to perform the following operation.

    i) Insertion into an AVL - tree

    ii) Deletion from an AVL - tree

11. Write a C program to perform the following operations

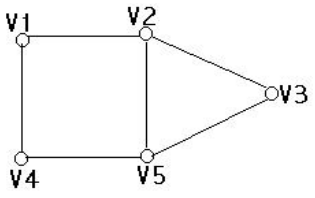
    i) Insertion into a B - tree

    ii) Deletion from a B - tree

12. Write a C program for the implementation of BFS (Breadth First Search) and DFS (Depth First Search) for a given adjacency matrix.

    Adjacency Matrix for a Simple Graph**:**

    Example : Given a graph G as follows



	V1	V2	V3	V4	V5
V1	0	1	0	1	0
V2	1	0	1	0	1
V3	0	1	0	0	1
V4	1	0	0	0	1
V5	0	1	1	1	0

From the chart above, the adjacency matrix for the graph G is:

0	1	0	1	0
1	0	1	0	1
0	1	0	0	1
1	0	0	0	1
0	1	1	1	0

13. a. Implement a hash table using an array data structure. Design functions to handle overflows using i) linear probing ii) quadratic probing iii) rehashing for a set of keys.

    b. Implement a hash table for a given set of keys using chaining method of handling overflows. Maintain the chains in the ascending order of keys. Design a menu driven front end to perform the insert, delete, and search operations on the hash table.

TEXT BOOKS:

1. Richard F.Gilberg , Behrouz A.Forouzan, *Data Structures- A pseudocode Approach with C,* 2nd edition, Cengage Learning, 2007.
2. G.A.V. Pai, *Data Structures and Algorithms,* Tata McGraw Hill, 2009.

REFERENCE BOOKS:

1. J. Tremblay, P. Sorensen, *An introduction to data structures with Applications,* 2nd edition, Tata McGraw-Hill, 1984.
2. M. Weiss, *Data Structures and Algorithm Analysis in C++,* 2nd edition, Pearson Education, 2002.
3. E. Horowitz, S. Sahni, D. Mehta,*Fundamentals of Data Structures in C++,* Galgotia Book Source, New Delhi, 1995.
4. Y. Langsam, M. Augenstin and A. Tannenbaum, *Data Structures using C and C++,* 2nd edition, Prentice Hall of India, 2002.
5. A. Drozdek, Thomson Brookes, *Data Structures in C++,* 2nd edition, COLE Books, 2002.

II B.Tech. II Semester

10BT3BS02: ENVIRONMENTAL SCIENCES

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES

Definition and concept of the term environment - Various components of environment - Abiotic and biotic - Atmosphere - Hydrosphere - Lithosphere - Biosphere - Inter relationships - Need for public awareness - Role of important national and international individuals and organizations in promoting environmentalism.

UNIT-II: NATURAL RESOURCES, CONSERVATION AND MANAGEMENT

Renewable and Non renewable resources and associated problems - Forests: Deforestation, Causes, effects and remedies - Effects of mining, dams and river valley projects - case studies; Water resources: Water use and over exploitation - Conflicts over water - Large dams - benefits and problems; Food resources : World food problems - Adverse effects of modern agriculture - Fertilizer and pesticide problems; Land resources: Land degradation - Land slides- Soil erosion - desertification- water logging - salinity - Causes, effects and remedies; Mineral resources: Mining - Adverse effects; Energy resources: Growing needs - Renewable and Non renewable resources - Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear energy, Hydrogen fuel and Solar energy - Impact on environment - Sustainable life styles.

UNIT-III: ECOLOGY AND ECOSYSTEMS

Definitions and concepts - Characteristics of ecosystem - Structural and functional features - Producers, consumers and decomposers and food webs - Types of ecosystems - Forests grassland, desert, crop land, pond, lake, river and marine ecosystems - Energy flow in the ecosystem - Ecological pyramids - Ecological successions.

UNIT-IV: BIO DIVERSITY, CONSERVATION AND MANAGEMENT

Introduction - Definition and concept of biodiversity - Value of biodiversity - Role of biodiversity in addressing new millennium challenges - Global, national biodiversity - Hot spots of biodiversity

Threats to biodiversity - Man and wild life conflicts - Remedial measures - Endemic, endangered and extinct species - In-situ and ex-situ conservation of biodiversity.

UNIT-V: ENVIRONMENTAL POLLUTION AND CONTROL

Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution - Solid waste management - Causes, effects, control and disposal methods - Role of individuals in the prevention of pollution - Hazards and disaster management - Floods - Earthquakes - Tsunamis - Cyclones - Land slides - Case studies.

UNIT-VI: SOCIAL ISSUES AND THE ENVIRONMENT

Concept of sustainable development - Methods of rainwater harvesting - Watershed management - Waste land reclamation - Green cover - Green power - Green technology - Resettlement and rehabilitation of people and related problems - Case studies - Issues and possible solutions - Greenhouse effect and global warming - Carbon credits - Acid rains - Ozone layer depletion - Causes, effects and remedies - Consumerism and waste production - Environment protection acts - Air act - Water act - Forest conservation act - Wild life protection act - Issues involved in the enforcement.

UNIT-VII: HUMAN POPULATION AND ENVIRONMENT

Population growth and its impact on environment - Environmental ethics - Family welfare programmes - Human health: T.B., Cancer, HIV/AIDS - Causes, effects and remedies - Occupational health hazards - Human rights - Important international protocols and conventions on environment.

UNIT-VIII:

FIELD WORK/ENVIRONMENTALIST'S DIARY/ASSIGNMENTS/SEMINARS

TEXT BOOKS:

1. Erach Barucha, *Environmental Studies,* 1st edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies,* 3rd edition, New Age International Publishers, 2011.

REFERENCE BOOKS:

1. Desh wal, *Environmental Studies,* 2nd edition, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1st edition, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies,* 2nd edition, Tata McGraw-Hill, New Delhi, 2010.

II B.Tech. II Semester

10BT40501:COMPUTER ARCHITECTURE AND ORGANIZATION

L	T	P	C
4	1	-	4

UNIT-I: STRUCTURE OF COMPUTERS

Computer Types, Functional Units, Basic Operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputers.

Computer Arithmetic**:** Review of Representation of Information, Addition and Subtraction, Multiplication and Division Algorithms, Floating-Point Arithmetic Operation, Decimal Arithmetic Unit, Decimal Arithmetic operations.

UNIT-II: REGISTER TRANSFER AND MICRO-OPERATIONS

Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit, Instruction Codes, Computer Registers, Computer Instructions, Instruction Cycle, Timing and Control, Memory-Reference Instructions, Input-Output and Interrupt.

Central Processing Unit: Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). Comparison of RISC and CISC.

UNIT-III: MICROPROGRAMMED CONTROL

Control Memory, Address Sequencing, Micro-program Example, Design of Control Unit, Hardwired Control, Micro-programmed Control, Nanoprogramming.

UNIT-IV: PIPELINE AND VECTOR PROCESSING

Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data Path & Control Consideration, Superscalar Operations, Vector Processing, Array Processors.

UNIT-V: THE MEMORY SYSTEM

Basic Concepts, Semiconductor RAM, Types of Read-only Memory (ROM), Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage, and Introduction to Redundant Array of Inexpensive Disks (RAID).

Input - Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA).

UNIT-VI: INPUT-OUTPUT ORGANIZATION (ADVANCED)

Input-Output Processor (IOP), Serial communication, Introduction to peripheral component Interconnect (PCI) bus, Introduction to Standard Serial Communication Protocols Like RS232, USB, and IEEE1394.

UNIT-VII: MULTIPROCESSORS

Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Cache Coherance, Shared Memory Multiprocessors.

UNIT-VIII: CASE STUDIES

CISC Architecture - PentiumIV, RISC Architecture - PowerPC.

TEXT BOOKS :

1. M. Moris Mano, *Computer System Architecture*, 3rd edition, Pearson/PHI, 2008.
2. William Stallings, *Computer Organization and Architecture*, 6th edition, Pearson/PHI.

REFERENCE BOOKS:

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, *Computer Organization*, 5th edition, McGraw Hill, 2002.
2. Andrew S. Tanenbaum, *Structured Computer Organization*, 4th edition, PHI/Pearson
3. Sivarama P. Dandamudi, *Fundamentals of Computer Organization and Design*, Springer Int. Edition, 2003.
4. John P. Hayes, *Computer Architecture and Organization*, 3rd edition, Tata McGraw Hill, 1998.

II B.Tech. II Semester

10BT40502:OBJECT ORIENTED PROGRAMMING

L	T	P	C
4	1	-	4

UNIT-I: OBJECT ORIENTED THINKING

Need for OOP paradigm, OOP concepts, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions. C++ class overview-class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation.

UNIT-II: POLYMORPHISM AND INHERITANCE

Function overloading, operator overloading, generic programming-function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, abstract classes, Streams.

UNIT-III: BASICS OF JAVA

History of Java, Java buzzwords, datatypes, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects - concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT-IV: INHERITANCE AND INTERFACES

Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables

in interface and extending interfaces.

UNIT-V: EXCEPTION HANDLING

Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

UNIT-VI: MULTITHREADING

Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads.

Applets: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets, Graphics class.

UNIT-VII: EVENT HANDLING

Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels - scrollpane, dialogs, menubar, graphics, layout manager - boarder, grid, flow, card and grid bag.

UNIT-VIII: SWINGS

Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing - Japplet, JFrame and JComponent, Icons and labels, text fields, The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Robert Lafore, *Object-Oriented Programming in C++,* 3rd edition, Waite Group.
2. Herbert schildt, *Java the complete reference,* 7th editon, TMH.

REFERENCE BOOKS:

1. Y. Daniel Liang, *Introduction to Java programming,* 6th edition, Pearson Education.
2. Core Java 2, Vol 1, *Fundamentals, Cay.S.Horstmann and Gary Cornell,* 7th edition, Pearson Education.
3. S.B.Lippman, *C++ primer,* 3rd edition, Pearson Education ltd.
4. W.Savitch, *Problem solving with C++,* The OOP, 4th edition, Pearson Education.
5. B. Stroustrup, *The C++ Programming Language,* 3rd edition, Pearson Education.

II B.Tech. II Semester

10BT50504: OPERATING SYSTEMS

L	T	P	C
4	1	-	4

UNIT-I: OPERATING SYSTEMS OVERVIEW

Introduction, Operating system operations, Process management, Memory management, Storage management, Protection and Security, Distributed Systems, Special purpose systems.

Operating systems structures: Operating system services and Systems calls, System programs, Operating system structure, Operating systems generations.

UNIT-II: PROCESS MANAGEMENT

Process concepts, Process state, Process control block, Scheduling queues, Process scheduling, Multithreaded programming, threads in UNIX, Comparison of UNIX and Windows.

UNIT-III: CONCURRENCY AND SYNCHRONIZATION

Process synchronization, Critical-section problem, Peterson's Solution, Synchronization Hardware, semaphores, Classic problems of synchronization, Readers and Writers problem, Dining-philosophers problem, Monitors, Synchronization examples(Solaris), atomic transactions. Comparison of UNIX and Windows.

UNIT-IV: DEADLOCKS

System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock- bankers algorithm.

UNIT-V: MEMORY MANAGEMENT

Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, Allocation of frames, Thrashing, case study-UNIX.

UNIT-VI: FILE SYSTEM

Concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and Windows

UNIT-VII: I/O SYSTEM

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling algorithms, swap-space management, stable-storage implementation, Tertiary storage structure,

I/O: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT-VIII: PROTECTION AND SECURITY

Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights. Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, 7th edition, John Wiley.

REFERENCE BOOKS:

1. Stallings, *Operating Systems, Internals and Design Principles*, 5th edition, Pearson Education, 2006.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd edition, PHI, 2007.
3. Deitel & Deitel, *Operating systems*, 3rd edition, Pearson Education, 2008.
4. Crowley, *Operating systems Oriented Approach*, TMH, 1998.
5. Dhamdhere, *Operating systems*, 2nd edition, TMH, 2008.

II B.Tech. II Semester

10BT41201: DATA COMMUNICATIONS

L	T	P	C
4	1	-	4

UNIT-I: FUNDAMENTALS OF DATA COMMUNICATION

Data communication Network Architecture, Protocols and Standards, Standards Organizations for Data Communications, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Circuit Arrangements, Data communications Networks.

Signals, Noise, Modulation and Demodulation: Signal Analysis, Electrical Noise and Signal-to-Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud and M-ary Encoding, Digital Modulation.

UNIT-II: METALLIC CABLE TRANSMISSION MEDIA

Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves, Transmission Line Classifications, Metallic Transmission Line Types, Metallic Transmission Line Equivalent Circuit, Metallic Transmission Line Losses.

Optical Fiber Transmission Media: Advantages and Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, The Physics of Light, Velocity of Propagation, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Optical Fiber Comparison, Losses in Optical Fiber Cables.

UNIT-III: DIGITAL TRANSMISSION

Pulse Modulation, Pulse Code Modulation (PCM), Dynamic Range, Signal Voltage -to-Quantization Noise Voltage Ratio, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed.

Multiplexing and T Carriers: Time- Division Multiplexing, T1 Digital Carrier System, Digital Line Encoding, T Carrier systems, Statistical Time - Division Multiplexing, Frame Synchronization, Frequency-Division Multiplexing, Wavelength- Division Multiplexing.

UNIT-IV: WIRELESS COMMUNICATIONS SYSTEMS

Electromagnetic Polarization, Rays and Wave fronts, Electromagnetic Radiation, Spherical Wave front and the Inverse Square Law, wave Attenuation and Absorption, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, Free-Space Path Loss, Basics of Microwave Communications Systems and Satellite Communications Systems.

UNIT-V: TELEPHONE INSTRUMENTS AND SIGNALS

The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Call Progress Tones and Signals, Cordless Telephones, Caller ID, Electronic Telephones, Paging systems.

The Telephone Circuit: The Local Subscriber Loop, Telephone Message- Channel Noise and Noise Weighting, Units of Powers Measurement, Transmission Parameters and Private-Line Circuits, Crosstalk.

UNIT-VI: CELLULAR TELEPHONE CONCEPTS AND SYSTEMS

Mobile Telephone Service, Cellular Telephone, Interference, Cell Splitting, Sectoring, Segmentation, Dualization, Topology, Roaming and handoff, Network Components, First- Generation Analog Cellular Telephone, Personal Communications system, Second-Generation Cellular Telephone Systems.

UNIT-VII: DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS

Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.

UNIT-VIII: DATA COMMUNICATIONS EQUIPMENT

Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems- Compatible Voice- Band Modems, Voice- Band Modern Block Diagram, Voice- Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, ITU-T Voice- Band Modem Specifications, 56K Modems, Probability of Error and Bit Error Rate.

TEXT BOOK:

1. Wayne Tomasi, *Introduction to Data Communications and Networking,* 1st edition, Pearson Education, 2005.

REFERENCE BOOKS:

1. Behrouz A Forouzan, *Data Communications and Networking,* 4th edition, TMH, 2006.
2. Fred Halsall, *Data Communications, Computer Networks and Open Systems,* 4th edition, Pearson Education, 1996.

II B.Tech. II Semester

10BT60501: THEORY OF COMPUTATION

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO THEORY OF AUTOMATA

Strings, Alphabets, Language, Operations on sets, Definition of an automaton, Description of a Finite Automaton (FA), Transition systems, Properties of transition functions, Acceptability of a string by a finite automaton.

UNIT-II: FINITE AUTOMATA

Deterministic finite automata(DFA), Nondeterministic finite automata(NFA), The language of a DFA, The Language of an NFA,

NFA with ϵ-transitions, Equivalence between NFA with and without ϵ-transitions,

NFA to DFA conversion, Equivalence between two finite state machines, Finite automata with output-Mealy and Moore machines, Minimization of finite automata.

UNIT-III: REGULAR EXPRESSIONS

Regular expressions, Regular sets, Identity rules, Constructing finite automata for a given regular expressions, Conversion of finite automata to regular expressions, Pumping lemma for regular sets, Applications of pumping lemma, Closure properties of regular sets.

UNIT-IV: FORMAL LANGUAGES

Basic definitions and examples, Chomsky classification of languages, Languages and their relation, Languages and automata, Regular grammars- Right linear and Left linear grammars, Equivalence between regular linear grammar and FA.
Context Free Grammars: Definition of context free grammars(CFG), Leftmost and rightmost derivations, The language of a grammar, Sentential forms, Constructing parse trees, The yield of a parse tree, Ambiguous grammars, Removing ambiguity from grammars.

UNIT-V: CONTEXT FREE LANGUAGES

Simplification of CFG, Eliminating useless symbols, Elimination of NULL productions, Elimination of unit productions, Chomsky Normal Form (CNF), Greibach Normal Form(GNF), Pumping lemma for context free languages(CFL).

UNIT-VI: PUSHDOWN AUTOMATA

Definition of pushdown automaton(PDA), The Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic pushdown automaton.

UNIT-VII: TURING MACHINES AND LINEAR BOUNDED AUTOMATA

Turing Machine model, Representation of Turing Machines(TM), Languages acceptability by Turing Machines, Design of Turing Machines, Computable functions, Recursively enumerable languages, Church's hypothesis, Counter machine, Types of Turing Machines, The model of linear bounded automaton(LBA), Turing Machines and type 0 grammar, Linear bounded automata and Languages.

UNIT-VIII: COMPUTABILITY THEORY

LR(k) grammar, Universal Turing Machines, Undecidable problems about Turing Machines, Post's Correspondence Problem, The Classes P and NP, An NP-Complete and NP-Hard Problems.

TEXT BOOK:

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, *Introduction to Automata Theory Languages and Computation,* 2nd edition, Pearson Education, 2005.

REFERENCE BOOKS:

1. K.L.P Mishra and N. Chandrashekaran, *Theory of Computer Science-Automata Languages and Computation,* 2nd edition, PHI, 2003.
2. John C Martin, *Introduction to Languages and the Theory of Computation,* 3rd edition, Tata McGraw Hill, 2003.
3. Daniel I.A. Cohen, *Introduction to Computer Theory,* 2nd edition, John Wiley, 2007.

II B.Tech. II Semester

10BT40521: **OPERATING SYSTEMS LAB**

L	T	P	C
-	-	3	2

1. Simulate the following CPU Scheduling algorithms and calculate waiting time, turn around time.
   a. First Come First Served (FCFS)
   b. Shortest Job First (SJF)
2. Simulate the following CPU Scheduling algorithms and calculate waiting time, turn around time.
   a. Round Robin
   b. Priority
3. Simulate the following Page Replacement algorithms and calculate the page faults.
   a. First in First Out (FIFO)
   b. Optimal
4. Simulate the following Page Replacement algorithms and calculate the page faults.
   a. Least Frequently Used (LFU)
   b. Least Recently Used (LRU)
5. Simulate the following Disk Scheduling algorithms and calculate total head movements
   a. First Come First Served (FCFS)
   b. Shortest Seek Time First (SSTF)
6. Simulate the following Disk Scheduling algorithms and calculate total head movements.
   a. SCAN
   b. Circular SCAN (CSCAN)
7. Simulate the following Disk Scheduling algorithms and calculate total head movements.
   a. LOOK
   b. Circular LOOK (CLOOK)

8. Implement Bankers Algorithm for Deadlock Avoidance.

9. Implement Bankers Algorithm for Deadlock Prevention

10. Implement the Bounded Buffer Producer - Consumer problem using Semaphores.

11. Implement the Infinite Buffer Producer - Consumer problem using Binary Semaphores.

12. Implement the Bounded Buffer Producer - Consumer problem using Monitors.

13. Implement the Dining Philosopher problem using Semaphores.

14. Simulate the following Disk Scheduling algorithms and calculate total head movements.

    a. Multiprogramming with a fixed number of tasks (MFT)

    b. Multiprogramming with a variable number of tasks (MVT)

II B.Tech. II Semester

10BT40511: OBJECT ORIENTED PROGRAMMING LAB

L	T	P	C
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1. a. Write a C++ program that prints Student Name, Roll No., Branch, Marks and display the Total and Division in the following format after reading the necessary input (Use \n \t etc..).

Name	::	********
Roll No	::	********
Branch	::	********
Marks	::	********
Total	::	********
Division	::	********

b. Write a C++ program to perform complex operations addition, Subtraction, Multiplication and Division using friend function.

2. a. Write a program in C++ to perform the following using the function template concepts.

i. To read a set of integers

ii. To read a set of floating point numbers

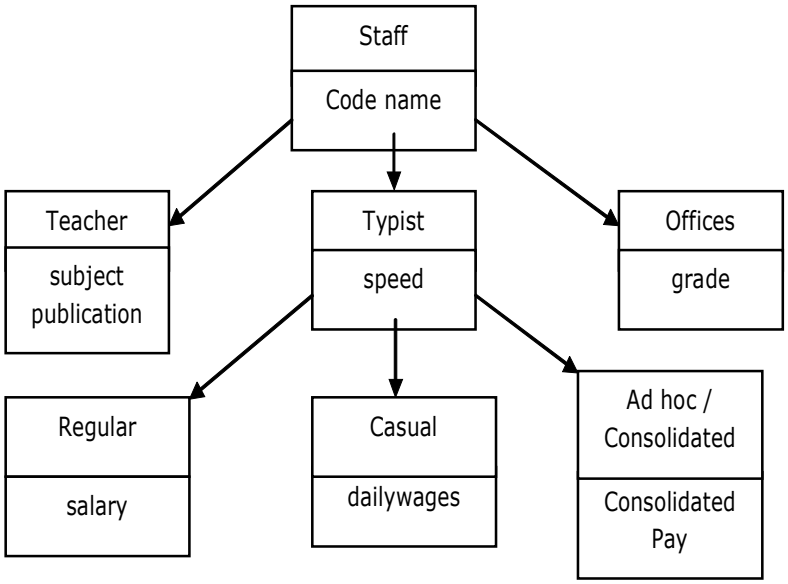
iii. To read a set of double numbers

Write function for finding average of non-negative numbers and also calculate the deviation of the numbers.

b. Write a class Fraction that defines methods addition, subtraction, multiplication and division of fractions by overloading basic arithmetic operators.

3. a. Write a C++ program to implement the given hierarchy, using the appropriate methods.

Class Relations



Salary- DA, HRA, PF, Dailywages - 200/- per day, Consolidated pay - Fixed Amount.

b. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get data() to initialize base class data members and another member function display area() to compute and display the area of figures. Make display area() as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively, and display the area.

Remember the two values given as input will be treated as length of two sides in the case of rectangles, and as base and height in the case of triangles, and used as follows:

Area of rectangle = x * y

Area of triangle = ½ * x * y

4. a. Create a class called Date that includes three pieces of information as instance variables-a month (type int), a day (type int). Your class should have a constructor that initializes the three values provided are correct.

Provide set and get method for each instance variable. Provide a method display date that displays the month, day, year separated by forward slashes (/).

Write a test application named DateTest that demonstrates Class Date's capabilities.

b. Create a class huge Integer which uses a 40-element array of digits to store integers as large as 40 digits each. Provide Methods: isEqualTo, isNotEqualTo, isGreaterThan, isLessThan, isGreaterThanorEqual and isLessThanorEqualTo.

Each method returns a boolean value if the relationship holds true.

5. a. Write a program that reads a line of integers (maximum limit 6 digits), and then displays each integers and sum of all the integers.

(Hint: Use StringTokenizer class)

b. Write a program to do the following

a) To print a question "Who is inventor of Java"?

b) To accept the answer

c) To print out "Good" and then stop, if the answer is correct.

d) To output the message "try again", if the answer is wrong.

e) To display the correct answer when the answer is wrong even at the third attempt and stop.

6. a. Assume that a bank maintains two kinds of account for its customers, one called saving account and the other current account. The savings account provides compound interest and with drawl facilities but no chequebook facility. The current account provides chequebook facility but no interest.

Current account holders should also maintain a minimum balance and if the balance falls below this level a service charge is imposed.

Create a class account that stores customer name, account number and type of account. From this derive the classes Curr_Acct and Sav_Acct to make them more specific to their requirements.

Include the necessary methods in order to achieve the following tasks:

a) Accept deposit from a customer and update the balance

b) Display the balance.

c) Compute and deposit interest.

d) Permit with drawl and update the balance.

e) Check for the minimum balance, impose penalty, if necessary and update the balance.

b. Write an inheritance hierarchy for classes Quadrilateral, Trapezoid, Parallelogram, Rectangle and Square. Use Quadrilateral as the super class of the hierarchy. Make the hierarchy as deep as possible. Specify the instance variables and methods for each class. The private instance variables of Quadrilateral. Write a program that instantiates objects of your classes and outputs the object's area (except Quadrilateral).

7. a. Write a program to illustrate an inner class by creating an anonymous object in the main class.

b. Design an interface 'Moveable Shape' that can be used as a generic mechanism for animating a shape. A movable shape must have two methods: move and draw. Write a 'Animation Panel' class that paints and moves any 'Moveable Shape' supply movable rectangle and car shapes.

8. a. Write a package called Math that implements class exactly java.lang.math, with a distinguished set of mathematical functions and also Date manipulation functions.

b. Implement Stack ADT using Packages.

9. a. Write a program that converts from 24-hour time to 12-hour time. Define an exception class IllegalTimeFormat, if the user enters an illegal time like 11:65 or even gibberish like &&* 68, throw and catch the exception.

b. Write a program that calls a method that throws an exception of type Arithmetic Exception at a random iteration in a for loop. Catch the Exception in the method and pass the iteration count when the exception occurred to the calling method by using an object of an exception class you define.

Add a finally block to the method to output the iteration count when the method exists.

10. a. Write a program that correctly implements producer-consumer problem using the concept of inter-thread communication.

    b. Write a program that demonstrates time slicing among equal priority threads, show that a lower priority thread's execution is deferred by the time slicing of higher-priority threads.

11. a. Develop an applet that displays a simple message.

    b. Develop an applet that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named "Compute" is clicked.

12. a. Write a Java program for handling Mouse Events.

    b. Write a Java program for handling Keyboard Events.

13. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

TEXT BOOKS:

1. W.Savitch, *Problem solving with C++, The OOP,* 4th edition, Pearson Education.
2. H.M.Dietel and P.J.Dietel, *Java How to Program,* 6th edition, Pearson Education/PHI.
3. Y.Daniel Liang, *Introduction to Java Programming,* 6th edition, Pearson Education.
4. Cay Horstmann, *Big Java,* 2nd edition, Wiley Student Edition, Wiley India Private Limited.

III B.Tech. I Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition, Nature and scope of managerial economics, Demand Analysis: Determinants of demand - Demand function - Law of demand and its exceptions, Elasticity of demand, Types, Measurement and significance of Elasticity of demand, Demand forecasting and methods of demand forecasting.

UNIT-II: THEORY OF PRODUCTION AND COST ANALYSIS

Production Function: isoquants and isocosts, Input - output relationship, law of returns, internal and external economies of scale, Cost Concepts: opportunity Vs out lay costs, Fixed Vs Variable costs, Explicit Vs implicit costs, out of pocket Vs inputted costs. Break Even Analysis (BEA), Determination of break even point, (Simple problems).

UNIT-III: INTRODUCTION TO MARKETS AND PRICING

Market Structure: Types of Markets, Features of Perfect competition, Monopoly and Monopolistic competition, Price and Output determination in Perfect competition and Monopoly. Pricing: Objectives and policies of Pricing - sealed bid pricing, Marginal cost pricing, cost plus pricing, going rate pricing, Limit Pricing, Market Penetration, Market Skimming, Block pricing, Bundling, Peak load pricing, Cross subsidization, Dual Pricing, Administrated Pricing.

UNIT-IV: BUSINESS AND NEW ECONOMIC ENVIRONMENT

Characteristic features of Business, features and evolution of Sole proprietorship, Partnership, Joint stock Company, New Economic policy 1991.

UNIT-V: INTRODUCTION AND PRINCIPLES OF ACCOUNTING

Accountancy: Introduction - Concepts - Conventions - Accounting Principles - Double entry Book Keeping, Journal, Ledger, Trail Balance, (Simple Problems).

UNIT-VI: FINAL ACCOUNTS

Introduction to final accounts, Trading Account, Profit and Loss Account, and Balance Sheet with Simple Adjustments, (Simple Problems).

UNIT-VII: CAPITAL AND CAPITAL BUDGETING

Capital: significance, Types of capital. Capital Budgeting: Nature and scope of capital budgeting. Features and Methods of capital budgeting. Pay Back Period Method, Accounting Rate of Return Method, Internal Rate of Return Method, Net present Value Method and Profitability Index (Simple Problems).

UNIT-VIII: COMPUTERIZATION OF ACCOUNTANCY SYSTEM

Manual Accounting Vs Computerized Accounting - Advantages and Disadvantages of Computerized Account - Using Accounting Software. Tally: Tally features - Company Creation - Account Groups - Group Creation - Ledger Creation.

TEXT BOOKS :

1. A.R. Aryasri, *Managerial Economics and Financial Analysis,* 3rd edition, Tata Mc-Graw Hill, New Delhi, 2007
2. R. Cauvery, U.K.Sudhanayak, M.Girija and R. Meenakshi, *Managerial economics,* 1st edition, S.Chand and company, New Delhi, 1997.

REFERENCE BOOKS:

1. Ms. Samba Lalita, *Computer Accounting Lab work,* 1st edition,, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19th edition, Sultan Chand and sons, New Delhi, 2005.
3. H.Craig Petersen and W.Cris Levis, *Managerial Economics,* 4th edition, Pearson 2009.
4. Lipsy and Chrystel, *Economics,* 4th edition , Oxford University Press, New Delhi, 2008.
5. S.N. Maheswari and S.K. Maheswari, *Financial Accounting,* 4th edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting,* 5th edition, Kalyani Publishers, Ludhiana, 2000.

III B.Tech. I Semester

10BT4EC01: OPTIMIZATION TECHNIQUES

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO OPTIMIZATION TECHNIQUES

Statement of an Optimization problem, design vector, design constraints, constraint surface, objective function, objective function surfaces, classification of Optimization problems.

UNIT-II: CLASSICAL OPTIMIZATION TECHNIQUES

Single variable Optimization, multi variable Optimization without constraints, necessary and sufficient conditions for minimum/ maximum, multivariable Optimization with equality constraints, Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn - Tucker conditions.

UNIT-III: INTRODUCTION TO LINEAR PROGRAMMING

Standard form of a linear programming problem, geometry of linear programming problems, definitions and theorems, solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations, motivation to the simplex method, simplex algorithm, big M-method, dual simplex algorithm.

UNIT-IV: TRANSPORTATION PROBLEM AND CONVEX PROGRAMMING

Finding initial basic feasible solution by North-West corner rule, least cost method and Vogel's approximation method, Assignment problems, variants, Integer Programming, Branch and bound technique, Convex programming.

UNIT-V: UNCONSTRAINED NONLINEAR PROGRAMMING

One-dimensional minimization methods: Classification, Fibonacci method, Problems and Quadratic interpolation method, Problems.

UNIT-VI: UNCONSTRAINED OPTIMIZATION TECHNIQUES

Univariate method, Problems, Powell's Method, Conjugate directions, Algorithms, Problems, Steepest Descent (Cauchy) Method, Problems.

UNIT-VII: CONSTRAINED NONLINEAR PROGRAMMING

Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods.

UNIT-VIII: DYNAMIC PROGRAMMING

Dynamic programming multistage decision processes, types, concept of sub optimization and the principle of optimality, computational procedure in dynamic programming, examples illustrating the calculus method of solution, examples illustrating the tabular method of solution.

TEXT BOOKS:

1. S. S. Rao, *Engineering optimization: Theory and practice*, 3rd edition, New Age International (P) Limited, 1998.
2. Dr. S.D. Sharma, *Operations Research*, Kedarnath Ram Nath and Co. Publications, Meerut, 2003.

REFERENCE BOOKS:

1. H.A. Taha, *Operations Research: An Introduction*, 6th edition, PHI Pvt. Ltd.
2. Kanthi Swaroop, Gupta and Mohan, *Introduction to Operations Research,* 2006.

III B.Tech. I Semester

10BT50502: **MICROPROCESSORS AND INTERFACING**

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

An overview of 8085, Architecture of 8086 microprocessor, Register organization, 8086 flag register and functions of 8086 flags, Addressing modes of 8086, Instruction set of 8086, Assembler directives, Procedures and Macros.

UNIT-II: ASSEMBLY LANGUAGE PROGRAMMING

Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III: ARCHITECTURE OF 8086 AND INTERFACING

Pin configuration of 8086-Minimum mode and maximum mode of operation, Timing diagram, Memory interfacing to 8086 (static RAM and EPROM), Need of Direct Memory Access (DMA), DMA data transfer method, Interfacing with 8237/8257.

UNIT-IV: PROGRAMMABLE INTERFACING DEVICES

8255 PPI-various modes of operation and interfacing to 8086.Interfacing keyboard, displays, 8279, stepper motor and actuators. D/A and A/D converter interfacing.

UNIT-V: INTERRUPTS AND PROGRAMMABLE INTERRUPT CONTROLLERS

Interrupt structure of 8086, Interrupt Vector table, Interrupt service routines, Introduction to DOS and BIOS interrupts, 8259 PIC architecture and interfacing cascading of interrupt controller and its importance, Programming with 8259.

UNIT-VI: SERIAL DATA TRANSFER SCHEMES

Asynchronous and synchronous data transfer schemes, 8251 USART architecture and interfacing, TTL to RS232C and RS232C to TTL converson, Sample programs for serial data transfer, introduction to high - speed serial communications standards, USB.

UNIT-VII: ADVANCED MICROPROCESSORS

Introduction to 80286, Salient Features of 80386, Real and Protected Mode, Segmentation and Paging, Salient Features of Pentium, Branch Prediction, Overview of RISC Processors.

UNIT-VIII: 8051 MICROCONTROLLER AND ITS PROGRAMMING

Architecture of micro controller - 8051 Microcontroller - internal and external memories -counters and timers - synchronous serial-cum asynchronous serial communication-interrupts.

Addressing modes of 8051, Instruction set of 8051, Assembly Language Programming examples using 8051.

TEXT BOOKS:

1. A.K. Ray and K.M.Bhurchandi, *Advanced microprocessor and peripherals,* 2nd edition, Tata Mc-Graw Hill Edition, 2000.

2. Kenneth J. Ayala, *The 8051 Microcontroller architecture, programming and applications,* 2nd edition, Pearson.

REFERENCE BOOKS:

1. Douglas V.Hall, *Microprocessors Interfacing,* 2nd edition, 2007.

2. Walter A.Triebel, Avtar Singh, *The 8088 and 8086 Microprocessors,* 4th edition, PHI, 2003.

3. Liu and GA Gibson, *Micro computer system 8066/8088 family Architecture, programming and Design,* 2nd edition, PHI.

4. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems,* PHI, 2000.

5. Deshmukh, *Microcontrollers,* Tata Mc-Graw Hill Edition, 2004.

III B.Tech. I Semester

10BT50503: DATABASE MANAGEMENT SYSTEMS

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION

History of Database Systems, Introduction to DBMS, Database System Applications, Database Systems Versus File Systems, View of Data, Data Models, Database Languages- DDL & DML Commands and Examples of Basic SQL Queries, Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures.

UNIT II: DATABASE DESIGN

Introduction to Database Design and E-R Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the E-R Model, Conceptual Design with the E-R Model, Conceptual Design for Large Enterprises.

UNIT III: THE RELATIONAL MODEL

Introduction to the Relational Model, Integrity Constraints over relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER to Relational, Introduction to Views, Destroying/Altering Tables and Views.

Relational Algebra and Calculus: Preliminaries, Relational Algebra Operators, Relational Calculus – Tuple and Domain Relational Calculus, Expressive Power of Algebra and Calculus.

UNIT IV: SQL: QUERIES, CONSTRAINTS, TRIGGERS

Overview, The form of a Basic SQL Query, Union, Intersect and Except operators, Nested Queries, Aggregate Operators, Null values, Complex Integrity Constraints in SQL, Triggers and Active Databases, Designing Active Databases.(Chapter 5;Sections 5.1-5.9 including subtopics from Text book-1)

UNIT V: SCHEMA REFINEMENT AND NORMAL FORMS

Introduction to Schema Refinement, Functional Dependencies, Reasoning about FDs, Normal Forms – 1NF, 2NF, 3NF, BCNF, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies – 4NF, 5NF, DKNF, Case Studies.

UNIT VI: TRANSACTIONS MANAGEMENT

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability.

UNIT VII: CONCURRENCY CONTROL AND RECOVERY SYSTEM.

Concurrency Control: Lock Based protocols, Time-Stamp Based Protocols, Validation based Protocols, Multiple Granularity, and Deadlock Handling.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Non-volatile Storage, Advanced Recovery Techniques, Remote Backup Systems.

UNIT VIII: OVERVIEW OF STORAGE AND INDEXING

Data on External Storage, File Organizations and Indexing, Index Data Structures, Comparison of File Organizations, Indexes and Performance Tuning.

Tree-Structured Indexing: Intuition for Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Tree Structure.

TEXT BOOK:

1. Raghurama Krishnan, Johannes Gehrke, *Database Management Systems*, 3 ed, Tata McGrawHill, 2007.
2. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, *Database System Concepts,* 5 ed, McGraw-Hill, 2005.

REFERENCE BOOKS:

1. Elmasri Navate, *Fundamentals of Database Systems*, Pearson Education,1994.
2. Peter Rob and Carlos Coronel, *Database Systems Design, Implementation and Management*, 7 ed, 2009.
3. Pranab Kumar Das Gupta, *Database Management System Oracle SQL and PL/SQL*, PHI Learning Private Limited, 2009.

III B.Tech. I Semester

10BT51201: SOFTWARE ENGINEERING

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO SOFTWARE ENGINEERING

The evolving role of software, Changing Nature of Software, Software myths.

A Generic View of Process: Software engineering - A layered technology, a process framework, Process patterns, process assessment, personal and team process models.

UNIT-II: PROCESS MODELS

The Waterfall model, Incremental model, RAD model, Prototyping, Spiral model, Concurrent Development model, The Unified process, Agile process models.

Software Requirements: Functional and Non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT-III: REQUIREMENTS ENGINEERING PROCESSES

Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System Models: Context models, Behavioral models, Data models, Object models, Structured methods.

UNIT-IV: DESIGN ENGINEERING

Design process and Design quality, Design concepts, the design model.

Creating an Architectural Design: Software Architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT-V: USER INTERFACE DESIGN AND RE-ENGINEERING

Performing User Interface Design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

Re-Engineering: Reverse Engineering, Restructuring, Forward Engineering.

UNIT-VI: SOFTWARE TESTING

A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, System testing, the art of Debugging.

UNIT-VII: SOFTWARE METRICS

Product Metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Size Oriented Metrics, Function-Oriented Metrics, Reconciling LOC and FP Metrics, Object-Oriented Metrics, Use-Case Oriented Metrics, Web Engineering Project Metrics, Metrics for Software Quality.

UNIT-VIII: RISK AND QUALITY MANAGEMENT

Risk Management: Reactive vs. Proactive Risk strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement, Risk Mitigation Monitoring and Management (RMMM), RMMM Plan.

Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Statistical Software Quality Assurance, Software Reliability, The ISO 9000 Quality Standards, The Capability Maturity Model Integration (CMMI).

TEXT BOOKS:

1. Roger S. Pressman, Software Engineering, A practitioner's Approach, 6th edition, McGrawHill International Edition, 2005.
2. Sommerville, Software Engineering, 7th edition, Pearson Education, 2006.

REFERENCE BOOKS:

1. K.K. Agarwal & Yogesh Singh, Software Engineering, 3rd edition, New Age International Publishers, 2007.
2. James F. Peters, Witold Pedrycz, John Wiely, Software Engineering, an Engineering approach, 2000.
3. Shely Cashman Rosenblatt, Systems Analysis and Design, 6th edition, Thomson Publications, 2006.

III B.Tech. I Semester

10BT51202: COMPUTER GRAPHICS

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO COMPUTER GRAPHICS

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

UNIT-II: OUTPUT PRIMITIVES

Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-III: 2-D GEOMETRICAL TRANSFORMS

Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT-IV: 2-D VIEWING

The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland - Hodgeman polygon clipping algorithm.

UNIT-V: 3-D OBJECT REPRESENTATION

Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT-VI: 3-D GEOMETRIC TRANSFORMATIONS

Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT-VII: VISIBLE SURFACE DETECTION METHODS

Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

UNIT-VIII: COMPUTER ANIMATION

Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

Image Manipulation and Storage: Digital image file formats, Image compression standard - JPEG.

TEXT BOOKS :

1. Donald Hearn and M.Pauline Baker, *Computer Graphics C version,* Pearson Education, 2006.
2. Foley, VanDam, Feiner and Hughes, *Computer Graphics Principles and practice in C,* Pearson Education, 2nd edition, 1996.

REFERENCE BOOKS:

1. Steven Harrington, *Computer Graphics,* TMH, 1982.
2. Neuman and Sproul, *Principles of Interactive Computer Graphics,* TMH, 2005.
3. David F Rogers, *Procedural elements for Computer Graphics,* 2nd edition, Tata Mc-Graw hill, 2001
4. Zhigand xiang, Roy Plastock, Schaum's outlines, *Computer Graphics,* 2nd edition, Tata Mc-Graw hill edition, 2004.

III B.Tech. I Semester

10BT50511: MICROPROCESSORS AND INTERFACING LAB

L	T	P	C
-	-	3	2

I. MICROPROCESSOR 8086:

1. Introduction to MDS
2. Arithmetic operation - Multi byte Addition and Subtraction, Multiplication and Division - Signed and unsigned Arithmetic operation, ASCII - arithmetic operation.
3. Logic operations - Shift and rotate - Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) - Display characters, Strings.

II. INTERFACING:

1. 8259 - Interrupt Controller: Generate an interrupt using 8259.
2. 8279 - Keyboard Display: Write a small program to display a string of characters.
3. 8255 - PPI: Interfacing DAC, Stepper Motor, ADC.
4. 8251 - USART: Write a program in ALP to establish Communication between two processors.

III. MICROCONTROLLER 8051:

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

III B.Tech. I Semester

10BT50512:DATABASE MANAGEMENT SYSTEMS LAB

L	T	P	C
-	-	3	2

DESCRIPTION OF SALES DATABASE:

ABC is a company operating in the country with a chain of shopping centers in various cities. Everyday large numbers of items are sold in different shopping centers. The Sales database comprises of various tables like CUST, PROD, SALES_DETAIL, STATE_NAME with the following schemas.

CUST TABLE

Name	Type	Remark
CID	VARCHAR2(6)	PRIMARY KEY
CNAME	VARCHAR2(10)	
CCITY	VARCHAR2(8)	

PROD TABLE

Name	Type	Remark
PID	VARCHAR2(6)	PRIMARY KEY
PNAME	VARCHAR2(6)	
PCOST	NUMBER(4,2)	
PROFIT	NUMBER(3)	

SALES DETAIL

Name	Type	Remark
CID	VARCHAR2(6)	COMPOSITE PRIMARY KEY
PID	VARCHAR2(6)	COMPOSITE PRIMARY KEY
SALE	NUMBER(3)	
SALEDT	DATE	COMPOSITE PRIMARY KEY

STATE NAME

Name	Type	Remark
CCITY	VARCHAR2(8)	PRIMARY KEY
STATE	VARCHAR2(15)	

1. ER Model

Draw an ER Model indicating many to many relationship between CUST vs PROD. Show the Cardinality Ratio between PROD and SALES_DETAIL is one-to-many because one product can be sold multiple times. Similarly show the Cardinality Ratio between CUST and SALES_DETAIL is one-to-many because one customer can purchase many products. Indicate CID# and PID# are unique in CUST and PROD entity respectively, where as CID and PID in SALE_DETAIL entity may occur many times.

Represent the ER Model in Tabular Form.

2. Normalization

In the above relations the following Functional Dependencies exist:

CID → CNAME, CCITY, STATE

PID → PNAME, PCOST, PPROFIT

CID, PID, SALEDT → SALE

CID#	CNAME	CCITY	STATE	PID#	PNAME	PCOST	PROFIT	SALE	SALEDT#
C1	RAVI	HYD	AP	P1	CD	10		5	14-JUL-10
				P3	DVD	20	10	2	14-JUL-10
				P3	DVD	20	10	3	20-AUG-09

Normalize the above table into 1NF, 2NF and 3NF. And handle Insert, Delete and Update anamolies.

3. Data Retrieval

a) Write a query to display all columns of CUST table.
b) Write a query to display pname of all records. Sort all records by pname. (use order by clause)
c) Write a query to display cname and ccity of all records. Sort by ccity in descending order.
d) Write a query to display cname, ccity who lives in mysore.
e) Write a query to display cname, pname, sale, saledt for all customers.
f) Write a query to display cname who have purchased Pen.
g) Write a query to display saledt and total sale on the date labeled as sale of all items sold after 01-sep-2010.

h) Write a query to display saledt and total sale on the date labeled as sale of all items other than DVD.
i) Write a query to display cname and ccity of all customers who live in Kolkata or Chennai.

4. Use of Distinct, Between, In clause, Like operator, Dual

a) Write a query to display the pname and pcost of all the customers where pcost lies between 5 and 25.
b) Find the product ids in sale_detail table(eliminating duplicates).
c) Write a query to display distinct customer id where product id is p3 or sale date is '18-mar-2011'.
d) Write a query to display cname, pid and saledt of those customers whose cid is in c1 or c2 or c4 or c5.
e) Write a query to display cname, pid, saledt of those customers whose pid is p3 or sale date is '20-dec-2009'.
f) Write a query to display system date.
g) Write a query to display all records of prod table in which first and third character of pname is any character and second character is 'E'.
h) Write a query to display all cname which includes two 'A' in the name.

5. Constraints

a) Implement table level and Column level constraints like NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK.

6. Single Row Functions: DATE Function

a) Write a query to display the system date by rounding it to next month.
b) Write a query to display the system date by rounding it to next year.
c) Write a query to display the last date of the system date.
d) Write a query to display the next date of system date which is Friday.
e) Write a query to display sale date and date after 02 months from sale date.

f) Write a query to display system date, sale date and months between two dates.
g) Write a query to display the greatest date between sale date and system date, name it as BIG, also display sale date and SYSDATE.
h) Write a query to display the least date between sale date and system date name it as SMALL, also display sale date and SYSDATE.

7. Single Row Functions: Numeric and Character Function

a) Write a query to display the product name along with the rounded value of product cost for product name is "Pencil".
b) Write a query to display product cost along with MOD value if divided by 5.
c) Write a query to display cname in uppercase, lowercase, titlecase from cust table where customer name is "rohan".
d) Write a query to display all concatenated value of cname, ccity by converting cname into titlecase and ccity into uppercase.
e) Write a query to display the first 3 characters of cname.
f) Write a query to display the position of 'M' in the cname of the customer whose name is "SAMHITA".
g) Write a query to display the length of all customer names.
h) PAD # character in left of product cost to a total width of 5 character position.

8. Group Functions and SET Functions

a) Write a query to display the total count of customer.
b) Write a query to display the minimum cost of product.
c) Write a query to display average value of product cost rounded to 2nd decimal places.
d) Write a query to display product name with total sale detail in descending order.
e) Write a query to display product name, sale date and total amount collected for the product.
f) Write a query to display sale date and total sale date wise which was sold after "14-jul-08".

g) Write a query to display the customer name who belongs to those places whose name is having I or P.
h) Write a query to display customer name who belongs to a city whose name contains characters 'C' and whose name contains character 'A'.
i) Write a query to display the customer name who does not belong to PUNE.

9. PL/SQL

a) Write a PL/SQL program to find largest number among three. (Hint: Use Conditional Statement)
b) Write a PL/SQL program to display the sum of numbers from 1 to N using for loop, loop…end and while…loop.

10. SQL Cursor

a) Write a PL/SQL program to display the costliest and cheapest product in PROD table.
b) Write a PL/SQL program which will accept PID and display PID and its total sale value i.e. sum.

11. Functions

a) Write a function that accepts two numbers A and B and performs the following operations.
    i. Addition
    ii. Subtraction
    iii. Multiplication
    iv. Division
b) Write a function that accepts to find the maximum PCOST in PROD table.

12. Procedures

a) Write a procedure that accepts two numbers A and B, add them and print.
b) Write procedures to demonstrate IN, IN OUT and OUT parameter.

13. Trigger

a) Develop a PL/SQL program using BEFORE and AFTER triggers.

14. Cursor

a) Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

III B.Tech. I Semester

10BT4HS02: ADVANCED ENGLISH COMMUNICATION SKILLS (AUDIT COURSE)

L	T	P	C
-	3	-	-

UNIT-I: VOCABULARY BUILDING:

Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.

Functional English: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT-II: READING COMPREHENSION

Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

UNIT-III: ACADEMIC ESSAY WRITING

Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

UNIT-IV: TECHNICAL REPORT WRITING

Types of formats and styles, Subject-matter, Subject- organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

UNIT-V: CAREER SKILLS

Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.

UNIT-VI: RESUME WRITING

Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

UNIT-VII: GROUP DISCUSSION

Dynamics of group discussion, Intervention, Summarizing, and Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

UNIT-VIII: INTERVIEW SKILLS

Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

TEXT BOOKS:

1. M. Ashraf Rizvi, *Effective Technical Communication Skills*, Tata McGraw Hill, New Delhi, 2005.

2. Meenakshi Raman and Sangetha Sharma, *Technical Communication, Principles and Practice*, Oxford University Press, New Delhi, 2010.

3. Santha Kumar R, *Secrets of Success in Interviews,* Crucial Books, Secunderabad, 2007.

4. M. Ashraf Rizvi, *Resumes and Interviews - The Art of Wining,* Tata Mc Graw Hill, New Delhi, 2008.

5. Gopala Swamy Ramesh and Mahadevan Ramesh, *The Ace of Soft Skills: Attitude, Communication and Etiquette for Success,* Pearson Education, New Delhi, 2009.

SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.

III B.Tech. II Semester

10BT70501: PRINCIPLES OF COMPILER DESIGN

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UNIT-I: INTRODUCTION TO COMPILERS

Definition of compiler, interpreter and its differences, The phases of a compiler, Role of lexical analyzer, Regular expressions, Finite automata, From regular expressions to finite automata, Pass and phases of translation, bootstrapping, LEX-lexical analyzer generator.

UNIT-II: PARSING

Parsing, Role of parser, Context free grammar, Derivations, Parse trees, Ambiguity, Elimination of left recursion, Left factoring, Eliminating ambiguity from dangling-else grammar, Classes of parsing, Top-down parsing- Backtracking, Recursive-descent parsing, Predictive parsers, LL(1) grammars.

UNIT-III: BOTTOM-UP PARSING

Definition of bottom-up parsing, Handles, Handle pruning, Stack implementation of Shift-Reduce parsing, Conflicts during Shift-Reduce parsing, LR grammars, LR parsers-Simple LR, Canonical LR and Look Ahead LR parsers, Error recovery in parsing, Parsing ambiguous grammars, YACC-automatic parser generator.

UNIT-IV: SYNTAX-DIRECTED TRANSLATION

Syntax directed definition, Construction of syntax trees, S-attributed and L-attributed definitions, Translation schemes, Emitting a Translation.

Intermediate Code Generation: Intermediate forms of source programs- Abstract syntax tree, Polish notation and Three address code, Types of three address statements and its implementation, Syntax directed translation into three-address code, Translation of simple statements, Boolean expressions and flow-of-control statements.

UNIT-V: TYPE CHECKING

Definition of type checking, Type expressions, Type systems, Static and dynamic checking of types, Specification of a simple type checker, Equivalence of type expressions, Type conversions, Overloading of functions and operators.

UNIT-VI: RUN TIME ENVIRONMENTS

Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing, Symbol tables, Language facilities for dynamic storage allocation.

UNIT-VII: CODE OPTIMIZATION

Organization of code optimizer, Basic blocks and flow graphs, Optimization of basic blocks, The principal sources of optimization, The DAG representation of basic block, Global data flow analysis.

UNIT-VIII: CODE GENERATION

Machine dependent code generation, Object code forms, The target machine, A simple code generator, Register allocation and assignment, Peephole optimization.

TEXT BOOK:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, *Compilers-Principles, Techniques and Tools,* Pearson Education, 2004.

REFERENCE BOOKS:

1. Alfred V. Aho, Jeffrey D. Ullman, *Principles of compiler design,* Pearson Education, 2001.
2. Kenneth C. Louden, *Compiler Construction- Principles and Practice,* Thomson, 1997.
3. K.L.P Mishra and N. Chandrashekaran, *Theory of computer science- Automata Languages and computation,* 2nd edition, PHI, 2003.
4. Andrew W. Appel, *Modern Compiler Implementation C,* Cambridge University Press, 2004.

III B.Tech. II Semester

10BT60502: UNIX PROGRAMMING

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UNIT-I: INTRODUCTION TO UNIX AND UNIX UTILITIES

A Brief history of Unix, Architecture of Unix, Features of Unix, Introduction to vi editor. General Purpose Utilities, File Handling Utilities, Security by File Permissions, Process Utilities, Disk Utilities, Networking Commands, detailed commands to be covered are passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

UNIT-II: TEXT PROCESSING AND BACKUP UTILITIES

Text Processing Utilities and Backup Utilities , detailed commands to be covered are cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT-III: WORKING WITH THE BOURNE AGAIN SHELL (BASH)

Shell, Shell Responsibilities, Types of Shell, Pipes and I/O Redirection, Shell as a Programming Language, Shell Syntax: Variables, Conditions, Control Structures, Commands, Command Execution, Here Documents, and Debugging Scripts.

UNIT-IV: UNIX FILE STRUCTURE

Introduction to Unix File System, Inode (Index Node), File Descriptors, System Calls and Device Drivers, Library Functions.

Low Level File Access: open, read, write, close, lseek, stat, fstat, lstat, ioctl, umask, dup and dup2.

The Standard I/O Library: fopen, fread, fwrite, fclose, fflush, fseek, fgetc, fputc, fgets.

Formatted Input and Output: printf, fprintf, sprint, scanf, fscanf, and sscanf.

File and Directory Maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd, Scanning Directories: opendir, readdir, telldir, seekdir, closedir.

UNIT-V: PROCESS AND SIGNALS

Process, Process Identifiers, Process Structure: Process Table, Viewing Processes, System Processes, Process Scheduling, Starting New Processes: Waiting for a Process, Zombie Processes, fork, vfork, exit, wait, waitpid, exec, Signals functions, Unreliable Signals, Interrupted System Calls, kill, raise, alarm, pause, abort, system, sleep Functions, Signal Sets.

UNIT-VI: DATA MANAGEMENT AND FILE LOCKING

Data Management: Managing Memory: malloc, free, realloc, calloc, File Locking: Creating Lock Files, Locking Regions, Use of Read and Write with Locking, Competing Locks, Other Lock Commands-Advisory Locking,Mandatory Locking;Deadlocks.

UNIT- VII: INTER-PROCESS COMMUNICATION

Pipe, Process Pipes, The Pipe Call, Parent and Child Processes, Named Pipes: FIFOs, Semaphores: semget, semop, semctl, Message Queues: msgget, msgsnd, msgrcv, msgctl, Shared Memory: shmget, shmat, shmdt, shmctl, IPC Status Commands.

UNIT-VIII: INTRODUCTION TO SOCKETS

Socket, Socket Connections - Socket Attributes, Socket Addresses, socket, connect, bind, listen, accept, Socket Communications.

TEXT BOOK:

1. W. Richard. Stevens, *Advanced Programming in the UNIX Environment*, 1 ed, Pearson Education, 2005.

REFERENCE BOOKS:

1. Sumitabha Das, *Your Unix The Ultimate Guide*, TMH, 2007.
2. Neil Matthew, *Richard Stones, Beginning Linux Programming*, 3 ed, Wiley Dreamtech India (P) Ltd.
3. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, *UNIX Network Programming - The Sockets Networking API*, 3 ed, Volume 1, PHI Learning Private Limited.

III B.Tech. II Semester

10BT60503: DATA WAREHOUSING AND DATA MINING

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UNIT-I: DATA WAREHOUSE AND OLAP TECHNOLOGY

Data Warehouses – Definitions – Multidimensional Data Model – Data Warehouse Architecture.(Chapter 3;Sections 3.1-3.3 including sub topics of the Text book)

UNIT-II: INTRODUCTION TO DATA MINING

Definition of Data Mining – Kinds of Data – Data Mining Functionalities– Classification of Data Mining Systems – Primitives – Major Issues in Data Mining.

UNIT-III: DATA PREPROCESSING

Descriptive Data Summarization- Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.

UNIT-IV: MINING FREQUENT PATTERNS AND ASSOCIATIONS

Basic Concepts – Efficient and Scalable Frequent Itemset Mining Methods – Association Rule Mining.(Chapter 5;Sections 5.1-5.5 including subtopics of Text book)

UNIT-V: CLASSIFICATION

Decision Tree Induction, Bayesian Classification – Rule Based Classification, Prediction – Accuracy and Error Measures.

UNIT-VI: CLUSTER ANALYSIS

Cluster Analysis – Categories of Clustering Methods – Partitioning Methods – Hierarchical Methods – Density based Methods – Grid based methods – Model Based Clustering methods – Clustering High Dimensional Data – CLIQUE.

UNIT-VII: MINING STREAM, TIME SERIES AND SEQUENCE DATA

Mining data streams, Mining Time Series Data, Mining Sequence Patterns in Biological Data.

UNIT-VIII: MINING OBJECT, SPATIAL, MULTIMEDIA, TEXT AND WEB

Multi Dimensional Analysis on Complex Object data types – Descriptive Mining on Complex Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Web Mining.

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, *Data Mining: Concepts and Techniques*, 2 ed, Elsevier, 2008.

REFERENCE BOOKS:

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics*, 2 ed, Pearson Education, 2006.
2. Amitesh Sinha, *Data Warehousing*, Thomson Learning, 2007
3. Xingdong Wu, Vipin Kumar, *The Top Ten Algorithms in Data Mining*, Taylor and Francis Group, 2009.
4. Max Barmer, *Principles of Data Mining*, Springer, 2007

III B.Tech. II Semester

10BT61201: OBJECT ORIENTED ANALYSIS AND DESIGN

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO UML

Introduction to object oriented concepts like inheritance, polymorphism, information hiding, Importance of modeling, principles of modeling, object oriented modeling, An overview of UML, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT-II: BASIC STRUCTURAL MODELING

Classes-Terms and concepts, Common modeling techniques, Relationships-modeling simple dependencies, single Inheritance and structural relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, Instances.

UNIT-III: CLASS AND OBJECT DIAGRAMS

Terms, concepts, modeling techniques for Class Diagram-modeling Simple collaboration, Logical database Schema Forward and Reverse Engineering, Object Diagrams-Modeling object structures, Forward and reverse engineering.

UNIT-IV: BASIC BEHAVIORAL MODELING-I

Interactions-Terms and concepts, modeling a flow of control, Interaction diagrams-terms and concepts, modeling flows of control by time ordering and control by organization, Forward and reverse Engineering.

UNIT-V: BASIC BEHAVIORAL MODELING-II

Use cases-terms and concepts, modeling the behavior of the element, Usecase Diagrams-Terms and concepts, modeling the context of a system and requirement of a system, Forward and reverse Engineering, Activity Diagrams - Terms and concepts, modeling a workflow and an operation, Forward and reverse Engineering.

UNIT-VI: ADVANCED BEHAVIORAL MODELING

Events and signals-modeling a family of signals and exceptions, state machines-modeling the lifetime of an object, state machines, processes and Threads-modeling multiple flows of control and interprocess communication, time and space-modeling timing constraints, distribution of objects and objects that migrate, state chart diagrams-modeling reactive objects and Forward and reverse Engineering.

UNIT-VII: ARCHITECTURAL MODELING

Component-Terms and concepts, modeling executables and Libraries, modeling tables, file, and documents, modeling an API, modeling source code, Deployment-modeling processors and devices, modeling the distribution of components, Component diagrams-modeling source code, executable release, physical database, Adaptable Systems, Forward and reverse Engineering and Deployment diagrams-modeling an embedded systems, Client/ server System, Fully distributed systems, Forward and reverse Engineering.

UNIT-VIII: CASE STUDIES

Model all the views of: Automation of a Library, Point of Sales System.

TEXT BOOK:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, *The Unified Modeling Language User Guide,* 2nd edition, Pearson Education, 2009.

REFERENCE BOOKS:

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit,* WILEY-Dreamtech India Pvt. Ltd., 2006
2. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML,* Pearson Education,2000.
3. Pascal Roques, *Modeling Software Systems Using UML2,* WILEY-Dreamtech India Pvt. Ltd, 2004.
4. Craig Larman, *An introduction to Object - Oriented Analysis and Design and Unified Process Appling UML and Patterns,* Pearson Education, 2001.
5. John W. Satzinger, Robert B Jackson and Stephen D Burd, *Object-Oriented Analysis and Design with the Unified Process,* Cengage Learning, 2004.
6. R.C.Lee, and W.M.Tepfenhart, *UML and C++*, PHI, 2009.

III B.Tech. II Semester

10BT61202: **COMPUTER NETWORKS**

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UNIT-I: INTRODUCTION

Network Applications, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Example Networks: Novell Network, X.25, Internet.

UNIT-II: THE PHYSICAL LAYER

Theoretical Basis for communication, Guided Transmission media, Wireless Transmission, The public switched telephone Networks, Mobile telephone system.

UNIT-III: THE DATA LINK LAYER

Design Issues, Error detection and correction-CRC, Hamming codes, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols: HDLC, The Data Link Layer in the Internet.

UNIT-IV: THE MEDIUM ACCESS SUBLAYER

Channel Allocation problem, Multiple Access protocols: ALOHA, CSMA, CSMA/CD protocols, Collision free protocol, Limited contention protocol, Ethernet, DLL Switching.

UNIT-V: THE NETWORK LAYER

Network Layer Design Issues, Routing Algorithms: Shortest path, Flooding, Distance vector, Hierarchical, Broadcast and Multicast, Congestion Control Algorithms, Internetworking, The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, Ipv6 Main Header.

UNIT-VI: THE TRANSPORT LAYER

Transport Service, Elements of transport protocol, Internet Transport layer protocols: UDP and TCP.

UNIT-VII: THE APPLICATION LAYER

DNS: The Domain name system, Electronic Mail, World Wide Web: Architectural Overview, Dynamic Web Document, HTTP.

UNIT-VIII: IEEE STANDARDS AND NETWORK SECURITY

Introduction to IEEE standards, Wi-Fi: 802.11b, Bluetooth: 802.15, 3G: 802.16, 4G: 802.16m, Wi-Max: 802.16a.

Introduction to Network Security: Cryptography - Substitution Techniques, Transposition Techniques.

TEXT BOOK:

1. A.S. Tanenbaum, *Computer Networks*, 4th edition, Pearson Education/PHI.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, *Data communication and Networking*, Tata McGraw-Hill, 2004
2. Peterson and Davie, *Computer Networks*, 2nd edition, Morgan Kaufmann.
3. Kurose, Ross, *Computer Networking*, Pearson Education, 2010.
4. Leon-Garcia and Widjaja, *Communication Networks,* 2nd edition TMH.
5. S.Keshay, *An Engg. Approach to Computer Networking*, Addison Wesley, 1997.

III B.Tech. II Semester

10BT50501: DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	C
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UNIT-I: INTRODUCTION

Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation-Big O notation, Omega notation, Theta notation and Little O notation, Recurrences, Probabilistic analysis.

UNIT-II: DISJOINT SETS AND GRAPHS (Algorithm and analysis)

Disjoint set operations, union and find algorithms, Graphs-Breadth First search and Traversal, Depth First Search and Traversal, spanning trees, connected components and biconnected components.

UNIT-III: DIVIDE AND CONQUER

General method, Applications-Analysis of Binary search, Quick sort, Merge sort, Strassen's matrix multiplication, Finding the Maxima and Minima.

UNIT-IV: GREEDY METHOD

General method, Applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem, Optimal storage on Tapes.

UNIT-V: DYNAMIC PROGRAMMING

General method, Applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design, String Editing.

UNIT-VI: BACKTRACKING

General method, applications-n-queen problem, sum of subsets problem, graph colouring, 0/1 knapsack problem, Hamiltonian cycles.

UNIT-VII: BRANCH AND BOUND

General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT-VIII: NP-HARD AND NP-COMPLETE PROBLEMS

Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem, NP-hard scheduling Problems.

TEXT BOOK:

1. Ellis Horowitz, Sartaj Sahni and Rajasekharam, *Fundamentals of Computer Algorithms*, 2nd edition, Galgotia publications Pvt. Ltd.

REFERENCE BOOKS:

1. M.T.Goodrich and R. Tomassia, *Algorithm Design: Foundations, Analysis and Internet examples*, John Wiley and sons, 2002.
2. R.C.T.Lee, S.S. Tseng, R.C. Chang and T. Tsai, *Introduction to Design and Analysis of Algorithms A strategic approach*, McGraw Hill, 2006.
3. Allen Weiss, *Data structures and Algorithm Analysis in C++*, 2nd edition, Pearson Education.
4. Aho, Ullman and Hopcroft, *Design and Analysis of algorithms*, 2nd edition, Pearson Education.

III B.Tech. II Semester

10BT61211: OBJECT ORIENTED ANALYSIS AND DESIGN LAB

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Case studies given below should be Modeled using Rational Rose tool in different views i.e Use case view, logical view, component view and Deployment view.

CASE STUDY 1: LIBRARY INFORMATION SYSTEM

Problem Statement:

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned by the library that person is notified. The library can easily create, update and delete information about the titles, members, loans and reservations in the systems.

CASE STUDY 2: A POINT OF SALE (POS) SYSTEM

Problem Statement:

A POS System is a computerized application used to record sales and handle payments; it is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third-party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services and temporarily unavailable they must still be of capturing sales and handling at least cash payments. A POS system must support multiple and varied client - side terminals and interfaces such as browser, PDA s, touch - screens.

CASE STUDY 3: AUTOMATED TELLER MACHINE (ATM)

Problem Statement:

Software is designed for supporting a computerized ATM banking network. All the process involved in the bank is computerized these days.

All the accounts maintained in the bank and also the transactions effected, including ATM transactions are to be processed by the computers in the bank. An ATM accepts a relevant cash card, interacts with user, communicates with the central system to carry out the transaction, dispenses cash, and prints receipts. The system

to be designed and implemented must include appropriate record keeping and security provisions. The system must handle concurrent access to the same account.

CASE STUDY 4: ONLINE TICKET RESERVATION FOR RAILWAYS

Problem Statement:

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, data of journey, destination, class of train etc.The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator.There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes ie Sleeper class, First class and the AC compartment.Design the application for the above problem description.

CASE STUDY 5: RECRUITMENT PROCEDURE FOR SOFTWARE INDUSTRY

Problem Statement:

In the software industry the recruitment procedure is the basic thing that goes in the hand with the requirement as specified by the technical management team. HR first gives an advertisement in leading Newspapers, Journals, Weeklies and Websites. The job seekers can apply for it through by Post or by e-mail to the company.

The technical skill and the experience of the candidates are reviewed and the sort listed candidates are called for the interview. There may be different rounds for interview like the written test technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidates names are displayed.

Mean while HR gives all the details about the salary, working hours, terms and conditions and the retirement benefit to the candidate.

CASE STUDY 6: DESIGN A STUDENT REGISTRATION SYSTEM

Problem Statement:

Each student has access to his or her course and grade information only and must be authenticated prior to viewing or updating the information. A course instructor will use the system to view the list of courses he or she is assigned for a given semester or has taught previously, view the list of students registered for the course(s) he or she is teaching, and record final grades for each student in the course(s). TA assignments will also be viewable through this system. Instructors must also be authenticated prior to viewing or updating any information.

CASE STUDY 7: PROBLEM TITLE: ONLINE AUCTION SALES

Problem Statement:

The online auction system is a design about a website where sellers collect and prepare a list of items they want to sell and place it on the website for visualizing. To accomplish this purpose the user has to access the site. Incase it's a new user he has to register. Purchaser's login and select items they want to buy and keep bidding for it. Interacting with the purchasers and sellers through messages does this. There is no need for customer to interact with the sellers because every time the purchasers bid, the details will be updated in the database. The purchaser making the highest bid for an item before the close of the auction is declared as the owner of the item. If the auctioneer or the purchaser doesn't want to bid for the product then there is fixed cutoff price mentioned for every product. He can pay that amount directly and own the product. The purchaser gets a confirmation of his purchase as an acknowledgement from the website. After the transition by going back to the main menu where he can view other items.

REFERENCES:

1. Grady Booch, James Rum Baugh, Ivar Jacobson, *The Unified Modeling Language User Guide,* 2nd Edition, Pearson Education, 2009.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit,* WILEY-Dreamtech India Pvt. Ltd, 2006.
3. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML,* Pearson Education, 2000.
4. Pascal Roques, *Modeling Software Systems Using UML2,* WILEY-Dreamtech India Pvt. Ltd, 2004.
5. Craig Larman, *An introduction to Object - Oriented Analysis and Design and Unified Process Appling UML and Patterns,* Pearson Education, 2001.

III B.Tech. II Semester

10BT61212: UNIX AND COMPUTER NETWORKS LAB

L	T	P	C
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1. Study and practice various commands like tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, unmask, ulimit, ps, who, w.
2. Study and practice various commands like cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff.
3. a. Write a Shell Script to print all .txt files and .c files.

   b. Write a Shell Script to move a set of files to a specify directory.

   c. Write a Shell Script to display all the users who are currently logged in after a specified time.

   d. Write a Shell Script to wish the user based on the login time.
4. a. Simulate head Command.

   b. Simulate cp Command.
5. a. Write a Program to handle the Signals like SIGINT, SIGQUIT, and SIGFPE.

   b. Write a Program to create a Zombie Process.

   c. Create a Process using fork() and display Child and Parent Process Id's.
6. a. Write a Program to Lock a File.

   b. Write a Program to accept a file and Change the Permissions for the file using chmod().
7. Implement the Following IPC Forms

   a. FIFO

   b. PIPE
8. Implement the following IPC Forms

   a. Message Queue

   b. Shared Memory
9. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.

10. Implement on a data set of characters the three CRC polynomials - CRC 12, CRC 16 and CRC CCIP.
11. Implement Dijkstra's algorithm to compute the Shortest path through a graph.
12. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm.
13. Take an example subnet of hosts. Obtain broadcast tree for it.

REFERENCES:

1. Sumitabha Das, *Your Unix The Ultimate Guide,* TMH, 2007.
2. W.R.Stevens, *Advanced Programming In The UNIX Environment,* 1st edition, Pearson Education.
3. Neil Matthew, Richard Stones, *Beginning Linux Programming,* 3rd edition, Wiley Dreamtech India (P) Ltd, 2005.

IV B.Tech. I Semester

10BT71201: **WEB PROGRAMMING**

L	T	P	C
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UNIT-I: INTRODUCTION TO HTML

Basic HTML, the document body, text, hyperlinks, lists, tables, images, frames, forms, Cascading Style Sheets: Introduction, simple examples, defining your own styles, properties and values in styles, formatting blocks of information, layers.

UNIT-II: JAVA SCRIPT

Basics, variables, string manipulation, arrays, functions, objects in java script, introduction to DHTML.

UNIT-III : EXTENSIBLE MARKUP LANGUAGE (XML)

XML basics, Document Type Definition, XML Schema, Presenting XML, Introduction to DOM and SAX parsers.

UNIT-IV: SERVLET PROGRAMMING

Introduction, servlet implementation, servlet configuration, servlet exceptions, servlet lifecycle, Requests and Responses: ServletRequest, ServletResponse, HttpServlet-Request, HttpServletResponse interfaces, cookies, session creation and tracking using HttpSession interface.

UNIT-V: DATABASE PROGRAMMING WITH JDBC

Database drivers, the java.sql package: connection management, database access, data types, database metadata, exceptions and warnings, loading a database driver and opening connections, establishing a connection, creating and executing sql statements querying the database, prepared statements, mapping sql types to java, transaction support, save points.

UNIT-VI: INTRODUCTION TO JSP

Introducing JSP, JSP directives, scripting elements, standard actions, implicit objects, scope and JSP pages as XML documents, introduction to MVC architecture.

UNIT-VII: JSP TAG EXTENSIONS

Introduction to javabean, advantages of javabean, introspection, getter and setter methods, introduction to JSP tag extensions, a simple tag, anatomy of a tag extension, writing tag extensions.

UNIT-VIII: JSP APPLICATIONS WITH TAG LIBRARIES

Benefits of using custom tag libraries, introducing the JSP Standard Tag Library (JSPTL), getting started with the JSPTL, integrating the JSPTL into your JSP page, the JSPTL tags.

TEXT BOOKS:

1. Chris Bates, *Web Programming Building Internet Applications,* 2nd edition, Wiley, 2007.

2. Subrahmanyam Allamaraju and Cedric Buest, *Professional Java Server Programming J2EE,* 1.3 edition, SPD (apress), 2004.

REFERENCE BOOKS:

1. Dietel and Dietel, *Internet and World Wide Web How to program*, 4th edition, PHI, 2008.
2. David Hunter, A. Watt and Jeff Rafter, *Beginning XML,* Wiley Dreamtech, 2004.
3. J. McGovern, Rahim Adatia and Yakov Fain, *J2EE 1.4 Bible,* Wiley Dreamtech, 2004.
4. Hans Bergsten, *Java Server Pages,* 3rd edition, SPD O'Reilly, 2010.

IV B.Tech. I Semester

10BT71202: **MOBILE COMPUTING**

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UNIT-I: MOBILE COMPUTING

Introduction, History, architecture, devices and applications, limitations.

GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT-II: MEDIUM ACCESS CONTROL

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT-III: WIRELESS LAN

Infrared vs. radio transmission, Infrastructure and ad hoc networks, IEEE 802.11.

HiperLAN: Protocol architecture, physical layer, Channel access control sub-layer, MAC sub-layer, Information bases and networking.

Bluetooth: User scenarios, physical layer, MAC layer, networking, security, link management.

UNIT-IV: MOBILE NETWORK AND TRANSPORT LAYERS

Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT-V: DATABASE ISSUES

Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT-VI: DATA DISSEMINATION

push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT-VII: MOBILE AD HOC NETWORKS (MANETS)

Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs

UNIT-VIII: PROTOCOLS AND TOOLS

Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers) and J2ME.

TEXT BOOKS:

1. Rajkamal, *Mobile Computing,* 2nd edition, OXFORD University Press, 2008.

2. Jochen Schiller, *Mobile Communications,* 2nd edition, Pearson Education, 2003.

REFERENCE BOOKS:

1. Stojmenovic and Cacute, *Handbook of Wireless Networks and Mobile Computing,* John Wiley, 2002.
2. Hansmann, Merk, Nicklous, Stober, *Principles of Mobile Computing,* 2nd edition, Springer, 2003.

IV B.Tech. I Semester

10BT71203: MULTIMEDIA AND APPLICATIONS DEVELOPMENT

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO MULTIMEDIA

Definition of multimedia, multimedia and hypermedia, World Wide Web, multimedia software tools, graphics and image data representations: graphics/image data types, file formats, color models in images, color models in video.

UNIT-II: FUNDAMENTAL CONCEPTS IN AUDIO AND VIDEO

Definition of sound, Digitization, Nyquist theorem, signal to noise ratio, signal to quantization-noise ratio, MIDI, types of video signals, analog video, digital video.

UNIT-III: ACTION SCRIPT-I

Action Script 2.0 Features, Data types and type cheching: static typing, type syntax, compatible types, casting, Action Script 2.0 type checking, Classes: defining classes, constructor functions, properties, methods.

UNIT-IV: ACTION SCRIPT-II

Inheritance: A primer on inheritance, subclasses as subtypes, overriding methods and properties, constructor functions in subclasses, polymorphism and dynamic binding, Interfaces: introduction, syntax and use, Packages: syntax, defining packages, package access and classpath, Exceptions: the exception handling cycle, exception bubbling, finally block, nested exceptions, limitations.

UNIT-V: ACTION SCRIPT-III

Authoring an Action Script 2.0 class, An OOP Application Development, Using Components with Action Script 2.0, MovieClip Subclasses.

UNIT-VI: MULTIMEDIA DATA COMPRESSION-I

Lossless compression algorithms: introduction, basics of information theory, run length coding, variable length coding, dictionary based coding, arithmetic coding, lossless image compression, Lossy compression algorithms: quantization,transform coding,wavelet based coding.

UNIT-VII: MULTIMEDIA DATA COMPRESSION-II

Image compression techniques: JPEG standard, JPEG 2000, Audio compression techniques: ADPCM in speech coding, G.726 ADPCM, Vocoders, Video compression techniques: Introduction to video compression, video compression based on motion compensation, MPEG-1, MPEG-2.

UNIT-VIII: MULTIMEDIA NETWORK COMMUNICATIONS AND APPLICATIONS

Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MoD).

TEXT BOOKS:

1. Ze-Nian Li and Mark S. Drew, *Fundamentals of Multimedia,* Pearson Education, 2008.

2. Colin Moock, *Essentials ActionScript 2.0*, SPD O'Reilly, 2005.

REFERENCE BOOKS:

1. Nigel Chapman and Jenny Chapman, *Digital Multimedia,* 2nd edition, Wiley Dreamtech, 2004.
2. Brian Underdahl, *Macromedia Flash MX,* TMH, 2002.
3. Fred Halsall, *Multimedia Communications,* Pearson, 2004
4. K.R.Rao, Zoram S. Bojkovic, *Multimedia Communication Systems,* Pearson Education, 2002.

IV B.Tech. I Semester

10BT71204: CRYPTOGRAPHY AND NETWORK SECURITY

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

Security Attacks - Interruption, Interception, Modification and Fabrication. Security Services - Confidentiality, Authentication, Integrity, Non-repudiation, Access Control and Availability. Security Mechanisms. A model for Internetwork security, Internet Standards and RFCs, Conventional Encryption Principles, Ceaser Cipher, Hill cipher, Poly and Mono Alphabetic Cipher.

UNIT-II: ENCRYPTION PRINCIPLES

Conventional encryption algorithms: Feistal structure, DES algorithm, S-Boxes, Triple DES, Advanced Data Encryption Standard (AES),Cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT-III: CRYPTOGRAPHY AND APPLICATIONS

Public key cryptography principles, public key cryptography algorithms, Digital signatures, RSA, Elliptic Algorithms, Digital Certificates, Certificate Authority and key management, Kerberos, X.509 Directory Authentication Service.

UNIT-IV: ELECTRONIC MAIL SECURITY

Email privacy: PGP operations, Radix-64 Conversion, Key Management for PGP, PGP Trust Model, Multipurpose Internet Mail Extension (MIME), Secure MIME (S-MIME).

UNIT-V: IP SECURITY ARCHITECTURE AND SERVICES

IP Security Overview, IP Security Architecture, Security Association, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management: OAKLEY key determination protocol, ISAKMP.

UNIT-VI: WEB SECURITY

Web Security Considerations, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT-VII: NETWORK MANAGEMENT SECURITY

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.

System Security: Intruders-Intrusion techniques, Intrusion Detection, Password Management, Bot nets.

Malicious Software: Viruses and related threats, Virus Counter Measures, Distributed Denial of Service Attacks.

UNIT-VIII: FIREWALLS

Firewall Design principles, Trusted Systems, Common Criteria for Information Technology Security Evolution.

TEXT BOOKS:

1. William Stallings, *Network Security Essentials Applications and Standards,* 3rd edition, Pearson Education.
2. Stallings, *Cryptography and network Security*, 3rd edition, PHI/ Pearson.

REFERENCE BOOKS:

1. Eric Maiwald, *Fundamentals of Network Security*, Dreamtech press, 2004.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World*, 2nd edition, Pearson/PHI.
3. Robert Bragg, Mark Rhodes, *Network Security: The complete reference*, TMH, 2004.
4. Buchmann, *Introduction to Cryptography*, 2nd edition, Springer, 2004.

IV B.Tech. I Semester

10BT71205: PARALLEL COMPUTING (ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO PARALLEL COMPUTING

Motivating parallelism, Scope of Parallel Computing, Organization and contents of the text.

Parellel Computing Platforms: Trends in Micro Processor Architectures, Limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel platforms, routing mechanisms for Inter connection networks.

UNIT-II: PRINCIPLES OF PARALLEL ALGORITHM DESIGN

Decomposition techniques, Characteristics of tasks and Interactions, Mapping techniques for load balancing, Parallel Algorithm Models.

UNIT-III: ANALYTICAL MODELING OF PARALLEL PROGRAMS

Source of Overhead in Parallel programs, Performance Metrics for Parallel systems, Scalability of Parallel systems, Asymptotic Analysis of Parallel Programs.

UNIT-IV: DENSE MATRIX ALGORITHMS

Matrix Vector Multiplication, Matrix -matrix Multiplication. SORTING: Issues in Sorting on Parallel computing, Sorting networks, Bubble sort and its variants.

UNIT-V: GRAPH ALGORITHMS

Definitions and Representation, Prim's and Dijkstra's Algorithms, Algorithms for Sparse graphs.

UNIT-VI: SEARCH ALGORITHMS FOR DISCRETE OPTIMIZATION PROBLEMS

Definitions and Examples, Sequential Search Algorithms, Parallel Depth- First Search, Parallel Best-first Search, Speedup Anomalies in Parallel Algorithms.

UNIT-VII: DYNAMIC PROGRAMMING

Overview of Dynamic programming, Serial Monadic DP formulations, Non serial Monadic DP formulations, Serial polyadic DP formulations, Non Serial polyadic DP formulations.

UNIT-VIII: FAST FOURIER TRANSFORM

The Serial Algorithm, The Binary-Exchange Algorithm, The transpose Algorithm.

TEXT BOOK:

1. Anath Gramma, Vipin Kumar, Anshul Guptha, *An Introduction to Parallel Computing: Design and Analysis of Algorithms,* Pearson Education, 2nd edition, Addison Wesley Publisher, 2003.

REFERENCE BOOK:

1. C. Bischof et al. *Parallel Computing: Architectures, Algorithms and Applications,* IOS Press, 2008.

IV B.Tech. I Semester

10BT71206: **E - COMMERCE**
(ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

Electronic Commerce Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT-II: CONSUMER ORIENTED ELECTRONIC COMMERCE

Consumer Oriented Applications, Mercantile Process models from the consumer's Perspective and from the Merchant's Perspective.

UNIT-III: ELECTRONIC PAYMENT SYSTEMS

Types of Electronic Payment Systems, Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

UNIT-IV: INTER ORGANIZATIONAL COMMERCE

EDI, EDI Implementation, MIME and Value added networks.

UNIT-V: INTRA ORGANIZATIONAL COMMERCE

Work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT-VI: CORPORATE DIGITAL LIBRARY

Document Library, digital Document types, issues behind document infrastructure, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT-VII: CONSUMER SEARCH AND RESOURCE DISCOVERY

Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT-VIII: MULTIMEDIA AND DIGITAL VIDEO

Key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing, Desktop video conferencing, broadband telecommunication.

TEXT BOOK:

1. Ravi Kalakota, Andrew B. Whinston, *Frontiers of Electronic Commerce,* Pearson Education, 2009.

REFERENCE BOOKS:

1. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, E-*Commerce fundamentals and applications,* John Wiley, 3rd edition, 2007.
2. S.Jaiswal, *E-Commerce,* Galgotia, revised edition, 2008
3. Efrain Turbon, Jae Lee, David King, H.Michael Chang, *E-Commerce.*
4. Gary P.Schneider, Thomson, *Electronic Commerce,* 4th annual edition.

IV B.Tech. I Semester

10BT71207: ADVANCED DATABASES (ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.

Distributed DBMS Architecture: DBMS Standardization, Architectural Models for Distributed DBMSs, Distributed DMBS Architecture.

UNIT-II: DISTRIBUTED DATABASE DESIGN

Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

Query Processing and Query Decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, Query decomposition, Localization of distributed data.

UNIT-III: OPTIMIZATION OF DISTRIBUTED QUERIES

Query optimization, centralized query optimization, Distributed query optimization algorithms**.**

Introduction to Transaction Management: Definition of a Transaction, Properties of Transactions, Types of Transactions.

UNIT-IV: DISTRIBUTED CONCURRENCY CONTROL

Serializability Theory, Taxonomy of concurrency control Mechanisms, Locking based Concurrency control Algorithms, Time stamp based and Optimistic concurrency control Algorithms, Deadlock Management.

UNIT-V: DATABASE SECURITY

Security Issues, Granting and Revoking Privileges, Multilevel Security, Statistical Database Security, Challenges of Database Security.

UNIT-VI: XML AND INTERNET DATABASES

Structured, Semistructured and Unstructured data, XML Hierarchical Data Model, XML Documents and Databases, XML Schema.

UNIT-VII: GEOGRAPHIC INFORMATION SYSTEMS

Applications, Data Management Requirements, Data Operations, problems and Future Issues.

UNIT-VIII: ADVANCED DATABASES AND APPLICATIONS

Object Databases, Temporal Databases, Multimedia Databases, Spatial Databases, Mobile Databases, Data mining Concepts and Overview of Data warehousing and OLAP.

TEXT BOOKS:

1. M.Tamer OZSU and Patrick Valduriez, *Principles of Distributed Database Systems,* Pearson Eduction, 2008.

2. R.Elmasri, S.B.Navathe, S.K.Gupta, D.V.L.N.Somayajulu, *Fundamentals of DB Systems,* Pearson Education, 2008.

REFERENCE BOOKS:

1. Stefano Ceri and Giuseppe Pelagatti, *Distributed Databases: Principles and Systems,* TMH, 1985.
2. Henry F Korth, A Silberchatz and S.Sudarshan, *Database System Concepts,* 5th edition, MGH, 2006.
3. Raghu Ramakrishnan and Johhanes Gehrke, *Database Management Systems,* 3rd edition, MGH, 2003.

IV B.Tech. I Semester

10BT71208: SOFTWARE PROJECT MANAGEMENT (ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I: SOFTWARE EFFORTS ESTIMATION TECHNIQUES

The waterfall model, conventional software Management performance.

Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT-II: IMPROVING SOFTWARE ECONOMICS

Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections, The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT-III: LIFE CYCLE PHASES

Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT-IV: MODEL BASED SOFTWARE ARCHITECTURES

A Management perspective and technical perspective.

Workflows of the process: Software process workflows, Iteration workflows,

UNIT-V: CHECKPOINTS OF THE PROCESS

Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT-VI: PROJECT ORGANIZATIONS AND RESPONSIBILITIES

Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation: Automation Building blocks, The Project Environment.

UNIT-VII: PROJECT CONTROL AND PROCESS INSTRUMENTATION

The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation. Tailoring the Process: Process discriminants.

UNIT-VIII: NEXT GENERATION SOFTWARE ECONOMICS

Modern Project Profiles, Next generation Software economics, modern process transitions.

Case studies: The command Center Processing and Display system-Replacement (CCPDS-R), Process Improvement and Mapping to the CMM.

TEXT BOOK:

1. Walker Royce, Software Project Management, Pearson Education, 2005.

REFERENCE BOOKS:

1. Bob Hughes and Mike Cotterell, Software Project Management,Tata McGraw- Hill Edition,2006.
2. Joel Henry, Software Project Management, Pearson Education, 2003.

IV B.Tech. I Semester

10BT71209: ENTERPRISE RESOURCE PLANNING (ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO ERP

Evolution of ERP - The Advantages of ERP - Integrated Management Information - Integrated Data Model - Business Process Reengineering, Executive Information Systems- Supply Chain Management.

UNIT-II: BUSINESS MODELING FOR ERP

Building the Business Model: Finance, Plant Maintenance, Quality Management, Materials Management- Benefits of ERP : Reduction of Lead-Time, On-time shipment, Reduction in Cycle Time, Improved Resource Utilization, Better Customer Satisfaction, Improved Supplier Performance, Increased Flexibility, Reduced Quality Costs, Improved Information Accuracy and Decision making Capability.

UNIT-III: THE DEVELOPMENT OF ERP

ERP Software Emerges: SAP and R/3: SAP Begins Developing Software Modules, SAP R/3, New Directions in ERP, SAP R/3 Software Implementation.

UNIT-IV: PROCESS MODELING, PROCESS IMPROVEMENTS

Process Modeling: Flowcharting Process Models, Fitter Snacker Expense Report Process, Extensions of Process Mapping, Event Process Chain (EPC) Diagrams. Process Improvement: Evaluating Process Improvement, ERP Workflow Tools.

UNIT-V: ERP IMPLEMENTATION LIFECYCLE

ERP Implementation: Pre-evaluation Screening, Package Evaluation, Project Planning Phase, Gap Analysis, Reengineering, Configuration, Implementation Team Training, Testing, End-user Training, Post-implementation - Role of Consultant, Vendors and Users.

UNIT-VI: FUTURE DIRECTIONS IN ERP

New Markets, New Channels, Faster Implementation Methodologies, Business Models and BAPIs, Convergence on Windows NT, Application Platforms, New Business Segments, More Features, Web Enabling.

UNIT-VII: ERP PACKAGES

Introduction - SAP AG, Oracle Corporation, People Soft, JD Edwards World Solutions Company, Baan Company.

UNIT-VIII: CASE STUDIES

SAP R/3 at Kapp, Germany - PeopleSoft at Alcone Marketing Group- SAP R/3 at Mercedes-Benz - Oracle at Cisco-System - PeopleSoft at Morrison Express Corporation Ltd. - Oracle at Amwest Surety Insurance Company, Bann at Phonix Contractors A/S.

TEXT BOOKS:

1. Alexis Leon, *Enterprise resource planning,* Tata McGraw Hill Publishing Company Limited, 1999.

2. Ellen Monk, Bret Wagner, *Concepts In Enterprise Resource Planning,* 2nd edition, Thomson.

REFERENCE BOOKS:

1. Alexis Leon, *ERP - Demystified,* 2nd edition, Tata McGraw Hill, 2008.
2. Vinodkumar Garg and V. K. Ventikrishnan, *Concepts in Enterprise Resource Planning,* 2nd edition, PHI, 2004.

IV B.Tech. I Semester

10BT62301: BIO - INFORMATICS (ELECTIVE - II)

L	T	P	C
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UNIT-I: INTRODUCTION TO BIOINFORMATICS

Internet basics, Scope of bioinformatics, elementary commands and protocols, ftp, telnet, http, primer on information theory, introduction to perl and bioperl.

UNIT-II: INTRODUCTION TO HOMOLOGY

Introduction to homology with special mention to Charles Darwin, Sir Richard Owen, Willie Henning, Alfred Russel Wallace.

UNIT-III: SPECIAL TOPICS IN BIOINFORMATICS

DNA mapping and sequencing, map alignment, large scale sequencing methods - shotgun and Sanger method. Linkage analysis - Map marker and Darwin.

UNIT-IV: SEQUENCE ALIGNMENT AND DYNAMIC PROGRAMMING

Heuristic alignment algorithms, global sequence alignments- needleman-Wunsch algorithm, local sequence alignments- smith-waterman algorithm, amino acid substitution matrices- PAM and BLOSUM.

UNIT-V: PRIMARY DATABASE AND THEIR USE

Introduction to biological databases - organization and management, searching and retrieval of information from the World Wide Web, Structure databases - PDB (Protein Data Bank), Molecular Modeling Databases (MMDB), primary databases- NCBI, EMBL, DDBJ.

UNIT-VI: SECONDARY DATABASES

Introduction to secondary databases- organization and management of databases Swiss-Prot, PIR, KEGG.

UNIT-VII: BIOCHEMICAL DATA BASES

Introduction to biochemical databases-organization and Management of databases. KEGG, ExPASy, BRENDA, WIT.

UNIT-VIII: EVOLUTIONARY TREES AND PHYLOGENY

Multiple sequence alignment and phylogenetic analysis.

TEXT BOOKS:

1. Hooman H. Rashidi and Lukas K. Buehler, *Bioinformatics Basics, Applications in Biological Science and Medicine,* 2nd edition, CRC Press, Taylor and Francis Group, 2005.

2. Anna Tramantano, *Introduction to Bioinformatics,* 1st edition, Chapman and Hall / CRC Press, Taylor and Francis Group, 2001.

REFERENCE BOOKS:

1. David Mount, *Bioinformatics*, 2nd edition, CSHL Press, 2005.
2. Editor: Sandor Suhai, *Genomics and Proteomics-Functional and Computational aspects,* 1st edition, Springer Publications, 2001.
3. Stephen Misener and Stephen A. Krawetz, *Bioinformatics-Methods and Protocols,* Human Press, 2003.
4. Andreas D. Baxevanis and B. F. Francis Ouellette, *Bioinformatics - A Practical guide to the Analysis of Genes and Proteins,* 3rd edition, John Wiley and Sons, Inc, 2004.
5. Lan Korf, *Mark Yandell, Joseph Bedell, BLAST: An Essential guide,* O'Reilly publishers, 2005.

IV B.Tech. I Semester

10BT71210: EMBEDDED SYSTEMS DESIGN (ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO EMBEDDED SYSTEMS

Embedded Systems, Processor Embedded into a system, Embedded Hardware units and devices in a system, Embedded software in a system, examples of embedded systems, embedded system-on-chip(soc) and use VLSI circuit design technology, Complex Systems Design and processors, design process and design Examples, classification of embedded systems, skills required for an embedded system designer.

UNIT-II: 8051 AND ADVANCED PROCESSOR ARCHITECTURES

8051 architecture, real world interfacing, introduction to advanced architectures, processor and memory organization, instruction level parallelism, performance metrics, memory types, memory-maps and addresses, processor selection, memory selection, IO types and examples, serial communication devices, parallel device ports, wireless devices, timer and counting devices, Networked Embedded systems, internet enabled systems, wireless and mobile system protocols.

UNIT-III: DEVICE DRIVERS AND INTERRUPT SERVICE MECHANISM

Programmed- I/O Busy wait approach without interrupt service mechanism, ISR Concept, Interrupt sources, Interrupt servicing Mechanism, Multiple Interrupts, context and the periods for context switching, Interrupt latency and deadline, classification of processors interrupt service mechanism from context saving angle, Direct Memory Access, device driver programming.

UNIT-IV: PROGRAMMING CONCEPTS AND PROGRAM MODELING CONCEPTS

Software programming in ALP and high level language 'C', C program elements-header and source files and preprocessor directives, macros and functions, data types, data structures, modifiers, statements, loops and pointers. Program models, DFG Models, State machine programming models for event-controlled program flow, modeling of multi processor systems, UML Modelling.

UNIT-V: INTER PROCESS COMMUNICATION

Multiple Processes in an application, Multiple Threads in an application, tasks, Task states, Task and data, clear cut distinction between functions, ISRS and tasks, concept of semaphores, Shared data, Inter Process Communication, Signal Function, Semaphore Functions, Message queue functions, Mail Box Functions, Pipe functions, Socket Functions, RPC functions.

UNIT-VI: REAL TIME OPERATING SYSTEMS

OS services, process management, Timer functions, Event Functions, memory management, Device, file and IO Subsystems Management, Interrupt routines in RTOS Environment and handling of interrupt source calls, Basic design using RTOS, RTOS scheduling models, interrupt latency and response of the tasks as performance metrics, OS security issues RTOS Programming: Micro/OS-II, VxWorks, Windows CE, OSEK and RTLinux.

UNIT-VII: DESIGN EXAMPLES AND CASE STUDIES OF PROGRAM MODELING AND PROGRAMMING WITH RTOS

Case studies: Automatic chocolate vending machine, Communication between orchestra robots, Embedded system for smart card, Mobile phone software for key Inputs.

UNIT-VIII: EMBEDDED SOFTWARE DEVELOPMENT, TESTING, SIMULATION AND DEBUGGING

Host and target machines, linking and locating software, getting embedded software into Target system, testing on host machines and simulators.

TEXT BOOK:

1. Raj Kamal, *Embedded Systems Architecture, Programming and Design,* 2nd edition, McGraw-Hill Companies, 2008.

REFERENCE BOOKS:

1. Frank Vahid, Tony D. Givargis, *Embedded System Design- A Unified Hardware/Software Introduction,* John Wiley, 2002.
2. KVKK Prasad, *Embedded/ Real Time Systems,* Dreamtech Press, 2005.
3. David E. Simon, *An Embedded Software Prime,* Pearson Education, 2005.
4. Michael J Pont, *Embedded C,* Pearson Education, 2007.

IV B.Tech. I Semester

10BT70402: DIGITAL IMAGE PROCESSING (ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I: DIGITAL IMAGE FUNDAMENTALS

Image sensing and acquisition, Image sampling and quantization, some basic relationships between pixels. Mathematical tools used in digital image processing - array Vs matrix operations, linear Vs non linear operations, Arithmetic operations, Set and Logical operations, Spatial operations, vector and matrix operations, Probabilistic methods.

UNIT-II: IMAGE TRANSFORMS

2D-DFT and properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar-Transform, Slant Transform, Hotelling Transform.

UNIT-III: IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN

Basic Intensity transformations functions, Histogram processing, Fundamentals of Spatial Filtering, Smoothing spatial filters, Sharpening spatial filters, Combining spatial Enhancement methods.

UNIT-IV: IMAGE ENHANCEMENT IN FREQUENCY DOMAIN

Basics of filtering in frequency domain, Correspondence between filtering in the spatial and frequency domains, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters, Homomorphic filtering.

UNIT-V: IMAGE RESTORATION

Noise models, Restoration in the presence of Noise only-spatial filtering - mean, order- statistic and adaptive filters, Estimating the degradation function, Inverse filtering, Weiner filtering, Constrained least squares filtering.

UNIT-VI: IMAGE SEGMENTATION

Point, line and edge Detection, Thresholding, Region based Segmentation, The use of motion in Segmentation.

UNIT-VII: IMAGE COMPRESSION

Need for Image Compression, Classification of redundancy in Images, Image Compression models, Classification of image compression schemes, Run length coding, Arithmetic coding, Block truncation coding, Dictionary based compression, Transform based compression, Image compression standards.

UNIT-VIII: COLOR IMAGE PROCESSING

Color models, Pseudo color image processing, Color transformations, Smoothing and Sharpening, Image segmentation based on color.

TEXT BOOKS:

1. R. C .Gonzalez and R.E. Woods, *Digital Image Processing,* 2nd edition, Addison Wesley/Pearson Education, 2002.

2. Malay K. Pakhira, *Digital Image processing and Pattern Recognition,* PHI, 2011.

REFERENCE BOOKS:

1. Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, *Digital Image processing using MATLAB,* Tata McGraw Hill, 2010.
2. S jayaraman, S Esakkirajan, T Veerakumar, *Digital Image processing,* Tata McGraw Hill.
3. A .K. Jain, *Fundamentals of Digital Image processing,* PHI.

IV B.Tech. I Semester

10BT70502: SOFTWARE TESTING TECHNIQUES (ELECTIVE - II)

L	T	P	C
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UNIT-I: INTRODUCTION AND THE TAXONOMY OF BUGS

Purpose of Testing, Some Dichotomies, A Model for Testing, The Consequences of Bugs, A Taxonomy for Bugs, Some Bug Statistics.

UNIT-II: FLOW GRAPHS AND PATH TESTING

Path-Testing Basics, Predicates, Path Predicates and Achievable Paths, Path Sensitizing, Path Instrumentation, Implement and Application of Path Testing.

UNIT-III: TRANSACTION-FLOW TESTING AND DATA-FLOW TESTING

Transaction Flows, Transaction-Flow Testing Techniques, Dataflow Testing Basics, Data-Flow Testing Strategies, Application, Tools, Effectiveness.

UNIT-IV: DOMAIN TESTING

Domains and Paths, Nice and Ugly Domains, Domain Testing, Domains and Interfaces Testing, Domains and Testability.

UNIT-V: PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS

Path Products and Path Expressions, A Reduction Procedure, Applications, Regular Expressions and Flow-Anomaly Detection.

UNIT-VI: LOGIC BASED TESTING

Motivational Overview, Decision Tables, Path Expressions Again, KV Charts, Specifications.

UNIT-VII: STATES, STATE GRAPHS AND TRANSITION TESTING

State Graphs, Good State Graphs and Bad, State Testing, Testability Tips.

Graph Matrices and Applications: Motivational overview, The Matrix of a Graph, Relations, The Powers of a Matrix, Node-Reduction Algorithm, Building Tools.

UNIT-VIII: AN OVERVIEW OF SOFTWARE TESTING TOOLS

Overview of WinRunner and QTP Testing Tools for Functional/ Regression Testing, Testing an Application Using WinRunner and QTP, Synchronization of Test Cases, Data-Driven Testing, Testing a Web Application.

TEXT BOOKS:

1. Boris Beizer, *Software Testing Techniques,* 2nd edition, Dreamtech Press, 2004.

2. Dr.K.V.K.K.Prasad, *Software Testing Tools,* Dreamtech Press, 2008.

REFERENCE BOOKS:

1. William E.Perry, *Effective Methods of Software Testing*, 3rd edition, John Wiley, 2007.

2. Glenford J.Myers, *The Art of Software Testing,* 2nd edition, Wiley-India, 2006.

IV B.Tech. I Semester

10BT80504: CLOUD COMPUTING (ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO CLOUD COMPUTING

The History and Future of Cloud, Cloud Computing Basics, Overview of Cloud Computing- Components, Infrastructure and Services, Usage of Cloud Computing, Benefits and Limitations, Cloud Infrastructure Models, Cloud computing protocols and On-Demand services.

UNIT-II: CLOUD COMPUTING ARCHITECTURE

Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, Distributed Computing and Cloud Application Architectures.

UNIT-III: INTRODUCTION TO VIRTUALIZATION

History of virtualization, objectives of virtualization, benefits of virtualized technology, the virtual service desk, virtualizability, related forms of computing, virtualization processes.

UNIT-IV: VIRTUALIZATION TECHNOLOGIES

VMware, Microsoft Hyper-V, Virtual Iron, Xen, Ubuntu (Server Edition), Software Virtualization, Para Virtualization, OS Virtualization, Oracle Virtualization, Storage Virtualization Technologies, Virtualization and Storage Management.

UNIT-V: SECURITY

Security issues in Cloud Computing - Data Security, Network Security, and Host Security.

UNIT-VI: DISASTER RECOVERY

Disaster Recovery Planning, Disasters in the Cloud, Disaster Management. Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale.

UNIT-VII: GRAPH REDUCTION

Introduction, Types of Graphs, Examples, Representation and Application.

UNIT-VIII: CASE STUDIES

Google APP Engine, Yahoo Hadoop, OBIEE and Windows Azure.

TEXT BOOKS:

1. George Reese, *Cloud Application Architectures Building Applications and Infrastructure in the Cloud,* O'Reilly Media Released, 2009.

2. Ivanka Menken and Gerard Blokdijk, *Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book,* Emereo Pvt Ltd, 2009.

REFERENCE BOOKS:

1. Rajkumar Buyya, James Broberg and Andrzej Goscinski, *Cloud computing principles and paradigms,* john Wiley and sons, 2011.
2. Michael Miller, *Cloud Computing,* 1st edition, Dorling Kindersley India, 2009
3. Danielle Ruest, Mhe, *Virtualization: A Beginner's Guide,* 1st edition, 2009
4. Barrie Sosinsky, *Cloud Computing bible,* Wiley India Pvt Ltd, 2011.

IV B.Tech. I Semester

10BT71211: **WEB PROGRAMMING LAB**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. Design the following static web pages required for an online book store web site.

A. Home Page:

The static home page must contain the following three frames:

Top frame: Logo and the book store name and links to Home page, about us page, collections page, contact us page and cart page.

Left frame: At least four links for navigation, which will display the book catalogue of respective areas. For e.g.: when you click the link "Computer" the catalogue for computer books should be displayed in the right frame.

Right frame: The pages of the links in the left and top frame must be loaded here. Initially it will display the description of the web site, i.e., page of the Home link will be loaded.

<table>
<tr><td>Logo</td><td colspan="4">Name of the Book Store</td></tr>
<tr><td>Home</td><td>About Us</td><td>Collections</td><td>Contact Us</td><td>Cart</td></tr>
<tr><td>Computer
Electrical
Electronic
Bio-Tech</td><td colspan="3">Description of the Web Site</td><td>Sign In
New User?
Sign Up</td></tr>
</table>

B. Login Page:

The login page looks like as follows (Link this page to Sign In link):

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	User ID: [ ] Password: [ ] [Submit] [Reset] New User? Sign Up			

2. Design the following static web pages for an online book store web site.

A. Catalogue Page:

The catalogue page should contain the details of books available in the web site. The details are as follows:

a. Snap shot of cover page b. Text book name
c. Author name d. Publisher
e. Price f. Add to cart link.

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	Computer Books			

Cover Page	Book Details	Price	Remarks
	Book : XML Bible Author : Winston Publication : Wiley	INR 399.00	Add to Cart
	Book : Multimedia Author : Ze Nian Li Publication : Prearson	INR 455.00	Add to Cart
	Book : HTML Author : Watson Publication : SPD	INR 355.00	Add to Cart

B. Registration Page:

Design the Registration page with the following fields (Link this page to Sign Up link).

a. First Name
b. Last Name
c. User ID
d. Password
e. Confirm Password
f. Gender
g. Date of Birthh. Address
i. Postal Code
j. Linguistics
k. Mobile No.
l. Email-ID

C. Cart Page:

Logo	Name of the Book Store			
Home	About Us	Collections	Contact Us	Cart
Computer Electrical Electronic Bio-Tech	**Selected Books** Book Name — Price — Quantity — Amount XML bible — 399.00 — 2 — INR 798.00 HTML — 355.00 — 1 — INR 355.00 **Total amount (INR): 1153.00**			

3. Write a JavaScript code to validate the following fields of the registration page.
    a. First Name/Last Name - should contain only alphabets and the length should not be less than 3 characters.
    b. User ID - It should contain combination of alphabets, numbers and _. It should not allow spaces and special symbols.
    c. Password - It should not be less than 8 characters in length.
4. Write a JavaScript code to validate the following fields of the registration page.
    a. Date of Birth - It should allow only valid date; otherwise display a message stating that entered date is invalid. Ex. 29 Feb. 2009 is an invalid date.
    b. Mobile No. - It should allow only numbers and total number of digits should be equal to 10.

c. E-mail id - It should allow the mail id with the following format:
Ex. mailid@domainname.com

5. Apply the following styles to static pages of online book store web site using CSS (Cascading Style Sheets):
   a. Fonts and Styles: font-family, font-style, font-weight and font-size
   b. Backgrounds and colors: color, background-color, background-image and background-repeat
   c. Text: text-decoration, text-transformation, text-align and text-indentation, text-align
   d. Borders: border, border-width, border-color and border-style
   e. Styles for links: A:link, A:visited, A:active, A:hover
   f. Selectors, Classes and Layers.

6. Write an XML file which includes the following:
   a. Title of the book
   b. Author of the book
   c. ISBN number
   d. Name of the publisher
   e. Edition
   f. Price
   i. Write a Document Type Definition (DTD) or XML Schema to validate the above XML file.
   ii. Display the contents of the XML file with the following format using XSL.

The contents should be displayed in a table. The header of the table should be in color grey, and the author names should be displayed in red color, bold and capitalized. Use your own colors for remaining fields.

7. a. Deploy web pages of online book store web site using Apache Tomcat web server and then navigate them thorough the default port number of the tomcat web server.
   b. Write a Java Servlet program for displaying the system date.
   c. Write a Java Servlet program to red user name and his/her favorite color from the html form. Dsplay the name of the user in green color and set user favorite color as a background color to the web page.

8. Write a Java Servlet program to read the user id and password entered in the Login form and authenticate with the values (user id and passwords) available in the cookie and web.xml file. If he/she is a valid user (i.e., user id and password match) you should welcome him/her by user id otherwise you should display a message stating that you are not an authorized user. Use the following methods for storing user id's and passwords:

a. Using Cookes - Assume four user id's user1, user2, user3 and user4 and their passwords pwd1, pwd2, pwd3 and pwd4 respectively. Create four cookies on four user id's and passwords.

b. Initialization Parameters in web.xml - Store the user id's and passwords in the web.xml file and access them through the servlet by using the getInitParameters() method.

9. Write a Java Servlet or JSP to store user details (entered in the Registration Form) into the database using JDBC. Use any RDBMS as backend for storing user details.

10. Write a Java Servlet or JSP to authenticate the user by reading user id and password entered in the Login form. Compare User id and password values with user id's and passwords stored at database. If he/she is a valid user (i.e., user id and password match) you should welcome him/her by name (first name + last name), otherwise you should display a message stating that you are not an authorized user.

11. a. Write a Java program for storing books details like Name of the text book, author, publisher, edition and price into the database using JDBC. Store books in database based on the category (i.e., Computer/Electrical/Electronic/Bio-Tech).

b. Write a Java servlet or JSP for updating catalogue page to extract books details from the database and then display them in tabular format using JDBC.

12. HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalogue page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time (i.e., from different systems in the LAN using the IP-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated. Modify your catalogue and cart pages to achieve the above mentioned functionality using sessions.

IV B.Tech. I Semester

10BT71212: MULTIMEDIA AND APPLICATIONS DEVELOPMENT LAB

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THE FOLLOWING EXPERIMENTS ARE TO BE DEVELOPED USING ADOBE FLASH TOOL:

1. Draw an object and apply the following animation techniques:
   a. Motion Tween b. Rotaion
   c. Shrink and Grow d. Shape Tween
   e. Add Guide Layer
2. a. Animate a Flash movie that shows the truck moving behind the trees.
   b. Animate a Flash movie that shows the Flag hoisting.
3. a. Animate a Flash movie that shows the Spotlight Masking. Use text as a masked object and circle as a mask object.
   b. Create a Flash movie that shows the complete word will appear on the stage from letters that fly in from various points. Use graphical text while animating the movie.
4. Animate a Flash movie that shows rolling wheels on a moving vehicle. Create a movie clip symbol of a rolling wheel and then add two instance of that symbol to the vehicle. Apply motion tween to make the vehicle drive across the road.
5. Create a Flash movie that enables the user to click left and right arrow buttons to view the images of the Movie Clip in left and right directions respectively. Initially add a set of images to the Movie Clip and then view the images of the Movie Clip through the buttons by writing necessary action script code.

   Note: Left and Right arrow buttons should be created by the user.
6. Create a Flash movie that accepts User Id and Password from the user. Validate User Id and Password fields whenever the user presses the submit button. If a user id and password are correct display a welcome message otherwise display a message as invalid user. Store different user's user id's and passwords using an array object.
7. Create a Flash movie that allows the user to control the movement of the movie clip through the keyboard. Once the

user presses the Left, Up, Right and Down arrow keys of the keyboard, the movie clip should move in Left, Upward, Right and Downward directions respectively. Make sure that, the movie clip will move in a specified boundary of the stage.

8. Write an Action Script application to sort N integer array elements.
9. Write an Action Script application to display Movie Clip's randomly.
10. Write an Action Script application to determine points along a circle.
11. Write an Action Script application to perform the following operations.

    a. Drawing a Line b. Drawing a Curve

    c. Drawing a Rectangle d. Filling a shape with specified color

    e. Filling a shape with gradient color
12. Write an Action Script application to apply the mask to an image.
13. Write an Action Script application to convert Indian currency to foreign currency.
14. Write an Action Script application to link MovieClip symbol with subclass of MovieClip class by using linkage property.
15. Write an Action Script application to design/validate the User Registration form.

IV B.Tech. I Semester

10BT7HS01: PROFESSIONAL ETHICS (AUDIT COURSE)

L	T	P	C
-	-	3	-

UNIT-I: ENGINEERING ETHICS

Scope and aims of engineering ethics-Senses of Engineering Ethics-Variety of Moral Issues-Types of Inquiry- Moral Dilemmas,- Moral Autonomy- Kohlberg's Theory, Gilligan's theory, Consensus and Controversy.

UNIT-II: PROFESSIONAL IDEALS AND VIRTUES

Theories about virtues, professional responsibility, integrity, self-respect, sense of "responsibility". Self-Interest, Customs and Religion- Self-interest and ethical egoism, customs and ethical relativism, religion and divine command ethics. Use of ethical theories- resolving moral dilemmas and Moral leadership.

UNIT-III: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation- similarities to standard experiments, learning from the past and knowledge gained. Engineering as Responsible experiments-Conscientiousness. Moral autonomy and accountability, the challenger case.

UNIT-IV: RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty, Respect for authority, collective bargaining, confidentiality, conflict of interests, occupational crime. Rights of Engineers- Professional rights, whistle-blowing, The bart case, employee rights and discrimination.

UNIT-V: GLOBAL ISSUES

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Managers, Consultants and Leaders. Engineers as managers - Managerial ethics applied to engineering profession.

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, Ethics in Engineering, Tata McGraw-Hill, 3rd edition, 1996, 2007.

2. Govindarajan M, Nata Govindarajan. M, Natarajan. S, Senthilkumar. V.S, Engineering Ethics, Prentice Hall of India, 2004.

REFERENCE BOOKS:

1. Dr. S. Kannan, K. Srilakshmi, Human Values and Professional Ethics, Taxmann Allied Services pvt ltd., 2009.

2. Edmund G seebauer and Robert L Barry, Fundamental of Ethics for scientists and Engineers, Oxford University Press, Oxford, 2001.

3. Charles F Fledderman, Engineering ethics, Pearson Education/ Prentice Hall, NewJercy, 2004.

IV B.Tech. II Semester

10BT6HS01: **MANAGEMENT SCIENCE**

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO MANAGEMENT

Concepts of management and organization - Nature and Importance of management - Evolution of management thought - Functions of management - Contributions of F.W. Taylor and Henri Fayol to the management - Systems approach to management - Managerial skills - Elements of corporate planning process - Environmental scanning - SWOT Analysis - Social responsibilities of management.

UNIT-II: DESIGNING ORGANIZATIONAL STRUCTURES

Basic concepts related to organization - Departmentation and decentralization - Types of organizations - Merits, demerits and adoptability to modern firms.

UNIT-III: OPERATIONS MANAGEMENT

Principles and types of plant layout - Methods of production - Forecasting - Forecasting methods - Work study - Basic procedure involved in method study and work measurement - Statistical quality control: Factors affecting quality - Quality control using control charts (simple problems) - Acceptance sampling.

UNIT-IV: MATERIALS MANAGEMENT

Materials management objectives - Inventory - Types of inventory - Safety stock - Classical EOQ model - Need for inventory control - EOQ simple problems - ABC analysis - Purchase pro cedure - Stores management.

Marketing: Functions of marketing - Marketing mix - Channels of distribution.

UNIT-V: HUMAN RESOURCES MANAGEMENT (HRM)

Nature and scope of HRM - HRD and personnel management and industrial relations - Functions of HRM - Role of HR Manager in an organization - Performance appraisal - Job evaluation and merit rating - Motivation - Importance of motivation - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

UNIT-VI: PROJECT MANAGEMENT (PERT/CPM)

Network analysis - Program evaluation and review technique (PERT) - Critical path method (CPM) - Identifying critical path - Probability of completing the project within given time - Project cost analysis - Project crashing (simple problems).

UNIT-VII: ENTREPRENEURSHIP

Introduction to entrepreneurship - Definition of an entrepreneur - Entrepreneurial traits - Entrepreneur vs. manager - Entrepreneurial decision process - Role of entrepreneurship in economic development - Social responsibilities of entrepreneurs - Opportunities for entrepreneurs in India and abroad - Women as an entrepreneur.

UNIT-VIII: CONTEMPORARY MANAGEMENT PRACTICES

Basic concepts of Just-In-Time (JIT) system - Total quality management (TQM) - Value chain analysis - Enterprise resource planning (ERP) - Business process outsourcing (BPO) - Globalization-Management challenges - Intellectual property rights - Supply chain management - Role of information technology in managerial decision making.

TEXT BOOKS:

1. O.P. Khanna, *Industrial Engineering and Management,* Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management,* 6th edition, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement,* 12th edition, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6th edition, TMH, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2nd edition, TMH, New Delhi.
4. Heinz Weihrich and Harold Koontz, *Management- A Global Perspective,* 10th edition, McGraw-Hill International.

IV B.Tech. II Semester

10BT81201: SERVICE ORIENTED ARCHITECTURE (ELECTIVE - III)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCING SOA

Fundamental SOA, Common Characteristics of Contemporary SOA, Common tangible benefits of SOA, Common pitfalls of adopting SOA.

The Evolution of SOA: An SOA Timeline, The continuing evolution of SOA, The roots of SOA.

UNIT-II: WEB SERVICES AND PRIMITIVE SOA

The Web Services Frame work, Services, Service descriptions, Messaging.

Web Services and Contemporary SOA (Part I-Activity Management and Composition): Message exchange patterns, Service Activity Coordination, Atomic transactions, Business Activities, Orchestration, Choreography.

UNIT-III: WEB SERVICES AND CONTEMPORARY SOA (PART II-ADVANCED MESSAGING, METADATA, AND SECURITY)

Addressing, Reliable messaging, Correlation, Policies, Metadata exchange, Security, Notification and eventing.

UNIT-IV: PRINCIPLES OF SERVICE-ORIENTATION

Service - Orientation and the enterprise, Anatomy of SOA, Common Principles of Service-Orientation, Interrelation between Principles of Service-Orientation, Service Orientation and Object Orientation, Native Web Services support for Principles of Service-Orientation.

UNIT-V: SERVICE LAYERS

Service-Orientation and Contemporary SOA, Service Layer abstraction, Application Service Layer, Business Service Layer, Orchestration Service Layer, Agnostic Services, Service Layer Configuration Scenarios.

SOA Delivery Strategies: SOA delivery lifecycle phases, The top-down strategy, The bottom-up strategy, The agile strategy.

UNIT-VI: SERVICE ORIENTED ANALYSIS

Part I-Introduction: Introduction to Service Oriented Analysis, Benefits of a Business Centric SOA, Deriving Business Services.

Part II-Service Modeling: Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT-VII: SERVICE ORIENTED DESIGN

Part I-Introduction: Introduction to Service-Oriented design, WSDL related XML Schema language basics, WSDL language basics, Service interface design tools.

Part II-SOA Composition Guidelines: SOA Composing steps, Considerations for choosing service layers, Considerations for positioning core SOA standards, Considerations for choosing SOA extensions.

Part III-Service Design: Service Design overview, Entity-centric business Service Design, Application Service Design, Task-centric business Service Design, Service Design guidelines.

UNIT-VIII: SERVICE ORIENTED DESIGN (PART IV-BUSINESS PROCESS DESIGN)

WS-BPEL language basics, WS- Coordination overview, Service Oriented Business process Design.

Fundamental WS-* Extensions: WS-Addressing language basics, WS-Reliable Messaging language basics, WS-Policy language basics, WS-Metadata Exchange language basics, WS-Security language basics**.**

TEXT BOOK:

1. Thomas Erl, *Service-Oriented Architecture - Concepts, Technology, and Design,* Pearson Education, 2005.

REFERENCE BOOKS:

1. Jeff Davies & others, *The Definitive guide to SOA,* Apress, Dreamtech, 2007.
2. E.Hewitt, *Java SOA Cook book,* SPD, 2009.
3. N.M.Josuttis , *SOA in Practice,* SPD, 2007.
4. M.Rosen and others, *Applied SOA,* Wiley India pvt. Ltd, 2009.

IV B.Tech. II Semester

10BT81202: INFORMATION RETRIEVAL SYSTEMS (ELECTIVE - III)

L	T	P	C
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UNIT-I: INTRODUCTION

Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

UNIT-II: INFORMATION RETRIEVAL SYSTEM CAPABILITIES

Search, Browse, Miscellaneous.

UNIT-III: CATALOGING AND INDEXING

Objectives, Indexing Process, Automatic Indexing, Information Extraction.

UNIT-IV: DATA STRUCTURES

Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT-V: AUTOMATIC INDEXING

Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

UNIT-VI: DOCUMENT AND TERM CLUSTERING

Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-VII: USER SEARCH TECHNIQUES

Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext.

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-VIII: TEXT SEARCH ALGORITHMS

Introduction, Software text search algorithms, Hardware text search systems.

Multimedia Information Retrieval: Audio retrieval, Graph retrieval, Image retrieval, Video retrieval.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example - TREC results.

TEXT BOOK:

1. Kowalski, Gerald, Mark T Maybury, *Information Storage and Retrieval Systems: Theory and Implementation,* Kluwer Academic Press ,1997.

REFERENCE BOOKS:

1. Frakes, W.B., Ricardo Baeza-Yates, *Information Retrieval Data Structures and Algorithms,* Prentice Hall,1992.
2. Ricardo Baeza-Yates, *Modern Information Retrival,* Pearson Education, 1997.
3. Robert Korfhage, *Information Storage and Retieval,* John Wiley and Sons, 1997.

IV B.Tech. II Semester

10BT81203: INTELLECTUAL PROPERTY RIGHTS (ELECTIVE - III)

L	T	P	C
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UNIT-I: INTRODUCTION

Definition, Attributes of intellectual property, Divisions of intellectual property: copy rights, patents, designs, Trademarks. Development of the law of intellectual property and international laws impact on it, Benefits of protection of intellectual property, Local Remedies, Introduction to PTO and FTO.

UNIT-II: INTERNATIONAL LAW ON INTELLECTUAL PROPERTY

World Intellectual Property Organisation (W.I.P.O), Patent Cooperation Treaty (P.C.T), W.I.P.O Copyright Treaty, TRIP'S Agreement, General Agreement on Tariffs and Trade(GATT).

UNIT-III: LAW OF COPYRIGHT IN INDIA

Introduction, Object of Copyrights, Extension of Copyrights to various new fields, Statement of objects and Reason, Subject- matter of Copyrights, Modes of Copyrights, Registration of Copyrights, Copyrights societies, International Copyrights, Authorities under the Copyright act.

UNIT-IV: LAW OF PATENTS IN INDIA

Introduction, How patent is granted and Rights conferred thereby, Amendment, Restoration, Surrender and Revocation of Patents, Anticipation.

UNIT-V: LAW OF TRADEMARKS IN INDIA

Introduction, Development of the Law of Trademarks, International Conventions, Treaties and Protocols on implementation of Inter-State Trade marks, Registration of Trademarks.

UNIT-VI: LAW OF DESIGNS IN INDIA

Introduction, Registration of designs, Copyright of registered designs, Controller functions and powers against the orders, Industrial and International Exhibition and Piracy of Registered designs.

UNIT-VII: THE GEOGRAPHICAL INDICATIONS OF GOODS

Introduction, Geographical indication, The Register and conditions for registration, procedure for registration, Rights conferred by registration, Infringement and reliefs.

UNIT-VIII: CASE STUDIES

Patents (Google, Yahoo and Microsoft etc), Disputes.

TEXT BOOKS:

1. R.K.Nagarajan, *Intellectual Property Law*, 3rd edition, Allahabad Law Agency publications, 2007.

2. S.K.Singh, *Intellectual Property Rights Laws,* 1st edition, Central Law Agency publications, 2009.

REFERENCE BOOKS:

1. Subbaram N.R and S.Viswanathan , *Handbook of Indian Patent Law and Practice,* Printers and Publishers Pvt. Ltd., 1998.

2. Adam Jolly and Jeremy Philpott (eds), *A Handbook of Intellectual Property Right Management: Protecting, developing and exploiting your IP assets,* London, Kogan Page, 2004.

3. Dr. G.B. Reddy, *Intellectual Property Rights and the Law,* Gogia Law Agency, 2005.

4. B.L. Wadhera, *Intellectual Property Law,* Universal Publishers, 2007.

IV B.Tech. II Semester

10BT81204: DISTRIBUTED SYSTEMS (ELECTIVE- III)

L	T	P	C
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UNIT-I: INTRODUCTION

Introduction to Distributed systems, Examples of distributed systems, Resource sharing and the web, Challenges. System models: Introduction, Architectural models, Fundamental models.

UNIT-II: TIME AND GLOBAL STATES

Clocks, events and process states, Synchronizing physical clocks, Logical time and logical clocks, Global states, Distributed debugging, Distributed mutual exclusion.

UNIT-III: NETWORKING AND INTERNETWORKING

Introduction, Types of network, Network principles, Internet protocols, Network case studies: Ethernet, Wireless LAN and ATM.

UNIT-IV: INTER PROCESS COMMUNICATION

Introduction, The API for the internet protocols, External data representation and marshalling, Client server communication, Group Communication, Case study.

Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.

UNIT-V: OPERATING SYSTEM SUPPORT

Operating system layer, Protection, Process and Threads, Communication and invocation, Operating System Architecture.

UNIT-VI: DISTRIBUTED FILE SYSTEMS

File System Architecture, SUN Network File System, The Andrew File System, Recent advances.

Name Services: Introduction, Name services and the Domain Name System, Directory and discovery services, Case study of the Global Name Services.

UNIT-VII: DISTRIBUTED TRANSACTIONS AND CONCURRENCY CONTROL

Transactions, Nested Transactions, Locks, Optimistic Concurrency control, Time stamp ordering. Flat and nested distributed transactions, Atomic commit protocols, Concurrency control in Distributed transactions, Distributed deadlocks, Transaction recovery.

UNIT-VIII: DISTRIBUTED SHARED MEMORY

Design and implementation issues, Sequential consistency and ivy, Release consistency and Munin, Other consistency models.

TEXT BOOK:

1. G Coulouris, J Dolimore and T Kindberg, *Distributed Systems Concepts and Design,* 3rd edition, Pearson Education, 2002.

REFERENCE BOOKS:

1. A.S.Tanenbaum and M.V.Steen, *Distributed Systems - Principles and Paradigms,* Pearson Education, 2002.
2. M Singhal, N G Shivarathri, *Advanced Concepts in Operating Systems,* Tata McGraw-Hill Edition, 2003.

IV B.Tech. II Semester

10BT81205: MIDDLEWARE TECHNOLOGIES (ELECTIVE- III)

L	T	P	C
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UNIT-I: INTRODUCTION TO CLIENT SERVER COMPUTING

Evolution of corporate computing models from centralized to distributed computing, client server models, Benefits of client server computing, pitfalls of client server programming.

UNIT-II: CORBA WITH JAVA

Review of Java concept like RMI, RMI API, JDBC, Client/Server CORBA-style, The object web.

UNIT-III: INTRODUCING C# AND THE .NET PLATFORM

Object -Oriented Programming with C#, Callback Interfaces, Delegates and Events, Understanding .NET Assemblies.

UNIT-IV: BUILDING C# APPLICATIONS

Type Reflection, Late Binding and Attribute-Based Programming, Object Serialization and the .NET Remoting Layer, Data Access with ADO.NET, XML Web Services.

UNIT-V: CORE CORBA / JAVA

Two types of Client/ Server invocations-static, dynamic, The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count, multi count.

UNIT-VI: EXISTENTIAL CORBA

CORBA initialization protocol, CORBA activation services, CORBA IDL mapping, CORBA java- to- IDL mapping, The introspective CORBA/ Java object.

UNIT-VII: JAVA BEAN COMPONENT MODEL

Events, properties, persistency, Intrespection of beans, CORBA Beans.

UNIT-VIII: EJBS AND CORBA

Object transaction monitors, CORBA OTM's, EJB and CORBA OTM's, EJB container framework, Session and Entity Beans, The EJB client/ server development Process, the EJB container protocol, support for transaction, EJB packaging, EJB design Guidelines.

TEXT BOOKS:

1. Robert Orfali and Dan Harkey, *Client/Server programming with Java and CORBA, 2nd* edition, John Wiley and Sons, 2008.

2. Andrew Troelsen, *C# and the .NET Platform,* 2nd edition, Apress Wiley-dreamtech, 2003.

REFERENCE BOOKS:

1. D T Dewire, *Client/Server Computing,* 2nd edition, Tata Mc GrawHill Publications, 2008.

2. Robert Orfali Dan Harkey and Jeri Edwards, *Client/Server Survival Guide,*3rd edition, John Wiley and Sons, 2008.

IV B.Tech. II Semester

10BT81206: SOFTWARE PATTERNS (ELECTIVE- IV)

L	T	P	C
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UNIT-I: ENVISIONING ARCHITECTURE

Definition of Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views and the Architecture Business Cycle.

UNIT-II: CREATING AN ARCHITECTURE

Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT-III: ANALYZING ARCHITECTURES

Architecture Evaluation, Architecture design decision making, ATAM, CBAM.

Moving from One System to Many: Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT-IV: INTRODUCTION TO DESIGN PATTERNS

Definition, Pattern Description, Organizing catalogs, Role in solving design problems, Selection and Usage.

UNIT-V: CREATIONAL PATTERNS

Abstract factory, builder, factory method, prototype, singleton.

Structural Patterns**:** Adapter, bridge, composite, decorator, façade, flyweight, Proxy.

UNIT-VI: STRUCTURAL PATTERNS

Decorator, façade, flyweight, Proxy**.**

Behavioral Patterns: Chain of responsibility, command.

UNIT-VII: BEHAVIORAL PATTERNS

Interpreter, iterator, mediator, memento, observer, state, strategy, template method, and visitor.

UNIT-VIII: CASE STUDIES

Designing a Document Editor - Design issues of Lexi Editor in Deign Patterns, The World Wide Web - a case study in interoperability.

TEXT BOOKS:

1. Len Bass, Paul Clements and Rick Kazman, *Software Architecture in Practice,* 2nd edition, Pearson Education,2003.

2. Erich Gamma, *Design Patterns,* Pearson Education, 1995.

REFERENCE BOOKS:

1. David M. Dikel, David Kane and James R. Wilson, *Software architecture,* Prentice Hall PTR, 2001.
2. Eric Freeman and Elisabeth Freeman, *Head First Design patterns,* O'REILLY, 2007.
3. Steven John Metsker and William C. Wake, *Design Patterns in Java,* Pearson education, 2006.

IV B.Tech. II Semester

10BT71504: NETWORK MANAGEMENT (ELECTIVE- IV)

L	T	P	C
4	-	-	4

UNIT-I: DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW

Analogy of Telephone Network Management, Communication Protocols and Standards, Case Histories on Networking and Management, Network Management Functions, Network and System Management.

UNIT-II: BASIC FOUNDATIONS

Standards, Models, and Language, Network Management Standards, Network Management Models: Organization Model, Information Model, Communication Model, Functional Model, Network Management Applications, Abstract Syntax Notation One: ASN.1, Encoding Structure.

UNIT-III: SNMPV1 NETWORK MANAGEMENT

History of SNMP Management, Internet Organizations and Standards, SNMP Model, Organization and Information Models, Communication and Functional Models.

UNIT-IV: SNMPV2 NETWORK MANAGEMENT

SNMPv2, Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

UNIT-V: SNMPV3 NETWORK MANAGEMENT

SNMPv3, SNMPv3 Key Features, SNMPv3 Documentation Architecture, SNMPv3 Applications, SNMPv3 Management Information Base, SNMPv3 User-based Security Model, Access Control.

UNIT-VI: REMOTE MONITORING

RMON, Remote Monitoring, RMON SMI and MIB, RMON1, RMON2, A Case Study on Internet Traffic Network management tools, systems and engineering.

UNIT-VII: TELECOMMUNICATIONS MANAGEMENT NETWORK

TMN Conceptual model, TMN standards, TMN Architecture, TMN implementation, Network Management Applications.

UNIT-VIII: BROAD BAND NETWORK MANAGEMENT

WAN, Wired and optical access Networks, advanced management topics. Distributed Network Management, Reliable and Fault Tolerant Network Management.

TEXT BOOK:

1. Mani Subramanian, *Network Management: Principles and Practice,* Pearson Education, 2010.

REFERENCE BOOKS:

1. William Stallings, *SNMP, SNMPv2, SNMPv3, AND RMON 1 and 2*, 3rd edition, Addison- Wesley, 1999.
2. Morris, *Network Management,* Pearson Eduction 2006.
3. Mark Burges, *Principles of Network System Administration,* Wiley Dreamtech, 2008.
4. Paul, *Distributed Network Management,* John Wiley, 2000.

IV B.Tech. II Semester

10BT70505: SOFT COMPUTING (ELECTIVE- IV)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Introduction to Soft Computing, Soft Computing Constituents and Conventional AI, Soft Computing Characteristics.

Fuzzy Set Theory: Fuzzy Sets - Introduction, Basic Definition and Terminology, Set-theoretic Operations, MF Formulation and Parameterization.

UNIT-II: FEED FORWARD NEURAL NETWORKS

Adaptive Networks: Introduction, Architecture, Back Propagation for Feed Forward Networks, Extension Back Propagation for Recurrent Networks, Hybrid Learning Rule: Batch Learning, Pattern by Pattern Learning, Different Ways of Combining Steepest Descent LSE, Counter Propagation Networks, Adaptive Resonance Theory Network, Radial Basis Function Network.

UNIT-III: FEEDBACK NEURAL NETWORKS

Supervised Learning: Introduction, Perceptrons, Back Propagation Multilayer Perceptrons.

Unsupervised Learning: Introduction, Competitive Learning Networks, Kohonen Self-Organizing Networks, Learning Vector Quantization, Hebbaian Learning, The Hopfield Network.

UNIT-IV: FUZZY RULES AND FUZZY REASONING

Introduction, Extension Principles and Fuzzy Relations, Fuzzy If-Then Rules, Fuzzy Reasoning.

Fuzzy Interference Systems: Introduction, Mamdani Fuzzy Models, Sugeno Fuzzy Models, Tsukamoto Fuzzy Models.

UNIT-V: OPTIMIZATION AND GENETIC ALGORITHMS

Least Squares Methods for System Identification: Introduction, Basics of Matrix Manipulation and Calculus, Least Squares Estimator, Recursive Least Squares Estimator, Recursive LSE for Time Varying Systems. Derivative-based Optimization: Introduction, Non-linear Least Squares Problems. Derivative-Free Optimization: Introduction, Genetic Algorithms, Simulated Annealing (TSP), Random Search.

UNIT-VI: NEURO FUZZY CONTROL

Neuro Fuzzy Control-I: Introduction, Feedback Control Systems and Neuro Fuzzy Control, Expert Control, Inverse Learning, Specialized learning, Back Propagation Through Time and Real Time Recurrent Learning.

Neuro Fuzzy Control-II: Introduction, Reinforcement Learning Control, Gradient-Free Optimization, Gain Scheduling.

UNIT-VII: NEURO FUZZY MODELING

Adaptive Neuro-Fuzzy Interference Systems: Introduction, Architecture, Hybrid Learning Algorithm, Learning Methods that Cross-fertilize ANFIS and RBFN.

Coactive Neuro-fuzzy Modeling: Towards Generalized ANFIS-Introduction, Frame Work, Neuron Functions for Adaptive Networks, Neuro-Fuzzy spectrum.

Advanced Neuro Fuzzy Modeling: Classification and Regression Trees, Data Clustering Algorithms: Introduction, K-Means Clustering, Fuzzy C-Means Clustering.

UNIT-VIII: ADVANCED APPLICATIONS:

ANFIS Applications: Introduction, Printed Character recognition, Inverse Kinematics Problem, Automobile MPG Identification, Nonlinear System Identification, Channel Equalization.

Fuzzy Sets and Genetic Algorithms in Game Playing: Introduction, Variants of Genetic Algorithm, Using Genetic Algorithms in Game Playing, Simulation Results of the Basic Models, Using Fuzzily Characterized Features, Using Polyploid GA in Game Playing.

TEXT BOOK:

1. Jang J.S.R., Sun C.T. and Mizutani E, *Neuro-Fuzzy and Soft computing,* Prentice Hall, 2010.

REFERENCE BOOKS:

1. LiMin Fu ,*Neural Networks in Computer Intelligence*, Tata McGraw-Hill Edition
2. Timothy J.Ross, *Fuzzy Logic with Engineering Applications,* McGraw-Hill, 1997.
3. Davis E.Goldberg, *Genetic Algorithms: Search, Optimization and Machine Learning,* Addison Wesley, N.Y., 1989.
4. S.Rajasekaran and G.A.V.Pai, *Neural Networks, Fuzzy Logic and Genetic Algorithms,* PHI, 2003.
5. James A. Freeman/David M.Skapura, *Neural Network Algorithms, Application and Programming Techniques,* Pearson Education.
6. Simson Haykin, *Neural Networks,* 2nd edition, Pearson Education.

IV B.Tech. II Semester

10BT80502: HUMAN COMPUTER INTERACTION (ELECTIVE - IV)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Importance of user Interface - definition, importance and benefits of good design, a brief history of Screen design.

UNIT-II: THE GRAPHICAL USER INTERFACE

Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user interface-popularity, characteristics, Principles of user interface design.

UNIT-III: DESIGN PROCESS

Human interaction with computers, importance of human characteristics, human consideration in design, Human interaction speeds, Understanding business functions.

UNIT-IV: SCREEN DESIGNING

Design goals - Screen planning and purpose, organizing screen elements, ordering of screen data and content - screen navigation and flow - Visually pleasing composition - amount of information - focus and emphasis - presentation information simply and meaningfully - information retrieval on web - statistical graphics - Technological consideration in interface design.

UNIT-V: WINDOWS

System menus and Navigation schemes, selection of window, selection of devices based controls and screen based controls, organize and layout windows and web pages, Touch screen and surface computing.

UNIT-VI: COMPONENTS

Text and messages, Icons and images, Multimedia, Colours - colours uses, problems with colours, choosing colours.

UNIT-VII: SOFTWARE TOOLS

Specification methods-Grammars, Menu-Selection and Dialog-box trees, Transition diagrams, State charts, Interface Building Tools-Interface mockup tools, Software-engineering tools.

UNIT-VIII: INTERACTION DEVICES

Keyboard and function keys - pointing devices - speech recognition, digitization and generation, image and video displays.

TEXT BOOKS:

1. Wilbert O Galitz, *The essential guide to user interface design,* Wiley India education.

2. Ben Shneidermann, *Designing the user interface,* 3rd edition Pearson Education Asia.

REFERENCE BOOKS:

1. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Rssell Bealg, *Human Computer Interaction,* Pearson.
2. Prece Rogers, Sharps, *Interaction Design,* Wiley Dreamtech.
3. Soren Lauesen, *User Interface Design,* Pearson Education.

IV B.Tech. II Semester

10BT81207: WIRELESS NETWORKS (ELECTIVE - IV)

L	T	P	C
4	-	-	4

UNIT-I: OVERVIEW OF WIRELESS NETWORKS

Introduction - Information Network infrastructure, Overview of existing network infrastructure, Applications, Evaluation of voice-oriented wireless Networks, Evaluation of Data-oriented wireless Networks, different generations of Wireless networks - 1G, 2G, 3G and beyond.

UNIT-II: CHARACTERISTICS OF THE WIRELESS MEDIUM

Introduction, radio propagation mechanisms, path-loss modeling and signal coverage, effects of multi path and Doppler, channel measurement and modeling techniques.

UNIT-III: PHYSICAL LAYER ALTERNATIVES FOR WIRELESS NETWORKS

Introduction, applied wireless transmission techniques, short distance base band transmission, UWB pulse transmission, Carrier Modulated transmission, Broadband modems for higher speeds, Spread Spectrum transmissions, High-speed Modems for Spread spectrum technology, Diversity and Smart Receiving Techniques, Comparison of modulation schemes, Coding techniques for wireless communications.

UNIT-IV: WIRELESS MEDIUM ACCESS ALTERNATIVES

Introduction, fixed-assignment access for Voice-Oriented networks, Random access for Data-Oriented Networks, Integration of Voice and Data Traffic - Data Integration in voice- Oriented Networks and Voice Integration into Data- Oriented Networks.

UNIT-V: NETWORK PLANNING

Introduction, wireless network topologies, Cellular Topology, Cell Fundamentals, Signal-to-interference ratio calculation, capacity Expansion Techniques, network planning for CDMA systems.

UNIT-VI: WIRELESS NETWORK OPERATION

Introduction, mobility management, radio resources and power management, security in wireless networks.

UNIT-VII: WIRELESS WANS

GSM, Mechanisms to support a Mobile Environment, communications in the infrastructure, CDMA - The IS-95 CDMA Forward Channel, The IS-95 CDMA Reverse Channel, Mobility and Radio Resource Management in IS-95**.**

UNIT-VIII: WIRELESS LANS

Evaluation of the WLAN industry, Wireless Home networking, IEEE 802.11, Bluetooth, interface between Bluetooth and 802.11, Zigbee wireless communications protocol.

Wireless Geolocation Systems**:** Wireless Geolocation System Architecture, Technologies for wireless Geolocation.

TEXT BOOKS:

1. Kaveh Pahlavan and Prashant Krishnamurthy, *Principles of Wireless Networks-a Unified approach,* Prentice-Hall of India Pvt Ltd, 2006

REFERENCE BOOKS:

1. William Stallings, *Wireless communications and Networks,* Pearson education, 2005.
2. Theodore s. Rappaport, *Wireless Communications -principles and practice,* 2nd edition,PHI, 2002.
3. Jim Geier, *Wireless Networks first-step,* Pearson education, 2005.
4. Sumit Kasera et al, *2.5G Mobile Networks: GPRS and EDGE,* Tata McGraw Hill, 2008.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (yearly pattern)

Common to ECE, EEE, EIE, E Con E , CSE, CSSE and IT

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT1BS04	Mathematical Methods	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics and Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language and Communication skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering and IT workshop	-	-	3	4	25	50	75
	TOTAL	**15**	**6**	**15**	**50**	**305**	**670**	**975**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF ELECTRONICS AND COMMUNICATON ENGINEERING

II B.Tech I Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT3BS03	Special Functions and Complex Analysis	4	1	-	4	30	70	100
10BT30401	Semiconductor Devices and Circuits	4	1	-	4	30	70	100
10BT30223	Circuit Theory	4	1	-	4	30	70	100
10BT3BS02	Environmental Sciences	4	1	-	4	30	70	100
10BT30402	Probability Theory and Stochastic Processes	4	1	-	4	30	70	100
10BT30403	Signals and Systems	4	1	-	4	30	70	100
10BT30411	Semiconductor Devices and Circuits Lab	-	-	3	2	25	50	75
10BT30412	Simulation Lab	-	-	3	2	25	50	75
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

II B.Tech II Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT40401	Electronic Circuit Analysis	4	-	-	4	30	70	100
10BT41301	Control Systems	4	1	-	4	30	70	100
10BT40402	Pulse and Digital Circuits	4	-	-	4	30	70	100
10BT40403	Electromagnetic Waves and Transmission Lines	4	1	-	4	30	70	100
10BT40404	Switching Theory and Logic Design	4	-	-	4	30	70	100
10BT40221	Principles of Electrical Engineering	4	1	-	4	30	70	100
10BT40411	Electronic Circuits Lab	-	-	3	2	25	50	75
10BT40231	Electrical Engineering Lab	-	-	3	2	25	50	75
10BT4HS02	Advanced English Communication Skills (Audit Course)	-	3	-	-	-	-	-
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF ELECTRONICS AND COMMUNICATON ENGINEERING

III B.Tech I Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT40501	Computer Architecture and Organization	4	1	-	4	30	70	100
10BT50401	Analog Communications	4	1	-	4	30	70	100
10BT50402	Antennas and Wave Propagation	4	1	-	4	30	70	100
10BT50403	Linear IC Applications	4	1	-	4	30	70	100
10BT50404	Digital IC Applications	4	1	-	4	30	70	100
10BT4HS01	Managerial Economics and Principles of Accountancy	4	1	-	4	30	70	100
10BT50411	Analog Communications Lab	-	-	3	2	25	50	75
10BT50412	Pulse and Digital Circuits Lab	-	-	3	2	25	50	75
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III B.Tech II Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
10BT60401	Digital Signal Processing	4	1	-	4	30	70	100
10BT60402	Digital Communications	4	-	-	4	30	70	100
10BT60403	Microwave Engineering	4	1	-	4	30	70	100
10BT60404	Microprocessors and Microcontrollers	4	1	-	4	30	70	100
10BT60405	VLSI Design	4	-	-	4	30	70	100
10BT60411	Microprocessors and Microcontrollers Lab	-	-	3	2	25	50	75
10BT60412	IC Applications and ECAD Lab.	-	-	3	2	25	50	75
10BT60413	Seminar	-	-	3	2	75	-	75
	Total	**24**	**3**	**9**	**30**	**305**	**520**	**825**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF ELECTRONICS AND COMMUNICATON ENGINEERING

IV B.Tech I Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT70401	Electronic Measurements and Instrumentation	4	1	-	4	30	70	100
10BT61202	Computer Networks	4	1	-	4	30	70	100
10BT40502	Object Oriented Programming	4	1	-	4	30	70	100
10BT70402	Digital Image Processing	4	1	-	4	30	70	100
Elective-I								
10BT70403	Spread Spectrum Communications	4	-	-	4	30	70	100
10BT70404	Telecommunication Switching Systems							
10BT70405	Embedded and real time Systems							
10BT70406	DSP Processors and Architecture							
Elective-II								
10BT70407	Optical Communications	4	-	-	4	30	70	100
10BT50504	Operating Systems							
10BT70408	Radar Systems							
10BT70409	Digital Design Through Verilog							
10BT70411	Digital Communications and Microwaves Lab	-	-	3	2	25	50	75
10BT70412	Digital Signal Processing Lab	-	-	3	2	25	50	75
10BT70413	Mini-Project	-	-	-	2	25	50	75
10BT7HS01	Professional Ethics (Audit Course)	2	-	-	-	-	-	-
	Total	**26**	**4**	**6**	**30**	**255**	**570**	**825**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF ELECTRONICS AND COMMUNICATON ENGINEERING

IV B.Tech II Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT80401	Cellular and Mobile Communications	4	1	-	4	30	70	100
Elective-III								
10BT80402	Wireless Communications & Networks	4	-	-	4	30	70	100
10BT71204	Cryptography and Network Security							
10BT80403	Television Engineering							
10BT80404	Advanced Digital Signal Processing							
Elective-IV								
10BT80405	Low Power VLSI Design	4	-	-	4	30	70	100
10BT80406	Satellite Communications							
10BT61002	Biomedical Instrumentation							
10BT71301	Neural Networks and Fuzzy Systems							
10BT80411	Comprehensive Viva-Voce	-	-	-	2	100	-	100
10BT80412	Project Work	-	-	12	12	75	150	225
	Total	**12**	**1**	**12**	**26**	**265**	**360**	**625**

Total Credits: 220
Total Marks: 5500

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1BS04: MATHEMATICAL METHODS

(Common to CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT–I

Matrices and Linear System of Equations : Rank of a matrix, echelon form, normal form, inverse of a matrix by normal form. Homogenous and non-homogenous linear systems, consistency and solutions of linear system of equations. Direct methods, Gauss elimination method, Gauss Siedel, Gauss Jordan method, factorization method.

UNIT-II

Eigen Values and Eigen Vectors : Definitions, evaluation of eigen values, eigen vectors and properties. Cayley Hamilton theorem (without proof), inverse and powers of a matrix by Cayley Hamilton theorem, diagonalization of a matrix, quadratic forms and reduction to its normal form (problems dealing with distinct eigen values only).

UNIT-III

Algebraic, Transcendental Equations and Curve Fitting: Solutions of algebraic and transcendental equations by bisection method, false position method, Newton-Raphson's method, iterative method. Curve fitting by the principle of least squares, fitting of a straight line, parabola, exponential and power curves.

UNIT-IV

Interpolation: Interpolation, forward difference operator, backward difference operator, central difference operator, relationship between operators, Newton's forward formula, Newton's backward formula, Gauss forward formula, Gauss backward formula, Lagranges interpolation formula.

UNIT-V

Numerical Differentiation and Integration: Numerical values of derivatives using Newton's forward formula, Newton's backward formula.

Numerical Integration: Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule.

UNIT-VI

Numerical Solutions of Ordinary Differential Equations: Numerical solutions of ordinary differential equations using Taylor series, Euler's method, modified Euler's method, Runge–Kutta method (2^{nd} and 4^{th} orders only), Milne's predictor corrector method.

UNIT-VII

Z – Transformations: Z–transforms, inverse Z–transform, properties, damping rule, shifting rule, initial and final value theorems. Convolution theorem, solution of difference equations by Z–transforms.

UNIT-VIII

Fourier Series and Fourier Transforms: Definition, Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd function, half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, properties, inverse transform, finite Fourier transforms.

TEXTBOOK:

Mathematical Methods, T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, S.Chand and Company, 5^{th} edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36^{th} Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley and Sons, Inc., 8^{th} Edition
3. *Introductory methods of Numerical Analysis ,* S.S.Sastry, Prentice Hall of India, 3^{rd} Edition
4. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3^{rd} Edition

B.Tech. I Year

10BT1EC01: **PROBLEM SOLVING AND COMPUTER PROGRAMMING**

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | $x^2 + y^2$| + $\sqrt{}$2xy
iii) $x^5 + 10\ x^4 + 8\ x^3 + 4\ x + 2$
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS03: SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: PARTIAL DIFFERENTIAL EQUATIONS
Formation of Partial differential equations, Solutions of first order Partial Differential Equations using Lagrange's method. Method of separation of variables - solutions of one dimensional wave equation - Heat equation- Two dimensional Laplace equation under boundary conditions.

UNIT-II: SPECIAL FUNCTIONS
Euler's Integrals - Beta and Gamma functions - properties - Relationship between beta and gamma functions- applications - evaluation of improper integrals using Beta and Gamma functions
BESSEL FUNCTION: Generating function-properties of Bessel functions - recurrence relations-Orthogonality.

UNIT-III: LIMITS AND CONTINUITY - ANALYTIC FUNCTIONS
Exponential, Trigonometric, logarithmic, Hyperbolic and general power (Z^c) - separation of real and imaginary parts - Limits and Continuity of functions. Differentiability - Analyticity - Cauchy Riemann equations- conjugate and harmonic conjugate functions - Milne Thompson method- potential functions.

UNIT-IV: COMPLEX INTEGRATION
Line integral - evaluation of line integrals along curves and closed contours - Cauchy's Integral theorem - Cauchy's integral formula - Derivatives of analytic function - generalized integral formula- Evaluation of integrals using integral formula.

UNIT-V: COMPLEX POWER SERIES
Taylor theorem (with proof) - Laurent's theorem (without proof) - Taylor and Laurent series expansions of complex functions - Singularities - types - residues - poles of order m.

UNIT-VI: RESIDUE CALCULUS
Residue theorem - proof - applications - evaluation of integrals using residue theorem - evaluation of improper and real integrals of the type

i) $\int_{-\infty}^{\infty} f(x)dx$ ii) $\int_{0}^{2\Pi} f(\cos\theta,\sin\theta)d\theta$ iii) $\int_{-\infty}^{\infty} e^{imx} f(x)dx$

UNIT-VII: ROUCHE'S THEOREM - APPLICATIONS

Argument principle - Rouche's theorem - determination of number of zeros of complex polynomials - maximum modules principle - Fundamental theorem of Algebra - Cauchy's inequality - Liouville's theorem.

UNIT-VIII: CONFORMAL MAPPING

Definitions and examples, Mappings defined by $w = e^z$, $\ln z$, z^2, $\sin z$, $\cos z$. Translation, Rotation, Inversion and Bilinear transformation - properties - fixed point - cross ratio - invariance of circles under bilinear transformation - determination of bilinear transformation using three given points.

TEXT BOOKS:

1. T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, *Mathamatical Methods*, 5th Revised Edition, S. Chand & Company, 2010.
2. T.K.V. Iyenger, B. Krishna Gandhi..et al., *Text book of Engineering Mathematics*, Vol-III, 8th Edition, S. Chand & Company, 2011.

REFERENCE BOOKS:

1. Grewal, B.S., *Higher engineering Mathematics*, 36th Edition, Khanna Publishers, Delhi.
2. Kreyszig, E., *Advanced Engineering Mathematics*, 8th Edition, John-Wiley.

II B.Tech. I Semester

10BT30401: SEMICONDUCTOR DEVICES AND CIRCUITS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: PN JUNCTION DIODE

PN Junction Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical, Static and Dynamic Resistances, Diode Equivalent circuits, Junction capacitances, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

UNIT-II: RECTIFIERS, FILTERS AND REGULATORS

Halfwave rectifier and fullwave rectifiers (Qualitative and quantitative analysis), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L - section filter, π - section filter, comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Problems on rectifier circuits.

UNIT-III: BIPOLAR JUNCTION TRANSISTOR

Transistor construction, BJT Operation, Transistor as an amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in Common Emitter, Common Base and Common Collector Configurations, BJT specifications.

UNIT-IV: TRANSISTOR BIASING AND STABILIZATION

Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in V_{BE} and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Condition for Thermal Stability in CE configuration, Problems on biasing circuits.

UNIT-V: SMALL SIGNAL ANALYSIS OF BJT AMPLIFIERS

BJT Modeling, Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using h-Parameters, Comparison of CB, CE and CC configurations, Simplified Hybrid Model, Millers Theorem, Dual of Millers Theorem.

UNIT-VI: FIELD EFFECT TRANSISTOR

Construction, Principle of Operation and Characteristics of JFET and MOSFET (Enhancement & Depletion), Small Signal Model of JFET &

UNIT-VII: FET AMPLIFIERS
Common Source and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, FET as Voltage Variable Resistor, Comparison between BJT and FET.

UNIT-VIII: SPECIAL PURPOSE ELECTRONIC DEVICES
Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR). Principle of operation of Schottky Barrier Diode.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits,* 1991 Edition, TMH, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits,* 9th Edition, PHI, 2006.
3. David A. Bell, *Electronic Devices and Circuits,* 5th Edition, Oxford University press, 2008.

REFERENCE BOOKS:

1. J. Millman and C.C. Halkias, *Integrated electronic*, TMH, 2nd Edition, 1998.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2nd Edition, BSP, 2005.
3. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7th Edition, PHI, 2005.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd Edition, TMH, 2008.
5. Henry and Jeager, *Semiconductor Devices and Circuits,* Mc-Graw Hill.

II B.Tech. I Semester

10BT30223: CIRCUIT THEORY

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : FUNDAMENTALS OF ELECTRICAL CIRCUITS
Concepts of charge, current, voltage and power, active & passive elements, reference concepts of direction for voltages & currents, voltage and current relationships for passive elements, Ohm's law, Kirchoff Laws, current division and voltage division rules, network reduction techniques, series, parallel, series-parallel circuits, star-delta and delta-star transformations, source transformation.

UNIT-II : BASIC NODAL & MESH ANALYSIS
Basic definitions: node, path, loop, branch , nodal analysis and super node concept, mesh analysis and super mesh concept - problems.

UNIT-III : FUNDAMENTALS OF AC CIRCUITS
Introduction - advantages of AC supply, types of waveforms, importance of sinusoidal waveforms, basic definitions: waveform, cycle, time period, frequency, amplitude, determination of average and RMS value, form factor & peak factor for different alternating waveforms, phase and phase difference.

UNIT-IV : SINGLE PHASE AC CIRCUITS
Sinusoidal response of R, L, C and combination of R, L, C circuits, concept of impedance and power triangles, power factor, resonance, bandwidth and quality factor for series and parallel networks, locus diagram.

UNIT-V : TRANSIENT ANALYSIS
Introduction - transient response of RL, RC and RLC for DC excitation, transient response of RL, RC and RLC for sinusoidal excitation, numerical problems.

UNIT-VI : MAGNETICALLY COUPLED CIRCUITS
Coupled circuits, self & mutual inductance, DOT conventions, coefficient of coupling, analysis of magnetic circuits: series, parallel and composite, comparison of electrical and magnetic circuits.

UNIT-VII : NETWORK THEOREMS - I
Thevenin's, Norton's, Maximum power transfer and Superposition theorems for DC and sinusoidal excitations - applications.

UNIT-VIII : NETWORK THEOREMS - II

Tellegen's, Millman's, Reciprocity, Substitution and Compensation theorems for DC and sinusoidal excitation - applications.

TEXT BOOKS:

1. A. Sudhakar & Shyam Mohan, *Electric Circuits*, TMH, 3rd Edition, 2007.
2. A. Chakrabarthi, *Circuits Theory*, Dhanpat Rai & Co, New Delhi, 2009.

REFERENCE BOOKS:

1. M.E. Van Valkenberg, *Network Analysis,* Pearson Publications, 3rd Edition, New Delhi 2006.
2. William H. Hayt & Jack E. Kennedy & Steven M. Durbin, *Engineering Circuit Analysis*, 6th Edition, TMH, 2009.
3. J.A. Edminister & M.D.Nahvy, *Theory and Problems of Electric Circuits,* Schaums Outline Series,4th Edition, TMH, 2004.
4. G. K. Mittal, Ravi Mittal, *Network Analysis*, Khanna Publishers, 14th Edition, New Delhi, 1997.
5. C. K. Alexander and M. N. O. Sadiku, *Fundamentals of Electric Circuits*, 3rd Edition, TMH, 2010.

II B.Tech. I Semester

10BT3BS02: ENVIRONMENTAL SCIENCES

(Common to BOT & ECE)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES
Definition and concept of the term environment – Various components of environment – Abiotic and biotic – Atmosphere – Hydrosphere – Lithosphere – Biosphere – Inter relationships – Need for public awareness – Role of important national and international individuals and organizations in promoting environmentalism.

UNIT-II: NATURAL RESOURCES, CONSERVATION AND MANAGEMENT
Renewable and Non renewable resources and associated problems – Forests: Deforestation, Causes, effects and remedies – Effects of mining, dams and river valley projects – case studies; Water resources: Water use and over exploitation – Conflicts over water – Large dams – benefits and problems; Food resources : World food problems – Adverse effects of modern agriculture – Fertilizer and pesticide problems; Land resources: Land degradation – Land slides- Soil erosion – desertification- water logging – salinity – Causes, effects and remedies; Mineral resources: Mining – Adverse effects; Energy resources: Growing needs – Renewable and Non renewable resources – Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear energy, Hydrogen fuel and Solar energy - Impact on environment - Sustainable life styles.

UNIT-III: ECOLOGY AND ECOSYSTEMS
Definitions and concepts – Characteristics of ecosystem – Structural and functional features – Producers, consumers and decomposers and food webs – Types of ecosystems – Forests grassland, desert, crop land, pond, lake, river and marine ecosystems – Energy flow in the ecosystem – Ecological pyramids – Ecological successions.

UNIT-IV: BIO DIVERSITY, CONSERVATION AND MANAGEMENT
Introduction – Definition and concept of biodiversity – Value of biodiversity – Role of biodiversity in addressing new millennium challenges – Global, national biodiversity – Hot spots of biodiversity – Threats to biodiversity – Man and wild life conflicts – Remedial measures – Endemic, endangered and extinct species – In-situ and ex-situ conservation of biodiversity.

UNIT-V: ENVIRONMENTAL POLLUTION AND CONTROL

Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution – Solid waste management – Causes, effects, control and disposal methods – Role of individuals in the prevention of pollution – Hazards and disaster management – Floods – Earthquakes – Tsunamis – Cyclones – Land slides – Case studies.

UNIT-VI: SOCIAL ISSUES AND THE ENVIRONMENT

Concept of sustainable development – Methods of rainwater harvesting – Watershed management – Waste land reclamation – Green cover – Green power – Green technology – Resettlement and rehabilitation of people and related problems – Case studies – Issues and possible solutions - Greenhouse effect and global warming – Carbon credits – Acid rains – Ozone layer depletion – Causes, effects and remedies – Consumerism and waste production – Environment protection acts – Air act – Water act – Forest conservation act – Wild life protection act – Issues involved in the enforcement.

UNIT-VII: HUMAN POPULATION AND ENVIRONMENT

Population growth and its impact on environment – Environmental ethics – Family welfare programmes – Human health: T.B., Cancer, HIV/AIDS – Causes, effects and remedies – Occupational health hazards – Human rights – Important international protocols and conventions on environment.

UNIT-VIII: FIELD WORK/ENVIRONMENTALIST'S DIARY/ ASSIGNMENTS/SEMINARS

TEXT BOOKS:

1. Erach Barucha, *Environmental Studies*, 1st Edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies,* 3rd Edition, New Age International Publishers, 2011.

REFERENCE BOOKS:

1. Desh wal, *Environmental Studies,* 2nd Edition, Khanna Publicaions, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1st Edition, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies,* 2nd Edition, TMH, 2010.

II B.Tech. I Semester

10BT30402: PROBABILITY THEORY AND STOCHASTIC PROCESSES

L	T	P	C
4	1	-	4

UNIT-I: PROBABILITY

Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes' Theorem, Independent Events.

UNIT-II: THE RANDOM VARIABLE

Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties.

UNIT-III: OPERATION ON SINGLE RANDOM VARIABLE

EXPECTATIONS: Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function.

TRANSFORMATIONS OF A RANDOM VARIABLE: Monotonic Transformations for a Continuous Random Variable, Nonmonotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable.

UNIT-IV: MULTIPLE RANDOM VARIABLES

Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, (Proof not expected). Unequal Distribution, Equal Distributions.

UNIT-V: OPERATIONS ON MULTIPLE RANDOM VARIABLES
Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

UNIT-VI: STOCHASTIC PROCESSES
Concept of Stochastic process, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationarity and Statistical Independence, First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, Nth-Order and Strict-Sense Stationarity.

UNIT-VII: STOCHASTIC PROCESSES – TEMPORAL CHARACTERISTICS
Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance and its properties, Linear system response of Mean and mean-squared value, Autocorrelation function, Cross-correlation functions, Gaussian Random Processes, Poisson Random Process.

UNIT-VIII: STOCHASTIC PROCESSES – SPECTRAL CHARACTERISTICS
The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation function.
SPECTRAL CHARACTERISTICS OF SYSTEM RESPONSE: Power density spectrum of response, Cross-power spectral density of input and output of a linear system.

TEXT BOOKS:

1. Peyton Z. Peebles, *Probability, Random Variables & Random Signal Principles,* 4th Edition, TMH, 2001.
2. Athanasios Papoulis and S. Unnikrishna Pillai, *Probability, Random Variables and Stochastic Processes,* 4th Edition, PHI, 2002.

REFERENCE BOOKS:

1. George R. Cooper, Clave D. MC Gillem, *Probability Methods of Signal and System Analysis,* 3rd Edition, Oxford University Press, 1999.
2. Henry Stark and John W. Woods, *Probability and Random Processes with Application to Signal Processing,* 3rd Edition, Pearson Education, 2002.
3. S.P. Eugene Xavier, *Statistical Theory of Communication,* 1st Edition, New Age Publications, 2003.

II B.Tech. I Semester

10BT30403: SIGNALS AND SYSTEMS

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: SIGNAL ANALYSIS
Signal definition, classification of signals, basic operations on signals, Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

UNIT-II: FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS
Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum.

UNIT-III: FOURIER TRANSFORMS
Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT-IV: SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS
System definition, classification of systems, Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

UNIT-V: CONVOLUTION AND CORRELATION OF SIGNALS
Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function. Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT-VI: LAPLACE TRANSFORMS
Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT-VII: SAMPLING
Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT-VIII: Z–TRANSFORMS
Discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms.

TEXT BOOKS:

1. B.P. Lathi, *Signals, Systems & Communications,* BS Publications, 2003.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, *Signals and Systems,* 2nd Edition, PHI.
3. Simon Haykin and Van Veen, *Signals & Systems,* 2nd Edition, Wiley.

REFERENCE BOOKS:

1. M.E. Van Valkenburg, *Network Analysis,* 3rd Edition, PHI, 2000.
2. Michel J. Robert, *Fundamentals of Signals and Systems,* McGraw-Hill, International Edition, 2008.
3. C. L. Philips, J.M.Parr and Eve A.Riskin, *Signals, Systems and Transforms,* 3rd Edition, Pearson Education, 2004.

II B.Tech. I Semester

10BT30411: SEMICONDUCTOR DEVICES AND CIRCUITS LAB

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

PART A: (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs.
2. Identification, Specifications and Testing of Active Devices, Diodes: BJTs, Low-power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
3. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO.

PART B: (Minimum of 10 experiments to be conducted)

1. Forward and Reverse bias characteristics of PN Junction diode
2. Zener diode characteristics and Zener as Voltage Regulator.
3. Input and Output characteristics of Transistor in CB Configuration.
4. Input and Output characteristics of Transistor in CE Configuration
5. Halfwave Rectifier with and without filters.
6. Fullwave Rectifier with and without filters.
7. FET characteristics
8. Measurement of h parameters of transistor in CE configurations
9. Frequency response of CE Amplifier.
10. Frequency response of CC Amplifier.
11. Frequency response of Common Source FET Amplifier.
12. SCR Characteristics.
13. UJT Characteristics.

II B.Tech. I Semester

10BT30412: SIMULATION LAB

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

List of Experiments:

1. Basic Operations on Matrices
2. Generation of Various signals and Sequences (Periodic and Aperiodic), Such as Unit Impulse, Unit Step, Square, Saw Tooth, Triangular, Sinusoidal, Ramp, Sinc function.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd Parts of Signal or Sequence and Real and Imaginary Parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation and Cross correlation between Signals and Sequences.
7. Verification of Linearity and Time Invariance Properties of a Given Continuous / Discrete System.
8. Computation of Unit Sample, Unit Step and Sinusoidal Responses of the Given LTI System and Verifying its Physical Realizability and Stability Properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given Signal and plotting its Magnitude and Phase Specturm.
11. Waveform Synthesis using Laplace Transform.
12. Locating Zeros and Poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
13. Generation of Gaussian Noise (Real and Complex), Computation of its Mean, M.S. Values and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.
15. Removal of Noise by Auto Correlation / Cross correlation in a given signal corrupted by noise.
16. Impulse response of a raised cosine filter.
17. Verification of Weiner-Khinchine Relations.
18. Checking a Random Process for Stationary in Wide Sense.

II B.Tech. II Semester

10BT40401: ELECTRONIC CIRCUIT ANALYSIS

(Common to ECE, EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I: SINGLE STAGE AMPLIFIERS
Classification of Amplifiers – Distortion in amplifiers, Analysis of CE, CC & CB Configurations with simplified hybrid model, Analysis of CE amplifier with Emitter Resistance and Emitter Follower, Design of single stage RC Coupled Amplifier Using BJT.

UNIT-II: MULTI STAGE AMPLIFIERS
Analysis of Cascaded RC Coupled BJT Amplifiers, Cascode Amplifier, Darlington Pair, Different Coupling Schemes used in Amplifiers – RC Coupled Amplifier, Direct and Transformer Coupled Amplifiers.

UNIT-III: BJT FREQUENCY RESPONSE
Logarithms, Decibels, General Frequency Considerations, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Effect of Coupling and Bypass Capacitors, The Hybrid –Pi, Common Emitter Transistor Model, CE Short Circuit Current Gain, Current Gain with Resistive Load, Single Stage CE Transistor Amplifier Response, Gain – Bandwidth product, Emitter Follower at Higher Frequencies.

UNIT-IV: MOSFET AMPLIFIERS
Basic Concepts, MOSFET Small Signal Model, Common Source Amplifier with Resistive Load, Diode Connected Load and Current Source Load, Source Follower, Common gate stage cascode and folded cascode amplifier and their Frequency Response.

UNIT-V: FEEDBACK AMPLIFIERS
Classification of Amplifiers, Concepts of Feedback, Classification of Feedback Amplifiers, General Characteristics of Negative Feedback Amplifiers, Effect of feedback on Amplifier Characteristics, Voltage Series, voltage Shunt, Current series and Current Shunt Feedback Configurations, Illustrative Problems.

UNIT-VI: OSCILLATORS

Conditions for oscillations, RC and LC Type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized Analysis of LC Oscillators, Quartz, Hartley and Colpitts Oscillators, RC-Phase Shift and Wien-Bridge Oscillators.

UNIT-VII: LARGE SIGNAL AMPLIFIERS

Class A Power Amplifier, Maximum Value of Efficiency of Class-A Amplifier, Transformer Coupled Amplifier, Transformer Coupled Audio Amplifier, Push Pull Amplifier - Complimentary Symmetry, Class - B Power Amplifier, Phase Inverters, Transistor power Dissipation.

UNIT-VIII: TUNED AMPLIFIERS

Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

TEXT BOOKS:

1. Jacob Millman and Christos C. Halkias, *Integrated Electronics,* McGraw-Hill.
2. Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits Theory*, 9th Edition, PE, 2008.
3. David A. Bell, *Electronic Devices and Circuits*, 5th Edition, Oxford University Press.
4. Behzad Razavi, *Design of Analog CMOS Integrated Circuits*, TMS, 2008.

REFERENCE BOOKS:

1. Donald A. Neaman, *Electronic Circuit Analysis and Design*, 3rd Edition, TMH, 2007.
2. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7th Edition, PEI, 2009.
3. Sedra/Smith, *Micro Electronic Circuits*, 5th Edition, Oxford University Press, 2009.
4. K. Lal Kishore, *Electronic Circuit Analysis*, BSP, 2004.
5. S. Salivahanan, N.Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd Edition, TMH, 2009.

II B.Tech. II Semester

10BT41301: CONTROL SYSTEMS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT I : INTRODUCTION
Concepts of Control Systems, Open Loop and closed loop control systems, Feed-Back Characteristics, Effects of feedback, Block diagram representation of physical systems, Mathematical models-differential Equations.

UNIT II: TRANSFER FUNCTION REPRESENTATION
Analogous systems, electrical analogy of physical systems, Derivation of transfer function, Transfer function of DC Servomotor, Synchro transmitter and receiver, Block diagram algebra, Signal Flow graph and Mason's gain formula.

UNIT III: TIME RESPONSE ANALYSIS
Types of test signals, Response of first and second order system, Time domain specifications, type and order of systems, steady state error, static error constants, generalized error co-efficients. Effect of P, PI, PID on time response.

UNIT IV: STABILITY ANALYSIS IN S-DOMAIN
Concepts of stability: Characteristic equation, location of roots in s-plane for stability, asymptotic stability and relative stability, Routh-Hurwitz stability criterion.
ROOT LOCUS TECHNIQUE: Root locus concept, construction of root loci, effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT V: FREQUENCY RESPONSE ANALYSIS
Introduction, Frequency domain specifications, Bode diagrams, Determination of Frequency domain specifications and transfer function from the Bode Diagram, Phase margin and Gain margin, Stability Analysis from Bode Plots.

UNIT VI: STABILITY ANALYSIS IN FREQUENCY DOMAIN
Polar Plots, Nyquist plots, stability in frequency domain using Nyquist stability criterion, simple problems.

UNIT VII: DESIGN AND COMPENSATION OF CONTROL SYSTEMS
Introduction to Compensation networks, Lag, Lead, lead-lag compensation, Compensation using Bode plots.

UNIT VIII: STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS
Concepts of state, state variables and state model, derivation of state model for physical systems Diagonalization, State Transition Matrix and its Properties, Solution of linear state equation, Concepts of Controllability and Observability, Kalman's test only.

TEXT BOOKS:
1. I. J. Nagrath and M. Gopal, *Control Systems Engineering,* 2nd Edition, New Age International (P) Limited.
2. Katsuhiko Ogata, *Modern Control Engineering,* 3rd Edition, Prentice Hall of India Pvt. Ltd.

REFERENCE BOOKS:
1. B.C.Kuo, *Automatic Control Systems*, Weilly Eastern, 2004.
2. John wiley, *Control Systems Engineering*, 3rd Edition, NISE.
3. Richard C. Dorf, Robert H. Bishop, *Modern Control Systems,* 11th Edition, Pearson Education, 2007.
4. Graham Goodwin, Stefan Graebe and Mario Salgado, *Control System Design,* Prentice Hall.

II B.Tech. II Semester

10BT40402: PULSE AND DIGITAL CIRCUITS

(Common to ECE, EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I: LINEAR WAVE SHAPING
High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High pass RC network as differentiator and Low pass RC network as integrator, attenuators and its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit. Problem solving.

UNIT-II: NON-LINEAR WAVE SHAPING
Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Synchronized clamping.

UNIT-III: SWITCHING CHARACTERISTICS OF DEVICES
Diode as a switch, piecewise linear diode characteristics, Diode switching times, Transistor as a switch, Break down voltages, transistor in saturation, temperature variations of saturation parameters, Transistor-switching times, Silicon-controlled-switch circuits.

UNIT-IV: MULTIVIBRATOR CIRCUITS
Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger Circuit using BJT, Concept of triggering, Symmetrical and asymmetrical configurations.

UNIT-V: TIME BASE GENERATORS
General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Transistor Current time base generators, Methods of linearity improvements.

UNIT-VI: SAMPLING GATES
Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Four Diode Sampling gate, Reduction of pedestal in gate circuits, Six diode gate, Applications of sampling gates.

UNIT-VII: SYNCHRONIZATION AND FREQUENCY DIVISION

Principles of Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit, A Sinusoidal Divider using Regeneration and Modulation.

UNIT-VIII: REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS

AND, OR & NOT gates using Diodes & Transistors, DCTL, RTL, DTL, TTL and CMOS Logic families, and Comparison between the logic families.

TEXT BOOKS:

1. J. Millman and H. Taub, *Pulse, Digital and Switching Waveforms*, McGraw-Hill, 1991.
2. David A. Bell, *Solid State Pulse circuits*, 4th Edition, PHI, 2002.
3. Jacob Milliman, Christors C Halkias, *Integrated Electronics,* 1st Edition, TMH, 2004.

REFERENCE BOOKS:

1. A. Anand Kumar, *Pulse and Digital Circuits*, 2nd Edition, PHI, 2005.
2. L. Strauss, *Wave Generation and Shaping*, 5th Edition, TMH, 2010.
3. R.Venkataraman, *Pulse, Digital Circuits and Computer Fundamentals*, 3rd Edition, Dhanapat Rai Publications, 2005.

II B.Tech. II Semester

10BT40403: ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

L	T	P	C
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Review of Coordinate Systems, Vector Calculus.

UNIT-I: **ELECTROSTATICS-I**
Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, illustrative Problems.

UNIT-II: **ELECTROSTATICS-II**
Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, illustrative Problems.

UNIT-III: MAGNETOSTATICS
Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy, illustrative Problems.

UNIT-IV: MAXWELL'S EQUATIONS (TIME VARYING FIELDS)
Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements. Conditions at a Boundary Surface: Dielectric-Dielectric and Dielectric-Conductor Interfaces, illustrative Problems.

UNIT-V: **EM WAVE CHARACTERISTICS – I**
Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization, illustrative Problems.

UNIT-VI: EM WAVE CHARACTERISTICS – II

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor, illustrative Problems.

UNIT-VII:TRANSMISSION LINES - I

Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion – Condition for Distortionless and Minimum Attenuation, Loading - Types of Loading, illustrative Problems.

UNIT-VIII: TRANSMISSION LINES – II

Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, UHF Lines as Circuit Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations. Significance of Z_{min} and Z_{max}, Smith Chart – Configuration and Applications, Single and Double Stub Matching, illustrative Problems.

TEXT BOOKS:

1. E.C. Jordan and K.G. Balmain, *Electromagnetic Waves and Radiating Systems*, 2nd Edition, PHI, 2000.
2. Matthew N.O. Sadiku, *Elements of Electromagnetic*, 3rd Edition, Oxford University Press, 2001.

REFERENCE BOOKS:

1. William H. Hayt Jr. and John A. Buck, *Engineering Electromagnetics*, 7th Edition, TMH, 2006.
2. John D. Ryder, *Networks, Lines and Fields*, 2nd Edition, PHI, 1999.
3. Nathan Ida, *Engineering Electromagnetics*, 2nd Edition, Springer (India) Pvt. Ltd., New Delhi, 2005.
4. Schaum's Out-lines, *Electromagnetics,* 2nd Edition, TMH, 2006.

II B.Tech. II Semester

10BT40404: SWITCHING THEORY AND LOGIC DESIGN

L	T	P	C
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UNIT-I: NUMBER SYSTEMS & CODES
Philosophy of number systems – complement representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

UNIT-II: BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS
Fundamental postulates of Boolean Algebra, Basic theorems and properties, switching functions, Canonical and Standard forms, algebraic simplification, digital logic gates, properties of XOR gate, universal gates, Multilevel NAND/NOR realizations.

UNIT-III: MINIMIZATION OF SWITCHING FUNCTIONS
Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, simplification rules.

UNIT-IV: COMBINATIONAL LOGIC DESIGN
Design using conventional logic gates-Binary Adders, Subtractors, Look ahead carry generator, Decimal adder-BCD adder, Binary multiplier, Modular design using IC chips-Magnitude comparator, Encoder, Decoder, Multiplexer- MUX Realization of switching functions, De-Multiplexer, Parity bit generator, Code-converters, Hazards and hazard free realizations.

UNIT-V: PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC
Basic PLD's-ROM, PROM, PLA, PAL, Realization of Switching functions using PLD's. Capabilities and limitations of Threshold gate, synthesis of threshold functions, multigate synthesis.

UNIT-VI: SEQUENTIAL CIRCUITS - I
Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples),Basic flip-flops, Triggering and excitation tables, Steps in synchronous sequential circuit design, Design of Synchronous counters – modulo-N, up/down counter, ring counter, Johnson counter, Design of Asynchronous counter-modulo-N , Sequence detector, Serial binary adder.

UNIT-VII: SEQUENTIAL CIRCUITS - II

Finite state machine-capabilities and limitations, Mealy and Moore models, minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods, concept of minimal cover table.

UNIT-VIII: ALGORITHMIC STATE MACHINES

Salient features of the ASM chart, Simple examples, System design using data path and control subsystems, control implementations, examples of Weighing machine and Binary multiplier.

TEXT BOOKS:

1. Morris Mano, *Digital Design,* 3rd Edition, PHI.
2. Zvi Kohavi, *Switching & Finite Automata theory,* 2nd Edition, TMH.

REFERENCE BOOKS:

1. Charles H. Roth, *Fundamentals of Logic Design*, 5th Edition, Thomson Publications, 2004.
2. Fletcher, *An Engineering Approach to Digital Design,* 1st Edition, PHI, 2005.
3. John M. Yarbrough, *Digital Logic Applications and Design,* Thomson Publications, 2006.
4. A Anand Kumar, *Switching Theory and Logic Design,* PHI, 2008.

II B.Tech. II Semester

10BT40221: PRINCIPLES OF ELECTRICAL ENGINEERING

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: TWO PORT NETWORKS

Impedance parameters, admittance parameters, hybrid parameters, transmission (ABCD) parameters, conversion of one parameter to another, conditions for reciprocity and symmetry, interconnection of two port networks in series, parallel and cascaded configurations, image parameters, illustrative problems.

UNIT-II: FILTERS

Classification of filters, filter networks, classification of pass band and stop band, characteristic impedance in the pass band & stop bands, constant-k Low pass filter, high pass filter, m-derived T-section, band pass filter and band elimination filter, illustrative problems.

UNIT-III: SYMMETRICAL ATTENUATORS

Symmetrical attenuators, T- type attenuator, $\prod$ - type attenuator, bridged T type attenuator, lattice attenuator.

UNIT-IV: DC MACHINES

Principle of operation of DC Machines- constructional features, EMF equation, Types of DC machines, Magnetization and load characteristics of DC generators, characteristics of DC motors, losses and efficiency, Swinburne's test, Speed control: flux and armature voltage control of DC shunt motor.

UNIT-V: POLY PHASE SYSTEM

Advantages of poly phase system over single phase system - phase sequence - star & delta connections, relationship between phase and line quantities, balanced and unbalanced circuits, power measurement in three phase systems using two wattmeter method - problems.

UNIT-VI: TRANSFORMERS AND THEIR PERFORMANCE

Principle of operation of single phase transformer, types , constructional features, phasor diagram on No load and load, equivalent circuit, losses and efficiency of transformer and regulation, OC and SC tests, predetermination of efficiency and regulation (simple problems).

UNIT-VII: THREE PHASE INDUCTION MOTORS AND ALTERNATORS

Principle of operation of three phase induction motors, slip ring and squirrel cage motors, alternators: constructional features, principle of operation, types, EMF equation (simple problems).

UNIT-VIII: SPECIAL MACHINES

Principle of operation - shaded pole motors, capacitor motors, AC servomotor, AC tachometers, synchros, stepper motor - characteristics.

TEXT BOOKS:

1. A. Sudhakar, Shyammohan S. Palli, *Network Analysis,* TMH, 3rd Edition, New Delhi, 2009.
2. B.L. Theraja and A.K. Theraja, *A Text Book Electrical Technology*, Vol - 2, S. Chand Company, New Delhi, 2010.

REFERENCE BOOKS:

1. John D. Ryder, *Networks, Lines and Fields*, 2nd edition, Prentice Hall India, New Delhi, 2009.
2. C.L. Wadhwa, *Network Analysis and Synthesis*,3rd Edition, NewAge International Publishers, 2007.
3. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering,* Oxford University Press, New Delhi, 2005.
4. W.H. Hayt and J.E. Kemmerly and S.M. Durbin, *Engineering Circuits Analysis*, 6th Edition, TMH, New Delhi, 2006.
5. M.S. Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering*, TMH, 2008.

II B.Tech. II Semester

10BT40411: ELECTRONIC CIRCUITS LAB

(Common to ECE & EIE)

L	T	P	C
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List of Experiments: (Minimum of Twelve experiments to be conducted)

I) Design and Simulation in Simulation Laboratory using Any Simulation Software.
(Minimum of Six Experiments to be conducted):

1. Common Emitter amplifier
2. Common Source amplifier
3. A Two Stage RC Coupled Amplifier
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. High Frequency Common base (BJT) / Common gate(JFET) Amplifier.

II) Testing in the Hardware Laboratory:

Any Three circuits simulations in Simulation laboratory

Any Three of the following

Class A Power Amplifier (with transformer load)

Class C Power Amplifier

Single Tuned Voltage Amplifier

Hartley and Colpitt's Oscillators

Darlington Pair

MOSFET Amplifier

II B.Tech. II Semester

10BT40231: ELECTRICAL ENGINEERING LAB

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

Any SIX experiments from each part to be conducted

PART - A

1. Series and parallel resonance - timing, resonant frequency, bandwidth and Q-factor determination for RLC network
2. Time response of first order RL/RC network for periodic non-sinusoidal inputs - time constant and steady state error determination
3. Two port network parameters - Z and Y parameters
4. Two port network parameters - ABCD and h-parameters
5. Verification of Superposition and Reciprocity theorems
6. Verification of maximum power transfer theorem. Verification on both DC and AC
7. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test
8. Constant - k low pass filter and high pass filter - design and test

PART - B

1. Magnetization characteristics of DC shunt generator. Determination of critical filed resistance
2. Swinburne's test on DC shunt machine (Predetermination of efficiency of a given DC shunt machine working as motor and generator)
3. Brake test on DC shunt motor. Determination of performance characteristics
4. Speed control of DC motor by
   a. Field flux control method
   b. Armature voltage control method
5. OC and SC tests on single-phase transformer (predetermination of efficiency and regulation at given power factors and determination of equivalent circuit)
6. Load test on single phase transformer
7. Brake test on three-phase induction motor. Determination of performance characteristics

II B.Tech. II Semester

10BT4HS02: ADVANCED ENGLISH COMMUNICATION SKILLS

(Common to ECE, EIE, EEE, EConE & BOT)

(Audit Course)

L	T	P	C
-	3	-	-

UNIT I: VOCABULARY BUILDING
Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.
FUNCTIONAL ENGLISH: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT II: READING COMPREHENSION
Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

UNIT III: ACADEMIC ESSAY WRITING
Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

UNIT IV: TECHNICAL REPORT WRITING
Types of formats and styles, Subject-matter, Subject-organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

UNIT V: CAREER SKILLS
Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.

UNIT VI: RESUME WRITING

Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

UNIT VII: GROUP DISCUSSION

Dynamics of group discussion, Intervention, Summarizing, Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

UNIT VIII: INTERVIEW SKILLS

Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, "Effective Technical Communication Skills". TMH, 2005.
2. Meenakshi Raman and Sangetha Sharma, "Technical Communication, Principles and Practice." Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, "Secrets of Success in Interviews". Crucial Books, Secunderabad, 2007.
4. M. Ashraf Rizvi, "Resumes and Interviews - The Art of Wining". TMH, 2008.
5. Gopala Swamy Ramesh and Mahadevan Ramesh, "The Ace of Soft Skills: Attitude, Communication and Etiquette for Success", Pearson Education, New Delhi, 2009.

SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.

III B.Tech. I Semester

10BT40501: COMPUTER ARCHITECTURE AND ORGANIZATION

(Common to ECE, EEE & EIE)

L	T	P	C
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UNIT I: STRUCTURE OF COMPUTERS
Computer Types, Functional Units, Basic Operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputers.
Computer Arithmetic: Review of Representation of Information, Addition and Subtraction, Multiplication and Division Algorithms, Floating-Point Arithmetic Operation, Decimal Arithmetic Unit, Decimal Arithmetic operations.

UNIT II: REGISTER TRANSFER AND MICRO-OPERATIONS
Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit, Instruction Codes, Computer Registers, Computer Instructions, Instruction Cycle, Timing and Control, Memory-Reference Instructions, Input-Output and Interrupt.
Central Processing Unit: Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). Comparison of RISC and CISC.

UNIT III: MICROPROGRAMMED CONTROL
Control Memory, Address Sequencing, Micro-program Example, Design of Control Unit, Hardwired Control, Micro-programmed Control, Nanoprogramming.

UNIT IV: PIPELINE AND VECTOR PROCESSING
Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data Path & Control Consideration, Superscalar Operations, Vector Processing, Array Processors.

UNIT V: THE MEMORY SYSTEM
Basic Concepts, Semiconductor RAM, Types of Read-only Memory (ROM), Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage, and Introduction to Redundant Array of Inexpensive Disks (RAID).

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA).

UNIT-VI: INPUT-OUTPUT ORGANIZATION (ADVANCED)
Input-Output Processor (IOP), Serial communication, Introduction to peripheral component Interconnect (PCI) bus, Introduction to Standard Serial Communication Protocols Like RS232, USB, and IEEE1394.

UNIT VII: MULTIPROCESSORS
Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Cache Coherance, Shared Memory Multiprocessors.

UNIT VIII: CASE STUDIES
CISC Architecture-Pentium IV, RISC Architecture-PowerPC.

TEXT BOOKS:

1. M. Moris Mano, *Computer System Architecture*, 3rd Edition, Pearson/PHI, 2008.
2. William Stallings, *Computer Organization and Architecture*, 6th Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, *Computer Organization*, 5th Edition, McGraw Hill, 2002.
2. Andrew S. Tanenbaum, *Structured Computer Organization*, 4th Edition, PHI/Pearson
3. Sivarama P. Dandamudi, *Fundamentals of Computer Organization and Design*, Springer International Edition, 2003.
4. John P. Hayes, *Computer Architecture and Organization*, 3rd Edition, TMH, 1998.

III B.Tech. I Semester

10BT50401: ANALOG COMMUNICATIONS

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION
Introduction to communication system, Need for modulation, Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves- square law Modulator, Switching modulator, Detection of AM Waves- Square law detector, Envelope detector.

UNIT-II: DSB MODULATION
Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSB-SC Waves- Balanced Modulators, Ring Modulator, Detection of DSB-SC Modulated waves- Coherent detector, COSTAS Loop

UNIT-III: SSB & VSB MODULATION
Frequency domain description, Frequency discrimination method for generation of AM SSB Modulated Wave, Time domain description, Phase discrimination method for generating AM SSB Modulated waves. Demodulation of SSB Waves, Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Time domain description, Envelope detection of a VSB Wave pulse Carrier, Comparison of AM Techniques, Applications of different AM Systems.

UNIT-IV: ANGLE MODULATION
Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Waves, Direct FM, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM & AM.

UNIT-V: NOISE
Noise in Analog communication System, Signal to Noise ratio in AM, DSB & SSB System, Signal to Noise ratio in Angle Modulation System, Threshold effect in Angle Modulation System, Pre-emphasis & De-emphasis.

UNIT-VI: TRANSMITTERS

Radio Transmitter - Classification of Transmitter, AM Transmitter, Effect of feed back on performance of AM Transmitter, FM Transmitter – Variable reactance type and phase modulated FM Transmitter, frequency stability in FM Transmitter.

UNIT-VII: RECEIVERS

Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.

UNIT-VIII: PULSE MODULATION

Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation & demodulation of PWM, PPM, Generation and demodulation of PPM.

MULTIPLEXING:Introduction to multiplexing, Time division multiplexing, Frequency division multiplexing.

TEXT BOOKS:

1. Simon Haykin, *Communication Systems*, 2nd Edition, John Wiley, 1978.
2. B.P. Lathi, *Communication Systems*, BS Publication, 2006.
3. George Kennedy and Bernard Davis, *Electronics & Communication System*, TMH, 2004.

REFERENCE BOOKS:

1. H Taub & D. Schilling, Gautam Sahe, *Principles of Communication Systems*, 3rd Edition, TMH, 2007.
2. R.P. Singh, SP Sapre, *Communication Systems*, 2nd Edition, TMH, 2007.
3. G.K. Mithal, *Radio Engineering*, 20th Edition, Khanna Publishers, 2003.

III B.Tech. I Semester

10BT50402: ANTENNAS AND WAVE PROPAGATION

L	T	P	C
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UNIT-I: ANTENNA BASICS
Introduction, Basic antenna parameters- patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity-Gain-Resolution, Antenna Apertures, Effective height, Illustrative problems. Fields from oscillating dipole, Field Zones, Shape-Impedance considerations, Antenna temperature, front–to-back ratio, antenna theorems, radiation- basic Maxwell's equations, retarded potential-Helmholtz Theorem.

UNIT-II: THIN LINEAR WIRE ANTENNAS
Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Field Components, Radiated power, Radiation Resistance, Beam width, Directivity, Effective Area and Effective Height. Natural current distributions, far fields and patterns of Thin Linear Center-fed Antennas of different lengths, Illustrative problems. Loop Antennas: Introduction, Small Loop, Comparison of far fields of small loop and short dipole, Radiation Resistances and Directives of small and large loops (Qualitative Treatment).

UNIT-III: ANTENNA ARRAYS
Point sources- Definition, Patterns, arrays of 2 Isotropic sources-Different cases. Principle of Pattern Multiplication, Uniform Linear Arrays – Broadside Arrays, Endfire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison, BSA with Non-uniform Amplitude Distribution - General considerations and Binomial Arrays, Illustrative problems.

UNIT-IV: VHF, UHF AND MICROWAVE ANTENNAS - I
Arrays with Parasitic Elements, Yagi - Uda Arrays, Folded Dipoles & their characteristics. Helical Antennas-Helical Geometry, Helix modes, Practical Design considerations for Monofilar Helical Antenna in Axial and Normal Modes. Horn Antennas- Types, Fermat's Principle, Optimum Horns, Design Considerations of Pyramidal Horns, Illustrative Problems.

UNIT-V: VHF, UHF AND MICROWAVE ANTENNAS - II

Microstrip Antennas- Introduction, features, advantages and limitations, Rectangular patch antennas- Geometry and parameters, characteristics of Microstrip antennas, Impact of different parameters on characteristics, reflector antennas- Introduction, Flat sheet and corner reflectors, paraboloidal reflectors- geometry, pattern characteristics, Feed Methods, Reflector Types- Related Features, Illustrative Problems.

UNIT-VI: LENS ANTENNAS

Introduction, Geometry of Non-metallic Dielectric Lenses, Zoning, Tolerances, Applications.

ANTENNA MEASUREMENTS: Introduction, Concepts- Reciprocity, Near and Far Fields, Coordination system, sources of errors, Patterns to be Measured, Pattern Measurement Arrangement, Directivity Measurement , Gain Measurements (by comparison, Absolute and 3-Antenna Methods).

UNIT-VII: WAVE PROPAGATION - I

Introduction, Definitions, Characterizations and general classifications, different modes of wave propagation, Ray/ Mode concepts. Ground wave propagation (Qualitative treatment)- Introduction, Plane earth reflections, Space and surface waves, wave tilt, curved earth reflections. Space wave propagation- Introduction, field strength variation with distance and height, effect of earth's curvature, absorption. Super refraction, M-curves and duct propagation, scattering phenomena, tropospheric propagation, fading and path loss calculations.

UNIT-VIII: WAVE PROPAGATION – II

Sky wave propagation- Introduction, structure of Ionosphere, refraction and reflection of sky waves by Ionosphere, Ray path, Critical frequency, MUF, LUF, OF, Virtual height and Skip distance, Relation between MUF and Skip distance, Multi-HOP propagation, Energy loss in Ionosphere, Summary of Wave Characteristics in different frequency ranges.

TEXT BOOKS:

1. John D. Kraus and Ronald J. Marhefka and Ahmad S.Khan, *Antennas and wave propagation,* 4th Edition (special Indian Edition), TMH, New Delhi, 2010.
2. E.C. Jordan and K.G. Balmain, *Electromagnetic Waves and Radiating Systems,* 2nd Edition, PHI, 2000.

REFERENCE BOOKS:

1. C.A. Balanis, *Antenna Theory*, 2nd Edition, John Wiley & Sons, 2001.
2. K.D. Prasad, Satya Prakashan, *Antennas and Wave Propagation*, Tech India Publications, New Delhi, 2001.
3. E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, *Transmission and Propagation*, vol.5, Standard Publishers Distributors, Delhi.
4. F.E. Terman, *Electronic and Radio Engineering*, 4th Edition, McGraw-Hill, 1955.
5. John D. Kraus, *Antennas*, 2nd Edition, McGraw-Hill (International Edition), 1988.

III B.Tech. I Semester

10BT50403: LINEAR IC APPLICATIONS

L	T	P	C
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UNIT-I: INTEGRATED CIRCUITS
Differential amplifier –DC and AC analysis of Dual input balanced output configuration, Properties of other differential amplifier configuration (dual input unbalanced output, single ended input-balanced/unbalanced output), DC coupling and cascade differential amplifier stages, Level Translator.

UNIT-II:
Characteristics of OP-Amps, integrated circuits-types, classification, package types and temperature ranges, power supplies, OP-Amp Block diagram, ideal and practical OP-Amp specifications, DC and AC characteristics, 741 OP-Amp and its features, FET input OP-Amps, OP-Amp parameters and measurement, input and output offset voltages and currents, slew rate, CMRR, PSRR, drift, Frequency compensation technique.

UNIT-III: LINEAR APPLICATIONS OF OPERATIONAL AMPLIFIER
Inverting and non-inverting amplifier, integrator and differentiator, difference amplifier, instrumentation amplifier, AC amplifier, V-I, I-V converters, Buffers.

UNIT-IV: NON - LINEAR APPLICATIONS OF OPERATIONAL AMPLIFIER
Non-linear function generation, comparators, Multivibrators, Triangular and square wave generators, Log and antilog amplifiers, precision rectifiers.

UNIT-V: ANALOG FILTERS
Introduction, Butterworth filters-first order, second order Low Pass, High Pass, Band pass, Band reject and all pass filters.

UNIT-VI: TIMERS AND PHASE LOCKED LOOPS
Introduction to 555 Timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger, PLL-Introduction, Block schematic, principles and description of individual blocks,565 PLL, applications of PLL-Frequency multiplication, frequency translation, AM, FM and FSK demodulators.

UNIT–VII: D/A AND A/D CONVERTERS
Introduction, Basic DAC techniques, weighted resistor DAC, R-2R Ladder DAC, Inverted R-2R DAC and IC 1408 DAC, different types of ADCs-parallel comparator type ADC, counter type ADC, successive approximation ADC and Dual slope ADC. DAC and ADC specifications, specifications of AD 574 (12 bit ADC).

UNIT-VIII: ANALOG MULTIPLIERS AND MODULATORS
Four quadrant multiplier, Balanced modulator, IC 1496, applications of analog switches and multiplexers, sample and hold amplifiers.

TEXT BOOKS:

1. Ramakanth A. Gayakwad, *Op-Amps & Linear ICs,* 2nd Edition, PHI, 1987.
2. D. Roy Chowdhury, *Linear Integrated Circuits,* 2nd Edition, New Age International (p) Ltd, 2003.

REFERENCE BOOKS:

1. David A. Bell, *Operational Amplifiers & Linear ICs,* 2nd Edition, Oxford University Press, 2010.
2. R.F.Coughlin & Fredrick Driscoll, *Operational Amplifiers & Linear Integrated Circuits,* 6th Edition, PHI, 2001.
3. Sergio Franco, *Design with Operational Amplifiers & Analog Integrated Circuits,* McGraw Hill, 1988.

III B.Tech. I Semester

10BT50404: DIGITAL IC APPLICATIONS

L	T	P	C
4	1	-	4

UNIT-I: CMOS LOGIC
Introduction to logic families, CMOS logic, CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families.

UNIT-II: BIPOLAR LOGIC AND INTERFACING
Bipolar logic, Transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs – Specifications.

UNIT-III: THE VHDL HARDWARE DESCRIPTION LANGUAGE
Design flow, program structure, types and constants, functions and procedures, libraries and packages.

UNIT-IV: THE VHDL DESIGN ELEMENTS
Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

UNIT-V: COMBINATIONAL LOGIC DESIGN
Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, Combinational multipliers. VHDL modes for the above ICs.

UNIT-VI: DESIGN EXAMPLES (USING VHDL)
Design examples (using VHDL) - Barrel shifter, comparators, floating-point encoder, dual parity encoder.

UNIT-VII: SEQUENTIAL LOGIC DESIGN
Latches and flip-flops, PLDs, counters, shift registers, and their VHDL models, synchronous design methodology, impediments to synchronous design.

UNIT-VIII: MEMORIES

ROM: Internal structure, 2D-decoding commercial types, timing and applications.

Static RAM: Internal structure, SRAM timing, standard SRAM, synchronous SRAM.

Dynamic RAM: Internal structure, timing, synchronous DRAM. Familiarity with Component Data Sheets – Cypress CY6116, CY7C1006, Specifications.

TEXT BOOKS:

1. John F. Wakerly, *Digital Design Principles & Practices,* 3rd Edition, PHI/ Pearson Education, Asia, 2005.
2. J. Bhasker, *A VHDL Primer*, 3rd Edition, Pearson Education/ PHI.

REFERENCE BOOKS:

1. Charles H. Roth Jr., *Digital System Design Using VHDL*, 2nd Edition, PWS Publications, 2008.
2. Stephen Borwn and Zvonko Vramesic, *Fundamentals of Digital Logic with VHDL Design*, 2nd Edition, McGraw Hill, 2005.

III B.Tech. I Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

(Common to ECE, CSSE & IT)

L	T	P	C
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UNIT-I: INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition, Nature and scope of managerial economics. Demand Analysis: Determinants of demand – Demand Function-Law of demand and its exceptions. Elasticity of demand. Types, Measurement and significance of Elasticity of demand. Demand forecasting and methods of demand forecasting.

UNIT-II: THEORY OF PRODUCTION AND COST ANALYSIS

Production Function: isoquants and isocosts. Input – output relationship. Law of returns, internal and external economies of scale. Cost Concepts: opportunity Vs out lay costs, Fixed Vs Variable costs, Explicit Vs implicit costs, out of pocket Vs inputted costs. Break Even Analysis (BEA), Determination of break even point (Simple problems).

UNIT-III: INTRODUCTION TO MARKETS AND PRICING

Market Structure: Types of Markets. Features of Perfect competition. Monopoly and Monopolistic competition. Price and Output determination in Perfect competition and Monopoly. Pricing: Objectives and policies of Pricing – Sealed bid pricing, Marginal cost pricing, Cost plus pricing, Going rate pricing, Limit Pricing, Market Penetration, Market Skimming, Block pricing, Bundling, Peak load pricing, Cross subsidization,Duel Pricing, Administrated pricing.

UNIT-IV: BUSINESS AND NEW ECONOMIC ENVIRONMENT

Characteristic features of Business, features and evolution of Sole proprietorship, Partnership, Joint stock Company, New Economic policy 1991.

UNIT-V: INTRODUCTION AND PRINCIPLES OF ACCOUNTING

Accountancy: Introduction – Concepts – Conventions – Accounting Principles - Double Entry Book Keeping, Journal, Ledger, Trail Balance (Simple Problems).

UNIT – VI: FINAL ACCOUNTS

Introduction to Final Accounts. Trading Account, Profit and Loss Account, and Balance Sheet with simple adjustments (Simple Problems).

UNIT – VII: CAPITAL AND CAPITAL BUDGETING

Capital: Significance, Types of capital. **Capital Budgeting:** Nature and scope of capital budgeting. Features and Methods of capital budgeting. Pay Back Period Method, Accounting Rate of Return Method, Internal Rate of Return Method, Net present Value Method and Profitability Index (Simple Problems).

UNIT – VIII: COMPUTERIZATION OF ACCOUNTANCY SYSTEM

Manual Accounting Vs Computerized Accounting – Advantages and Disadvantages of Computerized Accounting – Using Accounting Software. Tally: Tally features – Company Creation – Account Groups – Group Creation – Ledger Creation**.**

TEXT BOOKS:

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3rd Edition, TMH, 2007.
2. R. Cauvery, U.K.Sudhanayak, M.Girija and R. Meenakshi, *Managerial Economics,* 1st Edition, S.Chand and company, New Delhi, 1997.

REFERENCE BOOKS:

1. Ms. Samba Lalita, *Computer Accounting Lab Work*, 1st Edition, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19th Edition Sultan Chand and Sons, New Delhi, 2005.
3. H.Craig Petersen and W.Cris Levis, *Managerial Economics*, 4th Edition, Pearson Education, 2009.
4. Lipsy and Chrystel, *Economics,* 4th edition,Oxford University Press, New Delhi, 2008.
5. S.N.Maheswari and S.K.Maheswari, *Financial Accounting,* 4th Edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting,* 5th Edition, Kalyani Publishers, Ludhiana, 2000.

III B.Tech. I Semester

10BT50411: ANALOG COMMUNICATIONS LAB

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Minimum Twelve experiments to be conducted:

1. Amplitude modulation and demodulation.
2. Diode detector characteristics.
3. Frequency modulation and demodulation.
4. Balanced modulator.
5. Pre-emphasis & de-emphasis.
6. Characteristics of mixer.
7. Digital Phase detector.
8. Phase locked loop.
9. Synchronous detector.
10. SSB system.
11. Spectral analysis of AM and FM signals using spectrum analyzer.
12. Squelch Circuit.
13. Frequency Synthesizer.
14. AGC Characteristics.

III B.Tech. I Semester

10BT50412: PULSE AND DIGITAL CIRCUITS LAB

L	T	P	C
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List of Experiments: (Minimum of twelve experiments to be conducted)

PART – A

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers and Clampers.
3. Transistor as a switch.
4. Sampling Gates.
5. Schmitt Trigger.
6. UJT Relaxation Oscillator.
7. Bootstrap sweep circuit.
8. Constant Current Sweep Generator using BJT.
9. Study of Logic Gates & Some applications.
10. Study of Flip-Flops & some applications.

PART – B (Design aspects to be included)

1. Bistable Multivibrator.
2. Monostable Multivibrator.
3. Astable Multivibrator.

III B.Tech. II Semester

10BT6HS01: MANAGEMENT SCIENCE

(Common to ECE & BOT)

L	T	P	C
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UNIT-I: INTRODUCTION TO MANAGEMENT
Concepts of management and organization - Nature and Importance of management - Evolution of management thought - Functions of management - Contributions of F.W. Taylor and Henri Fayol to the management - Systems approach to management - Managerial skills - Elements of corporate planning process - Environmental scanning - SWOT Analysis - Social responsibilities of management.

UNIT-II: DESIGNING ORGANIZATIONAL STRUCTURES
Basic concepts related to organization - Departmentation and decentralization - Types of organizations - Merits, demerits and adoptability to modern firms.

UNIT-III: OPERATIONS MANAGEMENT
Principles and types of plant layout - Methods of production - Forecasting - Forecasting methods - Work study - Basic procedure involved in method study and work measurement - Statistical quality control: Factors affecting quality - Quality control using control charts (simple problems) - Acceptance sampling.

UNIT-IV: MATERIALS MANAGEMENT
Materials management objectives - Inventory - Types of inventory - Safety stock - Classical EOQ model - Need for inventory control - EOQ simple problems - ABC analysis - Purchase procedure - Stores management.
MARKETING: Functions of marketing - Marketing mix - Channels of distribution.

UNIT-V: HUMAN RESOURCES MANAGEMENT (HRM)
Nature and scope of HRM - HRD and personnel management and industrial relations - Functions of HRM - Role of HR Manager in an organization - Performance appraisal - Job evaluation and merit rating - Motivation - Importance of motivation - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

UNIT-VI: PROJECT MANAGEMENT (PERT/CPM)
Network analysis - Program evaluation and review technique (PERT) - Critical path method (CPM) - Identifying critical path - Probability of completing the project within given time - Project cost analysis - Project crashing (simple problems).

UNIT- VII: ENTREPRENEURSHIP
Introduction to entrepreneurship - Definition of an entrepreneur - Entrepreneurial traits - Entrepreneur vs. manager - Entrepreneurial decision process - Role of entrepreneurship in economic development - Social responsibilities of entrepreneurs - Opportunities for entrepreneurs in India and abroad - Women as an entrepreneur.

UNIT-VIII: CONTEMPORARY MANAGEMENT PRACTICES
Basic concepts of Just-In-Time (JIT) system - Total quality management (TQM) - Value chain analysis - Enterprise resource planning (ERP) - Business process outsourcing (BPO) - Globalization-Management challenges - Intellectual property rights - Supply chain management - Role of information technology in managerial decision making.

TEXT BOOKS:

1. O.P. Khanna, *Industrial Engineering and Management*, Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management*, 6th Edition, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement*, 12th Edition, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6th Edition, TMH, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2nd Edition, TMH, New Delhi.
4. Heinz Weihrich and Harold Koontz, *Management- A Global Perspective*, 10th Edition, McGraw-Hill International.

III B.Tech. II Semester

10BT60401: DIGITAL SIGNAL PROCESSING

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
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UNIT-I: INTRODUCTION TO DIGITAL SIGNAL PROCESSING
Discrete-time signals and sequences, Linear shift invariant systems, Stability and Causality, Linear constant coefficient difference equations. Frequency domain representation of discrete-time signals and systems.

UNIT-II: DISCRETE FOURIER SERIES
DFS representation of periodic sequences, properties of Discrete Fourier Series. Discrete Fourier Transforms: properties of DFT, Linear convolution of sequences using DFT, Computation of DFT. Relation between Z-Transforms and DFS.

UNIT-III: FAST FOURIER TRANSFORMS
Fast Fourier transforms (FFT): Radix-2 Decimation in time (DIT) and Decimation in frequency (DIF), FFT algorithms, Inverse FFT and FFT for composite N.

UNIT-IV: REALIZATION OF DIGITAL FILTERS
Review of Z-transforms, Applications of Z-Transforms, Solution for difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations. Basic structures of IIR systems, Transposed forms. Basic structures of FIR systems, System function.

UNIT-V: IIR DIGITAL FILTERS
Introduction to analog and digital filters, Analog filter approximations-Butterworth and chebyshev, Design of IIR digital filters from analog filters, Design examples: analog-digital transformations.

UNIT-VI: FIR DIGITAL FILTERS
Characteristics of FIR digital filters, Frequency response. Design of FIR digital filters using windowing techniques, Frequency sampling technique, Comparison of IIR and FIR filters.

UNIT-VII: MULTIRATE DIGITAL SIGNAL PROCESSING FUNDAMENTALS

Basic sample rate alteration devices, Decimation, Interpolation, Sampling rate conversion, Implementation of sampling rate conversion, Multistage design of decimator and Interpolator.

UNIT-VIII: APPLICATIONS OF DIGITAL SIGNAL PROCESSING

Spectral analysis of nonstationary Signals, Musical sound processing, Signal Compression, Transmultiplexers, Discrete multitone transmission of digital data.

TEXT BOOKS:

1. John G. Proakis, Dimitris G. Manolakis, *Digital signal processing, principles, Algorithms and applications,* 4th Edition, Pearson Education/PHI, 2007.
2. A.V. Oppenheim and R.W. Schaffer, *Discrete Time Signal Processing,* 2nd Edition, PHI, 2006.
3. Sanjit K Mitra, *Digital signal processing, A computer base approach,* 3rd Edition, TMH, 2009.

REFERENCE BOOKS:

1. S Salivahana, A Vallavaraj, C Gnanapriya, *Digital Signal Processing,* TMH, 2005.
2. Andreas Antoniou, *Digital signal processing,* TMH, 2006.

III B.Tech. II Semester

10BT60402: DIGITAL COMMUNICATIONS

L	T	P	C
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UNIT-I: PULSE DIGITAL MODULATION
Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error, Compading in PCM systems, Electrical Representation of binary signals, Differential PCM systems (DPCM).

UNIT-II: DELTA MODULATION
Delta modulation and its drawbacks, Adaptive Delta modulation, comparison of PCM and DM systems, SNR in PCM and DM systems.

UNIT-III: DIGITAL MODULATION TECHNIQUES
Introduction, ASK, FSK, PSK, DPSK, DEPSK, QPSK, M-ary schemes: PSK, ASK, FSK. Similarity of BFSK and BPSK.

UNIT-IV: DATA TRANSMISSION
Base band signal receiver, probability of error, the optimum filter, White noise: matched filter, probability of error using matched filter, coherent reception: correlation, non-coherent detection of FSK, calculation of error probability of ASK, BPSK, BFSK, QPSK.

UNIT-V: INFORMATION THEORY
Discrete messages, concept of amount of information and its properties. Average information, Entropy and its properties. Information rate, Mutual information and its properties.

UNIT-VI: SOURCE CODING
Introduction, Advantages, Shannon's theorem, Shanon-Fano coding, Huffman coding, efficiency calculations, channel capacity of discrete and analog Channels, capacity of a Gaussian channel, bandwidth – S/N trade off.

UNIT-VII: LINEAR BLOCK CODES
Introduction, Matrix description of Linear Block codes, Error detection and error correction capabilities of Linear block codes, Hamming codes, Binary cyclic codes, Algebraic structure, encoding, syndrome calculation, BCH Codes.

UNIT-VIII: CONVOLUTIONAL CODES
Introduction, encoding of convolutional codes, time domain approach, transform domain approach. Graphical approach: state, tree and trellis diagram decoding using Viterbi algorithm.

TEXT BOOKS:

1. H. Taub and D. Schilling, *Principles of Communication Systems,* 2nd Edition, TMH, 2003.
2. Simon Haykin, *Digital communications,* John Wiley, 2005.
3. B.P.Lathi, *Modern Analog and Digital Communication,* 3rd Edition, Oxford reprint, 2004.

REFERENCE BOOKS:

1. R.P. Singh and S D Sapre, *Communication Systems Analog and Digital,* 2nd Edition, TMH, 2004.
2. Sam Shanmugam, *Digital and Analog Communication Systems,* John Wiley, 2005.
3. John Proakis, *Digital Communications,* 3rd Edition, TMH, 1983.
4. Bernard Sklar, Pabitra Kumar Ray, *Digital Communications Fundamentals and Applications,* 2nd Edition, Pearson Education, 2001.

III B.Tech. II Semester

10BT60403: MICROWAVE ENGINEERING

L	T	P	C
4	1	-	4

UNIT-I: MICROWAVE TRANSMISSION LINES - I
Introduction, Microwave spectrum and bands, applications of Microwaves. Rectangular Waveguides-Solution of Wave Equation in Rectangular Coordinates, TE and TM mode analysis, Expressions for fields, Characteristic equation and cutoff frequencies, filter characteristics, dominant and degenerate modes, sketches of TE and TM mode fields in the cross section. Mode characteristics - Phase and Group velocities, wavelengths and impedance relations, Illustrative Problems.

UNIT-II: MICROWAVE TRANSMISSION LINES - II
Rectangular Waveguides – Power Transmission and Power Losses, Impossibility of TEM Modes, Micro strip lines-introduction, Z_0 relations, effective dielectric constant, losses, Q-factor, Cavity resonators-introduction, Rectangular cavities, dominant modes and resonant frequencies, Q-factor and coupling coefficients, Illustrative Problems.

UNIT-III: WAVEGUIDE COMPONENTS AND APPLICATIONS- I
Coupling mechanisms- probe, loop, aperture types. Waveguide discontinuities - waveguide Windows, tuning screws and posts, matched loads. Waveguide attenuators - resistive card, rotary vane Attenuators, waveguide phase shifters-dielectric, rotary vane phase shifters. Waveguide multiport junctions-E plane and H plane Tees, Magic Tee, Directional couplers-2 hole, Bath hole types, Illustrative Problems.

UNIT-IV: WAVEGUIDE COMPONENTS AND APPLICATIONS-II
Ferrites-composition and characteristics, Faraday rotation, Ferrite components-Gyrator, Isolator and Circulator. Scattering Matrix-Significance, Formulation and properties. S Matrix calculations for 2-port junction, E plane and H plane Tees, Magic Tee, Directional coupler, circulator and Isolator, Illustrative Problems.

UNIT-V: MICROWAVE TUBES-I

Limitations and losses of conventional tubes at microwave frequencies. Microwave tubes-O type and M type classifications.

O TYPE TUBES: 2 cavity klystrons-structure, Reentrant cavities, velocity modulation process and Applegate diagram, bunching process and small signal theory-Expressions for O/P power and efficiency. Reflex Klystrons-structure, Velocity Modulation, Applegate diagram, mathematical theory of bunching, power output, efficiency, oscillating modes and O/P characteristics, Effect of Repeller Voltage on Power O/P, Illustrative Problems.

UNIT-VI: MICROWAVE TUBES-II

HELIX TWTs: Significance, types and characteristics of slow wave structures; structure of TWT and amplification process (qualitative treatment), suppression of oscillations, gain considerations.

M -TYPE TUBES: Introduction, cross field effects, Magnetrons-different types, cylindrical travelling wave magnetron-Hull cutoff and Hartree conditions, modes of resonance and PI-mode operation, separation of PI-mode, O/P characteristics, Illustrative Problems.

UNIT-VII: MICROWAVE SOLID STATE DEVICES

Introduction, classification, applications, Transfer Electronic Devices, Gunn diode - principles, RWH theory, characteristics, basic modes of operation - Gunn oscillation modes. LSA Mode, Varactor Diode, Parametric Amplifier, Introduction to Avalanche Transit time devices (brief treatment only).

UNIT-VIII: MICROWAVE MEASUREMENTS

Description of Microwave bench-different blocks and their features, errors and precautions; Microwave power measurement-Bolometer method, Measurement of attenuation, frequency, low and high VSWR, Q of the cavity and impedance measurements.

TEXT BOOKS:

1. Samuel Y. Liao, *Microwave devices and circuits*, 3rd Edition, Pearson Education, 2003.
2. Herbert J.Reich, J.G.Skalnik, P.F.Ordung and H.L.Krauss, *Microwave principles*, CBS publishers and distributors, New Delhi, 2004.

REFERENCE BOOKS:

1. R. E. Collin, *Foundations for Microwave Engineering,* 2nd Edition, IEEE Press, John Wiley, 2002.
2. M. L. Sisodia and G. S. Raghuvanshi, *Microwave circuits and Passive Devices*, Wiley Eastern Ltd., New Age International Publishers Ltd., 1995.
3. Peter A. Rizzi, *Microwave Engineering Passive Circuits*, PHI, 1999.
4. F. E. Terman, *Electronic and Radio Engineering*, 4th Edition, McGraw-Hill, 1995.
5. A. Das, *Microwave Engineering*, 2nd Edition, TMH, 2009.

III B.Tech. II Semester

10BT60404: MICROPROCESSORS AND MICROCONTROLLERS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: 8085 ARCHITECTURE
Microprocessor evolution and types, introduction to 8085 architecture, register organization, pin description, instruction set (briefly), simple programs, interrupts of 8085, interfacing I/O devices using memory mapped I/O and I/O mapped I/O.

UNIT-II: 8086 ARCHITECTURE
Architecture of 8086 microprocessor, register organization, special functions of general purpose registers, memory segmentation, pin description, minimum and maximum mode operation of 8086, timing diagram.

UNIT-III: 8086 INSTRUCTION SET AND ASSEMBLER DIRECTIVES
Machine language instruction formats, addressing modes, instruction set of 8086, assembler directives, simple programs - procedures and macros.

UNIT-IV: PROGRAMMABLE INTERFACING DEVICES
Types of data communication, serial and parallel, methods of parallel data transfer, 8255A (programmable peripheral interface) internal block diagram, operational modes and initialization, interface of I/O devices: A/D, D/A, key board, stepper motor.

UNIT-V: SERIAL DATA COMMUNICATION
Types of serial data transmission, synchronous and asynchronous, 8251 (USART), simple programs for sending and receiving characters with an 8251 (polling & interrupt basis), serial communication standard, RS232C, RS232C to TTL and TTL to RS232C conversion, USB.

UNIT-VI: INTERFACING WITH ADVANCED DEVICES
Memory (static RAM and EPROM) and I/O interfacing with 8086, 8257 (DMA controller), interrupt structure, interrupt vector table, 8259 Programmable Interrupt Controller (PIC), importance of cascading of PICs.

UNIT-VII: 8051 MICROCONTROLLER

Architecture of 8051 microcontroller, internal and external memories, addressing modes and instruction set of 8051, simple programs using 8051.

UNIT-VIII: 8051 INTERRUPTS, COMMUNICATION AND APPLICATIONS

Interrupts, timers/counters and serial communication, programming of interrupts, timers/counters and serial communication interrupts. Interfacing LEDs, seven segment display.

TEXT BOOKS:

1. Douglas V.Hall, *Microprocessors and Interfacing: Programming and Hardware,* revised 2nd edition, TMH.
2. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems*, PHI, 2000.

REFERENCE BOOKS:

1. Ramesh S. Goankar, *Microprocessor- Architecture, Programming and Applications with the 8085*, 5th edition, Penram International publishing private limited.
2. A.K. Ray & K.M.Bhurchandi, A*dvanced Microprocessors and Peripherals- Architecture, Programming and Interfacing,* TMH, 2002 reprint.
3. Yu-cheng Liu, Glenn A. Gibson, *Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design,* PHI, 2006.

III B.Tech. II Semester

10BT60405: VLSI DESIGN

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION
Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT-II: BASIC ELECTRICAL PROPERTIES
Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, figure of merit, Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT-III: VLSI CIRCUIT DESIGN PROCESSES
VLSI design flow, MOS layers, Stick diagrams, Design rules and Layout, 2 micron CMOS design rules for Wires, Contacts and Transistors, Layout diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

UNIT-IV: GATE LEVEL DESIGN
Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance R_S and its concept to MOS, Area Capacitance Units, Calculations - Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT-V: SUBSYSTEM DESIGN
Adders – Transmission based Adder, Carry Bypass Adder, Carry Skip Adder, Carry Select Adder, Shifters- Barrel Shifter, Logarithmic Shifter, Multipliers – Definitions, Array Multiplier, Carry Save multiplier, Booth Multiplier, ALUs, Parity generators, Comparators, Zero/One Detectors, Counters- Synchronous & Asynchronous Counter, High Density Memory Elements.

UNIT-VI: SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN
PLAs, FPGAs, CPLDs, PALs, Cell based Design Methodology, Design Approach.

UNIT-VII: VHDL SYNTHESIS

VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Types of Simulation, Layout Synthesis, Design capture tools, Design Verification Tools.

UNIT-VIII: CMOS TESTING

CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, *Essentials of VLSI Circuits and Systems,* PHI, 2005 Edition.
2. Weste and EShraghian, *Principles of CMOS VLSI Design,* Pearson Education, 1999.

REFERENCE BOOKS:

1. John M. Rabaey, *Digital Integrated Circuits: A Design Perspective,* 2nd Edition, PHI, EEE, 1997.
2. Wayne wolf, *Modern VLSI Design,* 3rd Edition, Pearson Education, 1997.
3. Charles H. Roth, *Fundamentals of Logic Design,* 5th Edition, Thomson Publications, 2004.

III B.Tech. II Semester

10BT60411: MICROPROCESSORS AND MICROCONTROLLERS LAB

(Common to ECE, EIE & EConE)

L	T	P	C
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Any **TWELVE** experiments to be conducted

I Programs using 8085

1. Arithmetic operations
2. Logical operations

II Programs using 8086

1. Introduction to MASM/TASM
2. Arithmetic operations
3. Logic operations
4. String operations
5. Modular program: use procedure

III Interfacing Programs with 8086

1. Stepper motor
2. Logic controllers
3. A/D and D/A converter
4. Seven segment display
5. Keyboard interfacing

IV Programs using 8051

1. Arithmetic operations
2. Addition operation using external memory
3. Programs using special instructions like SWAP, bit/byte, set/ reset etc.

III B.Tech. II Semester

10BT60412: IC APPLICATIONS AND ECAD LAB

L	T	P	C
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Minimum Twelve Experiments to be conducted:

Part A (IC Application Lab): (Minimum Six experiments to be conducted)

1. OP AMP Applications – Adder, Subtractor, Comparator Circuits.
2. Active Filter Applications – LPF, HPF (First & Second order).
3. Function Generator using OP AMPs.
4. IC 555 Timer – Monostable and Astable Operation Circuit.
5. IC 566 – VCO Applications.
6. Voltage Regulator using IC 723.
7. 4 bit ADC & DAC.
8. Precision rectifier using OP Amp.

Part B (ECAD Lab): (Minimum Six experiments to be conducted)

Simulate the internal structure of the following Digital IC's using VHDL and verify the operations of the Digital IC's (Hardware) in the Laboratory

1. Logic Gates- 74XX.
2. Half Adder, Half Subtractor, Full Adder, Full Subtractor & Ripple Carry Adder.
3. 3-8 Decoder -74X138 & 8-3 Encoder- 74X148.
4. 8 x 1 Multiplexer -74X151 and 2x4 Demultiplexer-74X155.
5. 4 bit Comparator-74X85.
6. D Flip-Flop 74X74 and JK Flip-Flop 74X109.
7. Decade counter-74X90.
8. Universal shift register -74X194
9. RAM(16x4)-74189.

IV B.Tech. I Semester

10BT70401: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

L	T	P	C
4	1	-	4

UNIT-I: PERFORMANCE CHARACTERISTICS OF INSTRUMENTS
Static characteristics, Accuracy, Precision, Resolution, Sensitivity, Errors in measurement, Dynamic Characteristics-speed of response, fidelity, lag and dynamic error, Statistical Analysis.
INDICATORS: Basic meter movement, DC voltmeters-multirange, range extension, Loading, Transistor Voltmeter, Solid State Voltmeter, AC voltmeters –using rectifiers, Multirange, range extension, Ammeters- Multirange, Universal Shunt, Extending Ranges, Thermocouple type RF ammeter, ohmmeters, series type and shunt type, Calibration of DC Instrument & Ohmmeter, Multimeter for Voltage, Current and Resistance measurements.

UNIT-II: SIGNAL GENERATORS
Fixed and Variable AF oscillators, Standard Signal Generator, AF Sine & Square wave Generator, Function Generators-Square & Pulse, Random noise, Sweep, and Arbitrary waveform generators specifications and principles of working (Block diagram approach).

UNIT-III: ANALYZERS
Wave analyzers, Harmonic distortion analyzers, Spectrum analyzers, Digital Fourier analyzers, and Logic analyzers.

UNIT-IV: OSCILLOSCOPES
Standard specifications of CRO, CRT features, Vertical and Horizontal amplifiers, Horizontal and Vertical deflection systems, triggered sweep CRO, and Delayed sweep, sync selector circuits, probes for CRO – active, passive, and attenuator type, Dual Beam & Trace CRO, Measurement of amplitude, frequency and phase (Lissajous method).

UNIT-V: OSCILLOSCOPE TYPES
Sampling oscilloscope, Storage oscilloscope, Digital readout Oscilloscope, Digital storage oscilloscope, Digital frequency counter, time and phase measurement.

UNIT-VI:
DC BRIDGES: Wheatstone bridge, Wein bridge.
AC BRIDGES: Maxwell's bridge, Anderson bridge. Measurement of capacitance- Schearing bridge. Kelvin bridge, Errors and precautions in using bridges. Q-meter, EMI and EMC, Interference and noise reduction techniques.

UNIT-VII: SENSORS AND TRANSDUCERS
Active and passive transducers: Measurement of displacement (Resistance, capacitance, inductance; LVDT) Force (strain gauges) Pressure (piezoelectric transducers) Temperature (resistance thermometers, thermocouples, and Thermistors), Velocity, Acceleration, Vibration, pH measurement.

UNIT-VIII: DATA ACQUISITION SYSTEM
Generalized Data Acquisition System, Signal Conditioning, Single & Multi Channel DAS.
COMPUTER CONTROLLED TEST SYSTEMS: Testing an Audio Amplifier, Testing a Radio Receiver, Instruments used in Computer Controlled Instrumentation.

TEXT BOOKS:

1. H.S.Kalsi, *Electronic instrumentation,* 2nd Edition, TMH, 2004.
2. A.D. Helfrick and W.D. Cooper, *Modern Electronic Instrumentation and Measurement Techniques,* 5th Edition, PHI, 2002.
3. David A. Bell, *Electronic Instrumentation & Measurements,* 2nd Edition, PHI, 2003.

REFERENCE BOOKS:

1. Ernest O Doebelin and Dhanesh N Manik, *Measurement Systems Application and Design,* 5th Edition, TMH, 2009.
2. Oliver and Cage, *Electronic Measurement and Instrumentation,* TMH.
3. Robert A.Witte, *Electronic Test Instruments, Analog and Digital Measurements,* 2nd Edition, Pearson Education, 2004.
4. K. Lal Kishore, *Electronic Measurements & Instrumentations,* Pearson Education, 2005.

IV B.Tech. I Semester

10BT61202: COMPUTER NETWORKS

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT I: INTRODUCTION
Network Applications, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Example Networks: Novell Network, X.25, Internet.

UNIT II: THE PHYSICAL LAYER
Theoretical Basis for communication, Guided Transmission media, Wireless Transmission, The public switched telephone Networks, Mobile telephone system.

UNIT III: THE DATA LINK LAYER
Design Issues, Error detection and correction-CRC, Hamming codes, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols: HDLC, The Data Link Layer in the Internet.

UNIT IV: THE MEDIUM ACCESS SUBLAYER
Channel Allocations problem, Multiple Access protocols: ALOHA, CSMA, CSMA/CD protocols, Collision free protocols, Limited contention protocols, Ethernet, DLL Switching.

UNIT V: THE NETWORK LAYER
Network Layer Design Issues, Routing Algorithms: Shortest path, Flooding, Distance vector, Hierarchical, Broadcast and Multicast, Congestion Control Algorithms, Internetworking, The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, Ipv6 Main Header.

UNIT VI: THE TRANSPORT LAYER
Transport Service, Elements of transport protocol, Internet Transport layer protocols: UDP and TCP.

UNIT VII: THE APPLICATION LAYER
DNS: The Domain name system, Electronic Mail, World Wide Web: Architectural Overview, Dynamic Web Document, HTTP.

UNIT VIII: IEEE STANDARDS AND NETWORK SECURITY
Introduction to IEEE standards, Wi-Fi: 802.11b, Bluetooth: 802.15, 3G: 802.16, 4G: 802.16m, Wi-Max: 802.16a.
Introduction to Network Security: Cryptography - Substitution Techniques, Transposition Techniques.

TEXT BOOKS:

1. A.S. Tanenbaum, *Computer Networks*, 4th Edition, Pearson Education/ PHI.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, *Data communication and Networking*, TMH, 2004.
2. Peterson and Davie, *Computer Networks*, 2nd Edition, Morgan Kaufmann.
3. Kurose, Ross, *Computer Networking*, Pearson Education, 2010.
4. Leon-Garcia and Widjaja, *Communication Networks*, 2nd Edition, TMH.
5. S.Keshay, *An Engg. Approach to Computer Networking*, Addison Wesley, 1997.

IV B.Tech. I Semester

10BT40502: OBJECT ORIENTED PROGRAMMING

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

Need for OOP paradigm, OOP concepts, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions. C++ class overview-class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

UNIT-II: POLYMORPHISM AND INHERITANCE

Function overloading, operator overloading, generic programming-function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, abstract classes, Streams.

UNIT-III: BASICS OF JAVA

History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT-IV: INHERITANCE AND INTERFACES

Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes. Interfaces: differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-V: EXCEPTION HANDLING

Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages,

Exception handling: Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

UNIT-VI:MULTITHREADING AND APPLETS

Differences between multithreading and multitasking, thread life cycle, creating threads, synchronizing threads. Applets: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets ,Graphics class.

UNIT-VII: EVENT HANDLING

Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, dialogs, menu bar, graphics, layout manager – boarder, grid, flow, card and grid bag.

UNIT-VIII: SWINGS

Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing – Japplet, JFrame and JComponent, Icons and labels, text fields, The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Robert Lafore, *Waite Group's Object-Oriented Programming in C++,* 3rd Edition, 2007.
2. Herbert schildt, *Java- the complete reference*, 7th editon, 5th Reprint, TMH, 2008.

REFERENCE BOOKS:

1. Y. Daniel Liang, *Introduction to Java programming,* 6th edition, Pearson Education.
2. Cay.S.Horstmann and Gary Cornell, *Core Java 2,* Vol 1, 7th Edition, Pearson Education.
3. S.B.Lippman, *C++ primer*, 3rd Edition, Pearson Education.
4. W.Savitch, *Problem solving with C++*, *The OOP*, 4th edition, Pearson Education.
5. B. Stroustrup, *The C++ Programming Language*, 3rd edition, Pearson Education

IV B.Tech. I Semester

10BT70402: DIGITAL IMAGE PROCESSING

(Common to ECE, EIE & IT)

L	T	P	C
4	1	-	4

UNIT-I: DIGITAL IMAGE FUNDAMENTALS
Image sensing and acquisition, Image sampling & quantization, some basic relationships between pixels. Mathematical tools used in digital image processing – array Vs matrix operations, linear Vs non linear operations, Arithmetic operations, Set and Logical operations, Spatial operations, vector and matrix operations, Probabilistic methods.

UNIT-II: IMAGE TRANSFORMS
2D-DFT and properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar-Transform, Slant Transform, Hotelling Transform.

UNIT-III: IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN
Basic Intensity transformation functions, Histogram processing, Fundamentals of Spatial Filtering, Smoothing spatial filters, Sharpening spatial filters, Combining spatial Enhancement methods.

UNIT-IV: IMAGE ENHANCEMENT IN FREQUENCY DOMAIN
Basics of filtering in frequency domain, Correspondence between filtering in the spatial and frequency domains, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters, Homomorphic filtering.

UNIT-V: IMAGE RESTORATION
Noise models, Restoration in the presence of Noise only-spatial filtering - mean, order- statistic and adaptive filters, Estimating the degradation function, Inverse filtering, Weiner filtering, Constrained least squares filtering.

UNIT-VI: IMAGE SEGMENTATION
Point, line and edge Detection, Thresholding, Region based Segmentation, The use of motion in Segmentation.

UNIT-VII: IMAGE COMPRESSION

Need for Image Compression, Classification of redundancy in Images, Image Compression models, Classification of image compression schemes, Run length coding, Arithmetic coding, Block truncation coding, Dictionary based compression, Transform based compression, Image compression standards.

UNIT-VIII: COLOR IMAGE PROCESSING

Color models, Pseudo color image processing, Color transformations, Smoothing and Sharpening, Image segmentation based on color.

TEXT BOOKS:

1. R. C .Gonzalez & R.E. Woods, *Digital Image Processing,* 2nd Edition, Addison Wesley/Pearson Education, 2002.
2. Malay K. Pakhira, *Digital Image processing and Pattern Recognition,* PHI, 2011.

REFERENCE BOOKS:

1. Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, *Digital Image processing using MATLAB,* TMH, 2010.
2. S jayaraman, S Esakkirajan, T Veerakumar, *Digital Image processing,* TMH.
3. A .K. Jain, *Fundamentals of Digital Image processing,* PHI.

IV B.Tech. I Semester

10BT70403: SPREAD SPECTRUM COMMUNICATIONS

(Elective - I)

L	T	P	C
4	-	-	4

UNIT-I: FUNDAMENTALS OF SPREAD SPECTRUM
General concepts, Direct sequence (DS), Pseudo Noise (PN), Frequency Hopping, Time Hopping, Comparison of Modulation methods, Hybrid Spread spectrum systems, Chirp spread spectrum, Baseband modulation techniques.

UNIT-II: ANALYSIS OF DIRECT SEQUENCE SPREAD SPECTRUM SYSTEMS
Properties of PN sequences, Classes of periodic sequences, Properties of m sequences, Partial Correlation, PN signal from PN sequences, Partial correlation of PN signals, The PN Signal, De-spreading the PN signal, Interference rejection, Output signal to noise ratio, Anti-jam characteristics, Interception, Energy bandwidth efficiency.

UNIT-III: ANALYSIS OF AVOIDANCE – TYPE SPREAD SPECTRUM SYSTEMS
The frequency hopped signal, Interference rejection in a frequency hopping receiver, the time hopped signal.

UNIT-IV: GENERATION OF SPREAD SPECTRUM SIGNALS
Shift register sequence generators, Discrete frequency synthesizers, SAW device PN generators, Charge coupled devices, Digital tapped delay lines.

UNIT-V: DETECTION OF SPREAD SPECTRUM SIGNALS - TRACKING
Coherent direct sequence receivers, other method of carrier tracking, Delay lock loop analysis, Tau – Dither loop, Coherent carrier tracking, Non coherent frequency hop receiver.

UNIT-VI: DETECTION OF SPREAD SPECTRUM SIGNALS - AQUISITION

Acquisition of spread spectrum signals, Acquisition cell by cell searching, Reduction of acquisition time, Acquisition with matched filters, Matched filters for PN sequences, Matched filters for frequency hopped signals, Matched filters with acquisition - aiding waveform.

UNIT-VII: APPLICATION OF SPREAD SPECTRUM TO COMMUNICATIONS

General capabilities of spread spectrum, Multiple access considerations, Energy and bandwidth efficiency in multiple access, Selective calling and Identification, Anti-jam considerations, Error correction coding, Intercept consideration (AI), Miscellaneous considerations, Examples of spread spectrum systems.

UNIT-VIII: CODE DIVISION MULTIPLE ACCESS DIGITAL CELLULAR SYSTEMS

Introduction, Cellular radio concept, CDMA Digital cellular systems, Specific examples of CDMA digital cellular systems.

TEXT BOOKS:

1. George. R. Cooper and Clare D.McGillem, *Modern Communications and Spread Spectrum,* McGraw Hill.
2. Roger L. Peterson, Rodger E.Ziemer & David E. Borth, *Introduction to Spread Spectrum Communications,* Prentice Hall, 1995.

REFERENCE BOOKS:

1. Dr. Kamilo Feher, *Wireless Digital Communications: Modulation & Spread Spectrum Applications,* PHI, 1999.
2. Upena Dalal, *Wireless Communication,* Oxford Higher Education, 2009.
3. Andrea Goldsmith, *Wireless Communications,* Cambridge University Press, 2005.

IV B.Tech. I Semester

10BT70404: TELECOMMUNICATION SWITCHING SYSTEMS

(Elective - I)

L	T	P	C
4	-	-	4

UNIT-I: TELECOMMUNICATION SWITCHING SYSTEMS
Introduction, Elements of switching systems, switching network configuration.

UNIT-II:
Electronic space division switching, Time division switching, Combination switching.

UNIT-III: TELEPHONE NETWORKS
Subscriber loop systems, switching hierarchy and routing, transmission plan, numbering plan, charging plans.

UNIT-IV: SIGNALING TECHNIQUES
In channel signaling, common channel signaling, Network traffic load and parameters, grade of service and blocking probability.

UNIT-V: DATA COMMUNICATION NETWORKS
Introduction, network architecture, layered network architecture, protocols, data communications hardware, data communication circuits.

UNIT-VI:
Public switched data networks, connection oriented & connection less service, Circuit Switching, packet switching and virtual circuit switching concepts, OSI reference model, Network Topologies, Repeaters, Bridges, Routers and gate ways, LAN-Ethernet, Token Ring , FDDI,WAN-DQDB,SMDS, MAN & Internet.

UNIT-VII: INTEGRATED SERVICES DIGITAL NETWORK (ISDN)
Introduction, motivation, ISDN architecture, ISDN interfaces, functional grouping, reference points, protocol architecture, signaling, numbering, addressing, BISDN.

UNIT-VIII: DSL TECHNOLOGY

ADSL, Cable Modem, Traditional Cable Networks, HFC Networks, Sharing, CM & CMTS and DOCSIS.

SONET: Devices, Frame, Frame Transmission, Synchronous Transport Signals, STS I, Virtual Tributaries and Higher rate of service.

TEXT BOOKS:

1. Thyagarajan Viswanath, *Telecommunication Switching Systems and Networks,* PHI, 2000.
2. Wayne Tomasi, *Advanced electronic communications systems,* PHI, 2004.
3. Achyut. S.Godbole, *Data Communications & Networks,* TMH, 2004.

REFERENCE BOOKS:

1. B.A. Forouzan, *Data Communication & Networking,* 4th Edition, TMH, 2006.
2. J. Bellamy, *Digital telephony,* 2nd Edition, John Wiley, 2001.
3. H. Taub & D. Schilling, *Principles of Communication Systems,* 2nd Edition, TMH, 2003.

IV B.Tech. I Semester

10BT70405: EMBEDDED AND REALTIME SYSTEMS

(Elective - I)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

Embedded systems overview, classification, applications, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

UNIT-II: GENERAL PURPOSE PROCESSORS

Basic architecture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Microcontrollers and Digital Signal Processors.

UNIT-III: STATE MACHINE AND CONCURRENT PROCESS MODELS

Introduction, models versus languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT-IV: COMMUNICATION INTERFACE

Need for communication interfaces, RS232 / UART, RS422 / RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, I^2C bus and CAN.

UNIT-V: EMBEDDED/RTOS CONCEPTS–I

Architecture of the Kernel, Tasks and Task scheduler, Types of real-time tasks, Task periodicity, Task scheduling, Classification of scheduling algorithms, Clock driven Scheduling, Event driven Scheduling, resource sharing, Commercial RTOs.

UNIT-VI: EMBEDDED/RTOS CONCEPTS–II

Interrupt service routines, Semaphores, Mutex, Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority inversion problem.

UNIT-VII: TARGET ARCHITECUTERS

Host and target machines, linkers, loading software into target machine, debugging techniques, ARM microcontroller, ARM pipeline, Instruction set architecture, THUMB instructions, Exceptions in ARM, salient features of SHARC microcontroller and comparison with ARM microcontroller.

UNIT-VIII: DESIGN TECHNOLOGY

Introduction, Automation, Synthesis, Parallel evolution of compilation and synthesis, Logic Synthesis, RT synthesis, Behavioral Synthesis, Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation, Reuse of intellectual property codes.

TEXT BOOKS:

1. Frank Vahid, Tony D. Givargis, *Embedded System Design – A Unified Hardware/Software Introduction,* John Wiley, 2002.
2. KVKK Prasad, *Embedded/Real Time Systems,* Dreamtech Press, 2005.
3. Santanu Chattopadyay, *Embedded System Design,* PHI, 2010.

REFERENCE BOOKS:

1. Jonathan W. Valvano, Brooks/Cole, *Embedded Microcomputer Systems,* Thompson Learning, 2002.
2. David E. Simon, *An Embedded Software Primer,* Pearson Education, 2005.
3. Sri Ram VIyer, Pankaj Gupta, *Embedded Real Time Systems Programming,* TMH, 2004.

IV B.Tech. I Semester

10BT70406: DSP PROCESSORS AND ARCHITECTURE

(Elective - I)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO PRGRAMMABLE DSPs
Multiplier & Multiplier accumulator, Modified bus structures & memory access schemes in P – DSPs, Multiple access memory, Multi ported memory, VLIW architecture, Pipelining, Special addressing modes in P–DSPs, On chip peripherals.

UNIT-II: COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATIONS
Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT-III: ARCHITECTURES FOR PROGRAMMABLE DSP DEVICES
Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT-IV: PROGRAMMABLE DIGITAL SIGNAL PROCESSORS
Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX processors, Pipeline Operation of TMS320C54XX Processors.

UNIT-V: IMPLEMENTATIONS OF BASIC DSP ALGORITHMS
The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing.

UNIT-VI: IMPLEMENTATION OF FFT ALGORITHMS

An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

UNIT-VII: INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSP DEVICES

Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

UNIT-VIII: RECENT TRENDS IN DSP SYSTEM DESIGN

An over-view of the application nodes on DSP systems, An over-view of open multimedia applications platform (OMAP), An Introduction to FPGA, Design flow for an FPGA based system design, CAD tools for FPGA based system design, soft core processors, FPGA based DSP system design, New algorithms for Implementation of filters in VLSI, Distributed arithmetic algorithm, Case studies, Comparison of the performances of the systems designed using FPGAs and digital signal processors.

TEXT BOOKS:

1. Avtar Singh and S. Srinivasan, *Digital Signal Processing*, Thomson Publications, 2004.
2. B. Venkata Ramani and M. Bhaskar, *Digital Signal Processors: Architecture, Programming and Applications*, TMH, 2004.

REFERENCE BOOKS:

1. Jonathan Stein, *Digital Signal Processing*, John Wiley, 2005.
2. Lapsley et al., *DSP Processor Fundamentals: Architectures & Features*, S. Chand & Co, 2000.

IV B.Tech. I Semester

10BT70407: OPTICAL COMMUNICATIONS

(Elective - II)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION TO OPTICAL FIBER WAVEGUIDES
Historical Development, The General System, Advantages of Optical Fiber Communications, Ray Theory Transmission, Electromagnetic Mode Theory for Optical Propagation, Cylindrical Fiber.

UNIT-II:
Single Mode Fibers, Fiber Materials, Fiber Fabrication, Mechanical Properties of Fibers, Fiber Optic Cables.

UNIT-III: FIBER LOSSES
Attenuation, Absorption, Scattering, Bending and Core & Cladding losses. Signal Distortion in Fibers - Pulse Broadening.
Dispersion : Intramodal Dispersion, Intermodal Dispersion, Overall Fiber Dispersion in Multi Mode and Single Mode Fibers. Polarization.

UNIT-IV: OPTICAL SOURCES
LIGHT EMITTING DIODES (LEDs): LED Structures, Light Source Materials, Quantum Efficiency and LED Power, Modulation of LED.
LASER DIODES: Laser Diode Modes and Threshold Conditions, Laser Diode Rate Equations, External Quantum Efficiencies, Resonant Frequencies.

UNIT-V: POWER LAUNCHING AND COUPLING
Source to Fiber Power Launching, Lensing Schemes for Coupling Improvement, Fiber-to-Fiber Joints, Fiber alignment and joint loss, LED coupling to single mode fibers, Fiber Splices, Fiber Connectors.

UNIT-VI: OPTICAL DETECTORS
Physical Principles of Photo Diodes, Photo Detector Noise, Detector Response Time, Avalanche Multiplication Noise, Structures for InGaAs & APDs, Temperature Effect on Avalanche Gain, Comparisons of Photo Detectors.

UNIT-VII:
DIGITAL LINKS: Point-to-Point Links, Power Penalties, Error Control.
ANALOG LINKS: Overview, Carrier to Noise Ratio, Multi-channel Transmission Techniques, RF over Fiber, Radio over Fiber Links.

UNIT-VIII: WDM CONCEPTS AND COMPONENTS

Overview, Passive Optical Couplers, Isolators & Circulators, Fiber Grating Filters, Dielectric Thin Film Filters, Phased Array based Devices, Diffraction Gratings, Active Optical Components, Tunable Light Sources.

TEXT BOOKS:

1. Gerd keiser, *Optical Fiber Communications,* 4th Edition, McGraw Hill International, 2010.
2. John M. Senior, *Optical Fiber Communications,* 3rd Edition, PHI, 2010.

REFERENCE BOOKS:

1. Max Ming-Kang Liu, *Principles and Applications of Optical Communications,* TMH, 2010.
2. S.C.Gupta, *Optical Fiber Communication and its Applications,* PHI, 2005.
3. Satish Kumar, *Fundamentals of Optical Fiber Communications,* PHI, 2009.

IV B.Tech. I Semester

10BT50504: OPERATING SYSTEMS

(Elective - II)

L	T	P	C
4	-	-	4

UNIT I: OPERATING SYSTEMS OVERVIEW
Introduction, Operating system operations, Process management, Memory management, Storage management, Protection and Security, Distributed Systems, Special purpose systems.
Operating systems structures: Operating system services and Systems calls, System programs, Operating system structure, Operating systems generations.

UNIT II: PROCESS MANAGEMENT
Process concepts, Process state, Process control block, Scheduling queues, Process scheduling, Multithreaded programming, threads in UNIX, Comparison of UNIX and Windows.

UNIT III: CONCURRENCY AND SYNCHRONIZATION
Process synchronization, Critical-section problem, Peterson's Solution, Synchronization Hardware, semaphores, Classic problems of synchronization, Readers and Writers problem, Dining-philosophers problem, Monitors, Synchronization examples(Solaris), atomic transactions. Comparison of UNIX and Windows.

UNIT IV: DEADLOCKS
System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock- bankers algorithm.

UNIT V: MEMORY MANAGEMENT
Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, Allocation of frames, Thrashing, case study-UNIX.

UNIT VI: FILE SYSTEM
Concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.
File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and Windows.

UNIT VII: I/O SYSTEM

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling algorithms, swap-space management, stable-storage implementation, Tertiary storage structure.

I/O: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT VIII: PROTECTION AND SECURITY

Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights.

Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems.

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, 7th Edition, John Wiley.

REFERENCE BOOKS:

1. Stallings, *Operating Systems, Internals and Design Principles*, 5th Edition, Pearson Education, 2006.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition, PHI, 2007.
3. Deitel & Deitel, *Operating systems*, 3rd Edition, Pearson Education, 2008.
4. Crowley, *Operating systems Oriented Approach*, TMH, 1998.
5. Dhamdhere, *Operating systems*, 2nd Edition, TMH, 2008.

IV B.Tech. I Semester

10BT70408: RADAR SYSTEMS

(Elective - II)

L	T	P	C
4	-	-	4

UNIT-I: BASICS OF RADAR
Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications, Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, Illustrative Problems.

UNIT-II: RADAR EQUATION
SNR, Envelope Detector, False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross section of Targets (simple targets - sphere, cone-sphere), Transmitter Power, PRF and Range Ambiguities, System Losses (qualitative treatment), Illustrative Problems.

UNIT-III: CW AND FREQUENCY MODULATED RADAR
Doppler Effect, CW Radar – Block Diagram, Isolation between Transmitter and Receiver, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar, Illustrative Problems.
FM-CW Radar, Range and Doppler Measurement, Block Diagram and Characteristics (Approaching/ Receding Targets), FM-CW altimeter, Multiple Frequency CW Radar.

UNIT-IV: MTI AND PULSE DOPPLER RADAR
Introduction, Principle, MTI Radar with - Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers – Filter Characteristics, Blind Speeds, Double Cancellation, Staggered PRFs. Range Gated Doppler Filters, MTI Radar Parameters, Limitations to MTI Performance,MTI versus Pulse Doppler radar.

UNIT-V: RADAR TRACKING
Tracking with Radar, Sequential Lobing, Conical Scan, Monopulse Tracking Radar – Amplitude Comparison Monopulse (one- and two-coordinates), Phase Comparison Monopulse, Tracking in Range, Acquisition and Scanning Patterns, Comparison of Trackers.

UNIT-VI: DETECTION OF RADAR SIGNALS IN NOISE
Introduction, Matched Filter Receiver – Response Characteristics and Derivation, Correlation Function and Cross-correlation Receiver, Efficiency of Non-matched Filters, Matched Filter with Non-white Noise.

UNIT-VII: RADAR RECEIVERS
Noise Figure and Noise Temperature, Display types. Duplexers – Branch type and Balanced type, Circulators as Duplexers. Introduction to Phased Array Antennas – Basic Concepts, Radiation Pattern, Beam Steering and Beam Width changes, Series versus Parallel Feeds, Applications, Advantages and Limitations.

UNIT-VIII: SYNTHETIC APERTURE RADAR
Introduction, Resolution of the SAR, Constraint on Resolution and Swath, Equipment Considerations, Optical Processing, Digital Processing, Doppler-Frequency model, Range Resolution , other aspects of SAR, Inverse SAR, Electronic Counter-Counter Measures.

TEXT BOOKS:
1. Merrill I. Skolnik, *Introduction to Radar Systems*, 2nd Edition, TMH Special Indian Edition, 2007.

REFERENCE BOOKS:
1. Merrill I. Skolnik, *Introduction to Radar Systems*, 3rd Edition, TMH, 2001.
2. Byron Edde, *Radar Principals, Technology, Applications*, Pearson Education, 2004.
3. Peebles, *Radar Principles*, Jr., P.Z.Wiley, NewYork, 1998.

IV B.Tech. I Semester

10BT70409: DIGITAL DESIGN THROUGH VERILOG

(Elective - II)

L	T	P	C
4	-	-	4

UNIT-I:
INTRODUCTION TO VERILOG: Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Functional Verification, System Tasks, Programming Language Interface (PLI), Module, Simulation and Synthesis Tools, Test Benches.
LANGUAGE CONSTRUCTS AND CONVENTIONS: Introduction, Keywords, Identifiers, White Space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data Types, Scalars and Vectors, Parameters, Memory, Operators, System Tasks, Exercises.

UNIT-II: GATE LEVEL MODELING
Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Illustrative Examples, Tri-State Gates, Array of Instances of Primitives, Additional Examples, Design of Flip-flops with Gate Primitives, Delays, Strengths and Contention Resolution, Net Types, Design of Basic Circuits, Exercises.

UNIT-III:
MODELING AT DATA FLOW LEVEL: Introduction, Continuous Assignment Structures, Delays and Continuous Assignments, Assignment to Vectors, Operators.
SWITCH LEVEL MODELING: Introduction, Basic Transistor Switches, CMOS Switch, Bi-directional Gates, Time Delays with Switch Primitives, Instantiations with Strengths and Delays, Strength Contention with Trireg Nets, Exercises.

UNIT-IV: BEHAVIORAL MODELING
Introduction, Operations and Assignments, Functional Bifurcation, Initial Construct, Always Construct, Examples, Assignments with Delays, Wait construct, Multiple Always Blocks, Designs at Behavioral Level, Blocking and Non blocking Assignments, The case statement, Simulation Flow. *if* and *if*-else constructs, assign-deassign construct, repeat construct, for loop, the disable construct, while loop, forever loop, parallel blocks, force-release construct, Event.

UNIT-V:

SYSTEM TASKS, FUNCTIONS, AND COMPILER DIRECTIVES: Introduction, Parameters, Path Delays, Module Parameters, System Tasks and Functions, File-Based Tasks and Functions, Compiler Directives, Hierarchical Access, General Observations, Exercises.

FUNCTIONS, TASKS, AND USER-DEFINED PRIMITIVES: Introduction, Function, Tasks, User- Defined Primitives (UDP), FSM Design (Moore and Mealy Machines).

UNIT-VI: DIGITAL DESIGN WITH SM CHARTS

State Machine Charts, Derivation of SM Charts, Realization of SM Charts, Implementation of the Dice Game, Alternative realizations for SM Charts using Microprogramming, Linked State Machines.

UNIT-VII: DESIGNING WITH PROGRAMMABLE GATE ARRAYS AND COMPLEX PROGRAMMABLE LOGIC DEVICES

Xilinx 3000 Series FPGAs, Designing with FPGAs, Using a One-Hot State Assignment, Altera Complex Programmable Logic Devices (CPLDs), Altera FLEX 10K Series CPLDs.

UNIT-VIII: VERILOG MODELS

Static RAM Memory, A simplified 486 Bus Model, Interfacing Memory to a Microprocessor Bus, UART Design, Design of Microcontroller CPU.

TEXT BOOKS:

1. T.R. Padmanabhan and B. Bala Tripura Sundari, *Design through Verilog HDL,* WSE, IEEE Press, 2004.
2. J. Bhaskar, *A Verilog Primer,* BSP, 2003.
3. Stephen. Brown and Zvonko Vranesic, *Fundamentals of Logic Design with Verilog,* TMH, 2005.

REFERENCE BOOKS:

1. Michael D. Ciletti, *Advanced Digital Design with Verilog HDL,* PHI, 2005.
2. Samir Palnithkar, *Verilog HDL,* 2nd Edition, Pearson Education.

IV B.Tech. I Semester

10BT70411: DIGITAL COMMUNICATIONS AND MICROWAVES LAB

L	T	P	C
-	-	3	2

Minimum Twelve Experiments to be conducted:

Part – A (Any 6 Experiments):

1. Pulse Amplitude Modulation and demodulation
2. Pulse Width Modulation and demodulation
3. Pulse Position Modulation and demodulation
4. Sampling Theorem – verification
5. Pulse code modulation and demodulation
6. Delta modulation and demodulation
7. FSK and PSK Modulation and demodulation
8. DPSK Modulation and demodulation

Part – B (Any 6 Experiments):

1. Reflex Klystron Characteristics
2. Gunn Diode Characteristics
3. Attenuation Measurement
4. Directional Coupler Characteristics
5. VSWR Measurement
6. Impedance Measurement
7. Waveguide parameters measurement

IV B.Tech. I Semester

10BT70412: DIGITAL SIGNAL PROCESSING LAB

L	T	P	C
-	-	3	2

List of Experiments: (Minimum of Twelve experiments to be conducted)

1. To study the architecture of DSP chips – TMS 320C 5X/6X Instructions.
2. To verify linear convolution.
3. To verify the circular convolution.
4. To design FIR filter (LP/HP) using windowing technique
   a) Using Rectangular window
   b) Using Triangular window
   c) Using Kaiser window
5. To design FIR filter (BP/BR) using windowing technique
   a) Using Rectangular window
   b) Using Triangular window
   c) Using Kaiser window
6. To design FIR filter (LP/HP) using windowing technique
   a) Using Hamming window
   b) Using Hanning window
   c) Using Blackmann window
7. To design FIR filter (BP/BR) using windowing technique
   a) Using Hamming window
   b) Using Hanning window
   c) Using Blackmann window
8. To Implement IIR filter (LP/HP) on DSP Processors
9. To Implement IIR filter (BP/BR) on DSP Processors
10. Design of FIR filters using frequency sampling method.
11. To verify N-point DFT & IDFT.
12. N-point FFT algorithm.
13. MATLAB program to find frequency response of analog LP/HP filters.

IV B.Tech. I Semester

10BT7HS01: PROFESSIONAL ETHICS

(Common to ECE, EEE, EIE, EConE, IT & CSE)

(Audit Course)

L	T	P	C
2	-	-	-

UNIT-I: ENGINEERING ETHICS

Scope and aims of engineering ethics-Senses of Engineering Ethics-Variety of Moral Issues-Types of Inquiry- Moral Dilemmas- Moral Autonomy- Kohlberg's Theory, Gilligan's theory, Consensus and Controversy.

UNIT-II: PROFESSIONAL IDEALS AND VIRTUES

Theories about virtues, professional responsibility, integrity, self-respect, sense of "responsibility". Self-Interest, Customs and Religion- Self-interest and ethical egoism, customs and ethical relativism, religion and divine command ethics. Use of ethical theories- resolving moral dilemmas and Moral leadership.

UNIT-III: ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation- similarities to standard experiments, learning from the past and knowledge gained. Engineering as Responsible experiments-Conscientiousness. Moral autonomy and accountability, the challenger case.

UNIT-IV: RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty, Respect for authority, collective bargaining, confidentiality, conflict of interests, occupational crime. Rights of Engineers- Professional rights, whistle-blowing, The bart case, employee rights and discrimination.

UNIT-V: GLOBAL ISSUES

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Managers, Consultants and Leaders. Engineers as managers - Managerial ethics applied to engineering profession.

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, *Ethics in Engineering,* 3rd Edition, TMH, 2007.
2. Govindarajan M, Nata Govindarajan. M, Natarajan. S, Senthilkumar. V.S, *Engineering Ethics*, PHI, 2004.

REFERENCE BOOKS:

1. Dr. S. Kannan, K. Srilakshmi, *Human Values and Professional Ethics*, Taxmann Allied Services Pvt Ltd., 2009.
2. Edmund G seebauer and Robert L Barry, *Fundamental of Ethics for scientists and Engineers*, Oxford University Press, Oxford, 2001.
3. Charles F Fledderman, *Engineering Ethics*, Pearson education/ Prentice Hall, NewJercy, 2004, (Indian reprint).

IV B.Tech. II Semester

10BT80401: CELLULAR AND MOBILE COMMUNICATIONS

L	T	P	C
4	1	-	4

UNIT-I: CELLULAR MOBILE SYSTEMS
Introduction to Cellular Mobile System, Basic Cellular System, Performance Criteria, Uniqueness of Mobile Radio Environment, Hexagonal Shaped Cells, Planning of a Cellular Systems, Analog and Digital Cellular Systems.

UNIT-II: ELEMENTS OF CELLULAR MOBILE RADIO SYSTEM DESIGN
General description of the problem, Concept of Frequency Reuse Channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a Omnidirectional Antenna System, Cell Splitting, Consideration of the Components of Cellular System.

UNIT-III: INTERFERENCE
Introduction to Co-channel Interference, Real Time Co-channel Interference Measurement, Co-channel Measurement, Design of Antenna System for different Cell Patterns, Antenna Parameters and their effects, Diversity Receiver, types of non-Co-channel Interferences.

UNIT-IV: CELL COVERAGE FOR SIGNAL AND TRAFFIC
Signal Reflections in Flat and Hilly Terrain, Point-to-Point Model (Lee Model)- Effect of Human Made Structures, Phase Difference between Direct and Reflected Paths, Constant Standard Deviation, Straight line path loss slope, General Formula for Mobile Propagation Over Water and Flat Open Area, Foliage loss, Near-in and Long distance propagation, Path loss form a Point to Point Prediction Model.

UNIT-V: CELL SITE AND MOBILE ANTENNAS
Sum and Difference Patterns and their Synthesis, Omnidirectional Antennas, Directional Antennas for Interference Reduction, Space Diversity Antennas, Umbrella Pattern Antennas, Minimum Separation of Cell Site Antennas, High Gain Antennas.

UNIT-VI: FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT

Numbering and Grouping, Setup, Access and Paging Channels, Channel Assignments to Cell Sites and Mobile Units, Fixed and non-Fixed Channel Assignments.

UNIT-VII: HANDOFFS AND DROPPED CALLS

Handoff, Types of Handoff-Delaying a Handoff, Forced Handoff, Mobile Assisted Handoff and Soft Handoff, Cell-site Handoff, Intersystem Handoff. Dropped Call Rates and their Evaluation. Cell Splitting and Vehicle Locating Methods.

UNIT-VIII: DIGITAL CELLULAR SYSTEMS

Introduction to 2G Cellular system, GSM architecture, GSM channels, Multiple Access Scheme-TDMA, CDMA. Introduction to 3G Cellular System.

TEXT BOOKS:

1. William C. Y. Lee, *Mobile Cellular Telecommunications,* 2nd Edition, Mc-Graw Hill, 2008.
2. Theodore. S. Rapport, *Wireless Communications,* 2nd Edition, Pearson Education, 2002.

REFERENCE BOOKS:

1. Gordon L. Stuber, *Principles of Mobile Communications,* 2nd Edition, Springer International, 2007.
2. William C. Y. Lee, *Wireless and Mobile Communications,* 3rd Edition, Mc Graw Hills, 2006.
3. Jon W.Mark and Weihua Zhqung, *Wireless Communications and Networking,* Pearson, 2005.
4. R.Blake, *Wireless Communication Technology,* Thompson, Asia Pvt. Ltd., 2004.

IV B.Tech. II Semester

10BT80402: WIRELESS COMMUNICATIONS & NETWORKS

(Elective - III)

L	T	P	C
4	-	-	4

UNIT-I: MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION

Introduction, FDMA, TDMA, Spread Spectrum, Multiple Access, Packet Radio- Packet Radio Protocols, CSMA Protocols, Reservation Protocols, Capture Effect in Packet Radio.

UNIT-II: WIRELESS NETWORKING

Introduction, Difference between Wireless and Fixed Telephone Networks, Development of Wireless Networks, Traffic Routing in Wireless Networks.

UNIT-III: WIRELESS DATA SERVICES

CDPD, ARDIS, RMD, Common Channel Signaling, ISDN, Broadband ISDN and ATM, SS7, SS7 User Part, Signaling Traffic in SS7.

UNIT-IV: MOBILE IP AND WIRELESS APPLICATION PROTOCOL

Operation of mobile IP, Discovery, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML, WML scripts.

WAP protocol stack: Wireless Application Environment, Wireless session Protocol, Wireless Transaction Protocol, Wireless Transport Layer Security Protocol and Wireless Datagram Protocol.

UNIT-V: WIRELESS LAN TECHNOLOGY

Overview, WLAN Requirements, Infrared LANs, Spread Spectrum LANs, Narrow Band Microwave LANs, IEEE 802 Protocol Architecture, IEEE802.11 Architecture and Services, 802.11 Medium Access Control, 802.11 Physical Layer.

UNIT-VI: BLUETOOTH

Overview, Radio Specification, Base band Specification, Links Manager Specification, Logical Link Control and Adaptation Protocol. Introduction to WLL Technology.

UNIT-VII: MOBILE DATA NETWORKS
Introduction, Data oriented CDPD Network, GPRS and higher Data Rates, Short Messaging Service in GSM, Mobile Application Protocol.

UNIT-VIII: WIRELESS ATM, HIPER LAN, Wi-Fi AND WiMAX
Introduction, Wireless ATM, HIPER LAN - Architecture, Physical Model, Layers and Security. Wi-Fi and Introduction to WiMAX.

TEXT BOOKS:

1. Theodore S. Rappaport, *Wireless Communications,* 2nd Edition, PHI, 2008.
2. William Stallings, *Wireless Communications and Networks,* 2nd Edition, Pearson Education, 2007.
3. Kaveh Pahlavan and Prashant Krishna Murthy, *Principles of Wireless Networks,* PHI, 2005.

REFERENCE BOOKS:

1. Kamilo Feher, *Wireless Digital Communications,* PHI, 2001.
2. Andreaws F. Molisch, *Wideband Wireless Digital Communications,* Pearson Education, 2002.
3. Dharma Prakash Agarwal, Qing-An Zeng, *Introduction to Wireless and Mobile Systems,* 2nd Edition, Thomson, 2006.
4. Gordon L. Stuber, *Principles of Mobile Communications,* 2nd Edition, Springer International, 2007.

IV B.Tech. II Semester

10BT71204: CRYPTOGRAPHY AND NETWORK SECURITY

(Elective - III)

L	T	P	C
4	-	-	4

UNIT - I: INTRODUCTION
Security Attacks - Interruption, Interception, Modification and Fabrication. Security Services - Confidentiality, Authentication, Integrity, Non-repudiation, Access control and Availability. Security Mechanisms - A model for Internetwork security, Internet Standards and RFCs, Conventional Encryption Principles, Ceaser Cipher, Hill cipher, Poly and Mono Alphabetic Cipher.

UNIT - II: ENCRYPTION PRINCIPLES
Conventional encryption algorithms: Feistal structure, DES algorithm, S-Boxes, Triple DES, Advanced Data Encryption Standard (AES),Cipher block modes of operation, location of encryption devices, Key Distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT - III: CRYPTOGRAPHY AND APPLICATIONS
Public key cryptography principles, public key cryptography algorithms, Digital signatures, RSA, Elliptic Algorithms, Digital Certificates, Certificate Authority and key management, Kerberos, X.509, Directory Authentication Service.

UNIT - IV: ELECTRONIC MAIL SECURITY
Email privacy: PGP operations, Radix-64 Conversion, Key Management for PGP, PGP Trust Model, Multipurpose Internet Mail Extension (MIME), Secure/MIME(S/MIME).

UNIT - V: IP SECURITY ARCHITECTURE AND SERVICES
IP Security Overview, IP Security Architecture, Security Association, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management: OAKELY key determination protocol, ISAKMP.

UNIT – VI: WEB SECURITY
Web Security Considerations, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - VII: NETWORK MANAGEMENT SECURITY

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.

System Security: Intruders-Intrusion techniques, Intrusion Detection, Password Management, Bot nets.

Malicious Software: Viruses and related threats, Virus Counter Measures, Distributed Denial of Service Attacks.

UNIT - VIII: FIREWALLS

Firewall Design principles, Trusted Systems, Common Criteria for Information Technology Security Evolution.

TEXT BOOKS:

1. William Stallings, *Network Security Essentials* (Applications and Standards), 3rd Edition, Pearson Education.
2. Stallings, *Cryptography and network Security*, 3rd Edition, PHI/ Pearson.

REFERENCE BOOKS:

1. Eric Maiwald, *Fundamentals of Network Security*, (Dreamtech press), 2004.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World*, 2nd Edition, Pearson/PHI.
3. Robert Bragg, Mark Rhodes, *Network Security: The complete reference*, TMH, 2004.
4. Buchmann, *Introduction to Cryptography*, 2nd Edition, Springer, 2004.

IV B.Tech. II Semester

10BT80403: TELEVISION ENGINEERING

(Elective - III)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION

TV transmitter and receiver, synchronization, Television pictures: Geometric form and aspect Ratio, image continuity, interlaced scanning, picture Resolution, composite video signal, TV standards. Camera tube types, Vidicon, Silicon diode array vidicon, Monochrome TV camera, Color camera.

UNIT-II: TV SIGNAL TRANSMISSION AND PROPAGATION

Picture signal transmission, positive and negative modulation, VSB transmission, sound signal transmission, standard channel BW, TV transmitter, TV signal propagation, Interference, TV broadcast channels, TV transmission antennas.

UNIT-III: MONOCHROME TV RECEIVER

RF tuner, IF subsystem, video amplifier, sound section, sync separation and processing, deflection circuits ,scanning circuits, AGC, Noise Cancellation, Video and Intercarrier Sound Signal detection, Vision IF subsystem of BW Receivers, Receiver Sound system: FM detection, FM Sound detectors.

UNIT-IV: SYNC. SEPARATION AND DETECTION

TV receiver tuners: tuner operation, VHF and UHF tuners, digital tuning techniques, Remote control of receiver functions. Synchronous separation.

AFC and Deflection Oscillators: Sync Separation, K Noise in sync Pulses, separation of frame and line sync Pulses. AFC, single ended AFC circuit, Deflection oscillators, deflection drive IC's, Picture tubes.

UNIT-V: COLOR TELEVISION

Color signal Generation, Additive color mixing, Video signals for colors, Color difference Signals, Encoding, Perception of brightness and colors luminance signal, Encoding of color difference signals, formation of chrominance signals, color cameras, Color Picture tubes, Color Specifications.

UNIT-VI: COLOR SIGNAL ENCODING AND DECODING

NTSC color system, PAL color system, PAL encoder, PAL-D decoder, chroma signal amplifiers, separation of U & V signals, color Burst separation, Burst phase discriminator, ACC amplifier, Reference Oscillator, Indent and color killer circuits, RO phase shift and 180^0 PAL-switch circuitry, U & V demodulators, color signal mixing.

UNIT-VII: COLOR RECEIVER

Introduction to color receiver, Electron tuners, IF subsystem, Y-signal channel, Chroma decoder, Separation of U & V color, Phasors, synchronous demodulators, Sub carrier generation, raster circuits.

UNIT-VIII:

Introduction to Digital TV, Digital Satellite TV, Direct to Home Satellite TV, Digital TV Transmitter, Digital TV Receiver, Digital Terrestrial TV, LCD TV, LED TV, CCD Image Sensors, HDTV.

TEXT BOOKS:

1. R.R. Gulati, *Modern Television Practice-Principles, Technology and Service,* New Age International publication, 2004.
2. R.R Gulati, *Monochrome and color TV,* New Age International publication, 2003.

REFERENCE BOOKS:

1. S.P.Bali, *Color Television Theory and practice,* TMH, 1994.
2. A.M. Dhake, *Television and Video Engineering,* 2nd Edition, TMH, 2003.
3. B.Grob and C.E.Herndon, *Basic Television and Video Systems,* McGraw Hill, 1999.

IV B.Tech. II Semester

10BT80404: ADVANCED DIGITAL SIGNAL PROCESSING

(Elective - III)

L	T	P	C
4	-	-	4

UNIT-I: MULTIRATE SIGNAL PROCESSING
Introduction to Multirate Signal Processing, Applications of multirate signal processing - Design of phase shifters, interfacing of digital systems with different sampling rates, implementation of narrow band low pass filters. Digital filter banks, two channel quadrature mirror filter bank, M-channel QMF bank.

UNIT-II: LTI DISCRETE-TIME SYSTEMS IN THE TRANSFORM DOMAIN
Types of Linear-Phase transfer functions, Simple Digital Filters, Complementary Transfer Function, Inverse Systems, System Identification, Digital Two-Pairs, Algebraic Stability Test.

UNIT-III: DIGITAL FILTER SRTUCTURE AND DESIGN
All Pass Filters, Tunable IIR Digital Filter, IIR Tapped Cascade Lattice Structures, FIR Cascaded Lattice Structures, Parallel All Pass Realization of IIR Transfer Functions, State Space Structures, Polyphase Structures, Digital Sine-Cosine Generator, Computational Complexity of Digital Filter Structures, Design of IIR Filter using pade' approximation, Least Square Design Methods, Design of Computationally Efficient FIR Filters.

UNIT-IV: DSP ALGORITHMS
Fast DFT algorithms based on Index mapping, Sliding Discrete Fourier Transform, DFT Computation Over a narrow Frequency Band, Split Radix FFT, Linear filtering approach to Computation of DFT using Chirp Z-Transform.

UNIT-V: POWER SPECTRAL ESTIMATION
Estimation of spectra from finite duration observation of signals, **Non-parametric methods:** Bartlett, Welch & Blackmann & Turkey methods.

UNIT-VI: PARAMETRIC METHODS FOR POWER SPECTRUM ESTIMATION

Relation between Auto correlation & model parameters, Yule-Waker & Burg Methods, MA & ARMA models for power spectrum estimation.

UNIT-VII: ANALYSIS OF FINITE WORDLENGTH EFFECTS IN FIXED-POINT DSP SYSTEMS

Fixed, Floating Point Arithmetic- ADC quantization noise &signal quality-Finite Wordlength effect in IIR digital Filters-Finite wordlength effects in FFT algorithms.

UNIT-VIII: APPLICATIONS OF DIGITAL SIGNAL PROCESSING

Dual Tone Multi-frequency Signal Detection, Spectral Analysis of Sinusoidal Signals, Spectral Analysis of Non stationary Signals, Musial Sound Processing, Over Sampling A/D Converter, Over Sampling D/A Converter, Discrete-Time Analytic Signal Generation.

TEXT BOOKS:

1. Sanjit K Mitra, *Digital Signal Processing,* 3rd Edition, TMH, 2009.
2. J G Proakis, D G Manolokis, *Digital Signal Processing Principles, Algorithms and Applications,* 4th Edition, PHI, 2007.

REFERENCE BOOKS:

1. A V Oppenhiem, R W Schafer, *Discrete-Time Signal Processing,* 2nd Edition, Pearson Education, 2002.
2. Emmanuel C Ifeacher Barrie. W. Jervis, *DSP-A Practical Approach,* Pearson Education.
3. S. M .Kay, *Modern Spectral Estimation Techniques,* PHI, 1997.

IV B.Tech. II Semester

10BT80405: LOW POWER VLSI DESIGN

(Elective - IV)

L	T	P	C
4	-	-	4

UNIT-I: LOW POWER DESIGN, AN OVER VIEW
Review of MOSFET- Regions of operation, Second order effects, static and dynamic characteristics of MOSFET and BJT, Introduction to low-voltage low power design, limitations, Silicon-on-Insulator.

UNIT-II: MOS/BiCMOS PROCESSES
BiCMOS processes, Integrated Analog/Digital CMOS Process.

UNIT-III: INTEGRATION AND ISOLATION CONSIDERATIONS
BiCMOS manufacturing and Integration considerations, process considerations for Bipolar transistors, Isolation in Bipolar and MOS transistors.

UNIT-IV: LOW-VOLTAGE/LOW POWER CMOS/ BICMOS PROCESSES
Deep submicron process flow, SOI CMOS, lateral BJT on SOI, future trends and directions of CMOS/BiCMOS processes.

UNIT-V: CMOS AND BiCMOS LOGIC GATES
Basic Driver configurations, Conventional CMOS and BiCMOS logic gates, Performance Evaluation.

UNIT-VI: LOW- VOLTAGE LOW POWER LOGIC CIRCUITS
Comparison of advanced BiCMOS Digital circuits- Merged BiCMOS circuit, Full Swing Multi drain/ Multi Collector Complementary BiCMOS Buffers, BiNMOS Digital circuits, Boot strapped type BiCMOS Digital Circuits, ESD-free BiCMOS digital circuit- operation and comparative Evaluation.

UNIT-VII: LOW POWER LATCHES AND FLIP FLOPS
Evolution of Latches and Flip flops, Quality measures for latches and Flip flops, Design perspective.

UNIT-VIII: SPECIAL TECHNIQUES

Power Reduction in Clock Networks, CMOS Floating Node, Adiabatic circuits, Low Power Bus, Delay Balancing, Low Power Techniques for SRAM.

TEXT BOOKS:

1. Yeo, Rofail and Gohl, *CMOS/Bi-CMOS ULSI low voltage, low power,* 1st Indian reprint, Pearson Education Asia, 2002.
2. Gary K. Yeap, *Practical Low Power Digital VLSI Design,* KAP, 2002.

REFERENCE BOOKS:

1. Douglas A. Pucknell & Kamran Eshraghian, *Basic VLSI Design,* 3rd Edition, PHI.
2. J.Rabaey, *Digital Integrated circuits,* PH. N.J 1996.
3. Sung-mo Kang & Yusuf Leblebici, *CMOS Digital ICs,* 3rd Edition, TMH, 2003.
4. IEEE Trans on Electron Devices, IEEE J. Solid State Circuits, and other National and International Conferences and Symposia.

IV B.Tech. II Semester

10BT80406: SATELLITE COMMUNICATIONS

(Elective - IV)

L	T	P	C
4	-	-	4

UNIT-I: INTRODUCTION
Origin of Satellite Communications, Historical Background, Basic Concepts of Satellite Communications, Frequency Allocations for Satellite Services, Applications, Future Trends of Satellite Communications.

UNIT-II: ORBITAL MECHANICS AND LAUNCHERS
Orbital Mechanics, Look Angle Determination, Orbital Perturbations, Orbit Determination, Launches and Launch Vehicles, Orbital Effects in Communication Systems Performance.

UNIT-III: SATELLITE SUBSYSTEMS
Satellite Subsystems - Attitude and Orbital Control System, Telemetry, Tracking, Command and Monitoring, Power Systems, Communication Subsystems, Satellite Antenna, Equipment Reliability and Space Qualification.

UNIT-IV: SATELLITE LINK DESIGN
Basic Transmission Theory, System Noise Temperature and G/T ratio, Design of Down Links, Uplink Design, Design of Satellite Links for specified C/N, System Design example.

UNIT-V: MULTIPLE ACCESS
Frequency Division Multiple Access (FDMA), Intermodulation, Calculation of C/N, Time Division Multiple Access (TDMA) Frame Structure, examples. Satellite Switched TDMA Onboard Processing, DAMA, Code Division Multiple Access (CDMA), Spread Spectrum Transmission and Reception.

UNIT-VI: EARTH STATION SUBSYSTEMS
Introduction, Transmitters, Receivers, Antennas, Tracking Systems, Terrestrial Interface, Primary Power and Test Methods.

UNIT-VII: LOW EARTH ORBIT AND GEOSTATIONARY SATELLITE SYSTEMS

Orbit Consideration, Coverage and Frequency Considerations, Delay and Throughput Considerations, System Considerations, Operational NGSO Constellation Designs.

UNIT-VIII: SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM

Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers and Codes, Satellite Signal Acquisition, GPS Navigation Message, GPS Signal Levels, Timing Accuracy, GPS Receiver Operation, GPS C/A Code Accuracy, Differential GPS.

TEXT BOOKS:

1. Timothy Pratt, Charles W Bostian and Jeremy E Allnutt, WSE, *Satellite Communications,* 2nd Edition, Wiley publications, 2007.
2. Wilbur L.Pritchard, Henri G.Suyderhoud and Robert A. Nelson, *Satellite Communications Engineering,* 2nd Edition, Pearson Publications, 2008.

REFERENCE BOOKS:

1. M. Richharia, *Satellite Communication Systems Design Principles,* 2nd Edition, Mc Millan Publications, 1999.
2. D.C.Agarwal, *Satellite communications,* 7th Edition, Khanna Publications, 2009.
3. K.N.Raja Rao, *Fundamentals of Satellite communications,* PHI, 2009.
4. Dennis Roddy, *Satellite communications,* 4th Edition, McGraw Hill, 2006.

IV B.Tech. II Semester

10BT61002: BIOMEDICAL INSTRUMENTATION

(Elective - IV)

L	T	P	C
4	-	-	4

UNIT-I
Components of medical instrumentation system, static and dynamic characteristics of medical instruments, biosignals and characteristics, bioamplifier. Problems encountered with measurements from human beings.

UNIT-II: ELECTRO PHYSIOLOGY
Review of Physiology and anatomy. Structure of cell,sources of bioelectric potentials, resting and action potentials, propagation of action potentials, conduction through nerve to neuromuscular junction.

UNIT-III: ELECTRODE THEORY
Electrode-electrolye interface, electrode-electrolyte-skin interface, motion artifacts, external and internal electrodes, bio chemical electrodes, transducers for biomedical applications.

UNIT-IV: CARDIOVASCULAR INSTRUMENTATION
Physiology of cardiovascular system, electrical conduction system of the heart, interpretation of ECG waveform, standard 12-lead configurations, Einthoven triangle, specifications of ECG Machine. Blood pressure, blood flow and heart sound measurements. Relation between electrical and mechanical activities of the heart.

UNIT-V: NEURO-MUSCULAR INSTRUMENTATION
Physiology of nervous system, electrode placement for EEG and EMG recording. Specification of EEG and EMG machines, Interpretation of EEG and EMG.

UNIT-VI: THERAPEUTIC EQUIPMENT
Pacemaker, Defibrillator, cardio vector, Diathermy: Shortwave and microwave. Hemodialysis machine.

UNIT-VII: RESPIRATORY INSTRUMENTATION
Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

UNIT-VIII: MEDICAL IMAGING SYSTEM

Radiography, computed radiography, computed tomography, magnetic resonance imaging, ultrasonography.

TEXT BOOKS:

1. Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, *Biomedical Instrumentation and Measurements,* 2nd Edition, PHI, 2009.
2. John G. Webster, *Medical Instrumentation, Application and Design*, John Wiley, 2007.

REFERENCE BOOK:

1. R.S. Khandpur, *Hand-book of Biomedical Instrumentation*, 2nd Edition, TMH, 2007.

IV B.Tech. II Semester

10BT71301: NEURAL NETWORKS AND FUZZY SYSTEMS

(Elective - IV)

L	T	P	C
4	-	-	4

UNIT I: INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS
Introduction, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Types of Neuron Activation Function, ANN Architectures, Supervised, Unsupervised, Reinforced Learning, Potential applications to ANN.

UNIT II: FEED FORWARD NETWORKS
Perceptron Models, Learning Rules, Hebbian Learning Rule, Perceptron Learning Rule, Delta Learning Rule, Back propagation, Architecture, Calculation of error, Training algorithm, Applications, Kohenen Self organizing Feature map, Architecture, Training, Learning Vector Quantizer (LVQ).

UNIT III: FEEDBACK AND COUNTER PROPAGATION NETWORKS
Hopfield network, Architecture, Training algorithm, Application. Full Counter Propagation Network (Full CPN), Architecture, Training Phases of Full CPN, Training Algorithm, Application.

UNIT IV: ASSOCIATIVE MEMORIES
General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms, Basic architecture BAM Energy Function, Adaptive resonant Theory, ART1, ART2, Architecture, Algorithm, Applications.

UNIT V: CLASSICAL & FUZZY SETS
Introduction to classical sets, properties, Fuzzy sets, Membership functions, Classical Relations and Fuzzy Relations, Composition.

UNIT VI: FUZZY LOGIC SYSTEM COMPONENTS
Properties of Membership Functions, Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification, methods, α-cuts for Fuzzy Relations, Extension principle.

UNIT VII: FUZZY SYSTEMS

Natural Language, Linguistic Hedges, Fuzzy (Rule-Based) Systems, Graphical Techniques of Inference, Fuzzy Control Systems, Control System Design Problem, Simple Fuzzy Logic Controllers-Examples.

UNIT VIII: NEURAL NETWORK AND FUZZY APPLICATIONS

Neural network applications: Load forecasting, Process identification, control and fault diagnosis (Image Processing).

Fuzzy logic applications: Temperature control, Cruise control application, Air conditioner control, DC motor speed control.

TEXT BOOKS:

1. S. Rajasekharan and G. A. Vijayalakshmi pai, *Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications*, PHI, 2004.
2. Timothy J. Ross, *Fuzzy Logic with Engineering Applications*, McGraw-Hill International, 1997.

REFERENCE:

1. Simon Haykin, *Neural Networks- A comprehensive foundation,* Pearson Education, 2001.
2. S.N.Sivanandam, S.Sumathi,S. N. Deepa, *Introduction to Neural Networks using MATLAB 6.0,* TMH, 2006.
3. Philip D.Wasserman, *Neural computing*, Wiley Publications.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (yearly pattern)

Electrical and Electronics Engineering

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT1BS04	Mathematical Methods	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics and Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language and Communication skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering and IT workshop	-	-	3	4	25	50	75
	TOTAL	**15**	**6**	**15**	**50**	**305**	**670**	**975**

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(Autonomous)
Sree Sainath Nagar, Tirupati - 517 102

Department of Electrical and Electronics Engineering

B.Tech. (EEE) Course Structure
2010 - 2011

II YEAR : I SEMESTER

Subject Code	Subject	Periods per Week			C	Scheme of Examination Maximum Marks		
		L	T	P		Internal	External	Total
10BT3BS03	Special Functions and Complex Analysis	4	1	-	4	30	70	100
10BT30121	Fluid Mechanics and Hydraulic Machinery	4	1	-	4	30	70	100
10BT30401	Semiconductor Devices and Circuits	4	1	-	4	30	70	100
10BT40404	Switching Theory and Logic Design	4	1	-	4	30	70	100
10BT30201	Electrical Circuits	4	1	-	4	30	70	100
10BT30202	DC Machines	4	1	-	4	30	70	100
10BT40112	Fluid Mechanics and Hydraulic Machinery Lab	-	-	3	2	25	50	75
10BT30211	DC Machines Lab	-	-	3	2	25	50	75
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

II YEAR : II SEMESTER

Subject Code	Subject	Periods per Week			C	Scheme of Examination Maximum Marks		
		L	T	P		Internal	External	Total
10BT40421	Analog Electronic Circuits	4	-	-	4	30	70	100
10BT40201	Network Analysis and Synthesis	4	-	-	4	30	70	100
10BT40202	Electromagnetic Fields	4	1	-	4	30	70	100
10BT40203	Generation of Electrical Power	4	-	-	4	30	70	100
10BT40204	Electrical Measurements	4	1	-	4	30	70	100
10BT40205	Transformers and Induction Machines	4	1	-	4	30	70	100
10BT30411	Semiconductor Devices and Circuits Lab	-	-	3	2	25	50	75
10BT40211	Electrical Circuits and Simulation Lab	-	-	3	2	25	50	75
10BT4HS02	**Audit Course:** Advanced English Communication Skills	-	3	-	-	-	-	-
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III YEAR : I SEMESTER

Subject Code	Subject	Periods per Week			C	Scheme of Examination Maximum Marks		
		L	T	P		Internal	External	Total
10BT3BS02	Environmental Sciences	4	1	-	4	30	70	100
10BT40501	Computer Architecture and Organization	4	1	-	4	30	70	100
10BT41301	Control Systems	4	1	-	4	30	70	100
10BT50201	Power Electronics	4	1	-	4	30	70	100
10BT50202	AC Machines	4	1	-	4	30	70	100
10BT50203	Electrical Power Transmission	4	1	-	4	30	70	100
10BT50211	Transformers and AC Machines Lab	-	-	3	2	25	50	75
10BT50212	Measurements and Testing Lab	-	-	3	2	25	50	75
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III YEAR : II SEMESTER

Subject Code	Subject	Periods per Week			C	Scheme of Examination Maximum Marks		
		L	T	P		Internal	External	Total
10BT4HS01	Managerial Economics and Principles of Accountancy	4	1	-	4	30	70	100
10BT60401	Digital Signal Processing	4	1	-	4	30	70	100
10BT50422	Linear and Digital IC Applications	4	1	-	4	30	70	100
10BT60404	Microprocessors and Microcontrollers	4	1	-	4	30	70	100
10BT60201	Utilization of Electrical Energy	4	1	-	4	30	70	100
10BT60202	Power Semiconductor Drives	4	1	-	4	30	70	100
10BT60211	Control Systems and Simulation Lab	-	-	3	2	25	50	75
10BT60212	Power Electronics and Simulation Lab	-	-	3	2	25	50	75
10BT60213	Seminar	-	-	-	2	75	-	75
	Total	**24**	**6**	**6**	**30**	**305**	**520**	**825**

IV YEAR : I SEMESTER

Subject Code	Subject	Periods per Week			C	Scheme of Examination Maximum Marks		
		L	T	P		Internal	External	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
10BT70201	Switchgear and Protection	4	-	-	4	30	70	100
10BT70202	Power System Operation and Control	4	1	-	4	30	70	100
10BT70203	Power System Analysis	4	1	-	4	30	70	100
	Elective - I	4	1	-	4	30	70	100
	Elective - II	4	1	-	4	30	70	100
10BT60411	Microprocessors and Microcontrollers Lab	-	-	3	2	25	50	75
10BT70211	Power Systems and Simulation Lab	-	-	3	2	25	50	75
10BT70212	Mini Project	-	-	-	2	25	50	75
10BT7HS01	**Audit Course:** Professional Ethics	2	-	-	-	-	-	-
	Total	**26**	**4**	**6**	**30**	**255**	**570**	**825**

Subject Code	Subject
	ELECTIVE - I
10BT71302	Programmable Logic Controllers
10BT50423	Principles of Communication
10BT60405	VLSI Design
10BT70421	Advanced Microprocessors and Microcontrollers
	ELECTIVE - II
10BT51301	Advanced Control Systems
10BT70204	Flexible AC Transmission
10BT70205	High Voltage DC Transmission
10BT70206	Renewable Energy Sources

IV YEAR : II SEMESTER

Subject Code	Subject	Periods per Week			C	Scheme of Examination Maximum Marks		
		L	T	P		Internal	External	Total
10BT70405	Embedded and Real Time Systems	4	1	-	4	30	70	100
	Elective – III	4	1	-	4	30	70	100
	Elective – IV	4	1	-	4	30	70	100
10BT80211	Comprehensive Viva-Voce	-	-	-	2	100	-	100
10BT80212	Project	-	-	12	12	75	150	225
	Total	**12**	**3**	**12**	**26**	**265**	**360**	**625**

Subject Code	Subject
	ELECTIVE - III
10BT50503	Database Management Systems
10BT70521	Operating System Principles
10BT71301	Neural Networks and Fuzzy Systems
10BT4EC01	Optimization Techniques
	ELECTIVE - IV
10BT80201	EHVAC Transmission
10BT80202	Distribution of Electrical Power
10BT80203	High Voltage Engineering
10BT80204	Reliability Engineering and Applications to Power Systems

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1BS04: MATHEMATICAL METHODS

(Common to CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT–I

Matrices and Linear System of Equations : Rank of a matrix, echelon form, normal form, inverse of a matrix by normal form. Homogenous and non-homogenous linear systems, consistency and solutions of linear system of equations. Direct methods, Gauss elimination method, Gauss Siedel, Gauss Jordan method, factorization method.

UNIT-II

Eigen Values and Eigen Vectors : Definitions, evaluation of eigen values, eigen vectors and properties. Cayley Hamilton theorem (without proof), inverse and powers of a matrix by Cayley Hamilton theorem, diagonalization of a matrix, quadratic forms and reduction to its normal form (problems dealing with distinct eigen values only).

UNIT-III

Algebraic, Transcendental Equations and Curve Fitting: Solutions of algebraic and transcendental equations by bisection method, false position method, Newton-Raphson's method, iterative method. Curve fitting by the principle of least squares, fitting of a straight line, parabola, exponential and power curves.

UNIT-IV

Interpolation: Interpolation, forward difference operator, backward difference operator, central difference operator, relationship between operators, Newton's forward formula, Newton's backward formula, Gauss forward formula, Gauss backward formula, Lagranges interpolation formula.

UNIT-V

Numerical Differentiation and Integration: Numerical values of derivatives using Newton's forward formula, Newton's backward formula.

Numerical Integration: Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule.

UNIT-VI

Numerical Solutions of Ordinary Differential Equations: Numerical solutions of ordinary differential equations using Taylor series, Euler's method, modified Euler's method, Runge–Kutta method (2^{nd} and 4^{th} orders only), Milne's predictor corrector method.

UNIT-VII

Z – Transformations: Z–transforms, inverse Z–transform, properties, damping rule, shifting rule, initial and final value theorems. Convolution theorem, solution of difference equations by Z–transforms.

UNIT-VIII

Fourier Series and Fourier Transforms: Definition, Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd function, half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, properties, inverse transform, finite Fourier transforms.

TEXTBOOK:

Mathematical Methods, T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, S.Chand and Company, 5^{th} edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36^{th} Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley and Sons, Inc., 8^{th} Edition
3. *Introductory methods of Numerical Analysis ,* S.S.Sastry, Prentice Hall of India, 3^{rd} Edition
4. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3^{rd} Edition

B.Tech. I Year

10BT1EC01: **PROBLEM SOLVING AND COMPUTER PROGRAMMING**

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | $x^2 + y^2$| + $\sqrt{}$2xy
iii) $x^5 + 10\ x^4 + 8\ x^3 + 4\ x + 2$
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

B.Tech. II Year I Semester

10BT3BS03 : SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

(Common to EEE, ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : PARTIAL DIFFERENTIAL EQUATIONS

Formation of partial differential equations, solutions of first order partial differential equations using Lagrange's method, method of separation of variables - solutions of one dimensional wave equation - heat equation- two dimensional Laplace equation under boundary conditions.

UNIT-II : SPECIAL FUNCTIONS

Euler's Integrals - beta and gamma functions - properties - relationship between beta and gamma functions- applications - evaluation of improper integrals using Beta and Gamma functions

Bessel function: Generating function-properties of Bessel functions - recurrence relations-Orthogonality.

UNIT-III : LIMITS AND CONTINUITY - ANALYTIC FUNCTIONS

Exponential, Trigonometric, logarithmic, Hyperbolic and general power (Z^c) - separation of real and imaginary parts - Limits and Continuity of functions. Differentiability - Analyticity - Cauchy Riemann equations- conjugate and harmonic conjugate functions - Milne Thompson method- potential functions.

UNIT-IV : COMPLEX INTEGRATION

Line integral - evaluation of line integrals along curves and closed contours - Cauchy's Integral theorem - Cauchy's integral formula - Derivatives of analytic function - generalized integral formula.- Evaluation of integrals using integral formulae.

UNIT-V : COMPLEX POWER SERIES

Taylor theorem (with proof) - Laurent's theorem (without proof) - Taylor and Laurent series expansions of complex functions - Singularities - types - residues - poles of order m.

UNIT-VI : RESIDUE CALCULUS

Residue theorem - proof - applications - evaluation of integrals using residue theorem - evaluation of improper and real integrals of the type

i) $\int_{-\infty}^{\infty} f(x)dx$ ii) $\int_{0}^{2\Pi} f(\cos\theta, \sin\theta)d\theta$ iii) $\int_{-\infty}^{\infty} e^{imx} f(x)dx$

UNIT-VII : ROUCHE'S THEOREM - APPLICATIONS

Argument principle - Rouche's theorem - determination of number of zeros of complex polynomials - maximum modules principle - Fundamental theorem of Algebra - Cauchy's inequality - Liouville's theorem.

UNIT-VIII : CONFORMAL MAPPING

Definitions and examples, Mappings defined by $w = e^z$, ln z, z^2, sinz, cosz. Translation, Rotation, Inversion and Bilinear transformation - properties - fixed point - cross ratio - invariance of circles under bilinear transformation - determination of bilinear transformation using three given points.

TEXT BOOKS:

1. T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, *Mathamatical Methods*, 5th Revised Edition, S. Chand & Company, 2010.
2. T.K.V. Iyenger, B. Krishna Gandhi..et al., *Text book of Engineering Mathematics*, Vol-III, 8th edition, S. Chand & Company, 2011.

REFERENCE BOOKS:

1. Grewal, B.S., *Higher engineering Mathematics*, 36th edition, Khanna Publishers, Delhi.
2. Kreyszig, E., *Advanced Engineering Mathematics*, 8th edition, John-Wiley.

B.Tech. II Year I Semester

10BT30121 : FLUID MECHANICS AND HYDRAULIC MACHINERY

L	P	T	C
4	1	-	4

UNIT-I : PROPERTIES OF FLUIDS AND PRESSURE MEASUREMENT

Dimensions and units: physical properties of fluids- mass density, specific weight, specific volume - specific gravity, viscosity surface tension- capillarity, bulk modulus, compressibility-ideal and real fluids- Newtonian and non Newtonian fluids - vapor pressure and its influence on fluid motion- atmospheric gauge and vacuum pressure -measurement of pressure- Piezometer, U-tube and differential manometers.

UNIT-II : FLUID KINEMATICS AND DYNAMICS

Stream line, path line and streak lines and stream tube, classification of flows-steady & unsteady, uniform, non uniform, laminar, turbulent, rotational, and irrotational flows-equation of continuity for one dimensional flow. Surface and body forces -Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its application on force on pipe bend.

UNIT-III : FLOW THROUGH PIPES AND ITS MEASUREMENT

Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line. Measurement of flow: pilot tube, venturimeter, and orifice meter, Flow nozzle-power transmission through transmission through pipes.

UNIT-IV : IMPACT OF JETS

Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes.

UNIT-V : HYDROELECTRIC POWER STATIONS

Layout of hydro electric power station - types-concept of pumped storage plants - storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area, heads and efficiencies.

UNIT-VI : HYDRAULIC TURBINES

Classification of turbines, impulse and reaction turbines - construction and working of Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies , hydraulic design - draft tube theory - functions and efficiency.

UNIT-VII : PERFORMANCE OF HYDRAULIC TURBINES

Geometric similarity, Performance under unit head - specific speed - characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer.

UNIT-VIII : PUMPS

Classification, working, work done - manometric head- losses and efficiencies, specific speed - pumps in series and parallel-performance characteristic curves, Net Positive Suction Head - Reciprocating pumps - Working, Discharge, slip, indicator diagrams, Machinery.

TEXT BOOKS:

1. Modi and Seth, *Hydraulics, fluid mechanics and Hydraulic Machinery,* 18th edition, Standard book house, New Delhi.
2. Rajput, *Fluid Mechanics and Hydraulic Machines*, 4th edition, S. Chand Publications, New Delhi.

REFERENCE BOOKS:

1. D.S. Kumar, *Fluid Mechanics and Fluid Power Engineering*, 2nd edition, Kotaria & Sons.
2. R.K. Bansal, *Fluid Mechanics and Hydraulic Machinery,* 9th edition, Laxmi Publications Pvt., Ltd., New Delhi.

B.Tech. II Year I Semester

10BT30401 : SEMICONDUCTOR DEVICES AND CIRCUITS

(Common to EEE, ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : PN JUNCTION DIODE

PN junction diode equation, Volt-Ampere (V-I) characteristics, temperature dependence of V-I characteristics, ideal versus practical, static and dynamic resistances, diode equivalent circuits, junction capacitances, break down mechanisms in semiconductor diodes, Zener diode characteristics.

UNIT-II : RECTIFIERS, FILTERS AND REGULATORS

Halfwave rectifier and fullwave rectifiers (Qualitative and quantitative analysis), harmonic components in a rectifier circuit, inductor filter, capacitor filter, L - section filter, $\prod$ - section filter, comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Problems on rectifier circuits.

UNIT-III : BIPOLAR JUNCTION TRANSISTOR

Transistor construction, BJT operation, transistor as an amplifier, transistor currents and their relations, input and output characteristics of a transistor in common emitter, common base and common collector configurations, BJT specifications.

UNIT-IV : TRANSISTOR BIASING AND STABILIZATION

Operating point, DC and AC load lines, importance of biasing, fixed bias, emitter feedback bias, collector to emitter feedback bias, voltage divider bias, bias stability, stabilization against variations in V_{BE} and β, bias compensation using diodes and transistors, thermal runaway, condition for thermal stability in CE configuration, problems on biasing circuits.

UNIT-V : SMALL SIGNAL ANALYSIS OF BJT AMPLIFIERS

BJT Modeling, hybrid modeling, determination of h-parameters from transistor characteristics, measurement of h-parameters, analysis of CE, CB and CC configurations using h-parameters, comparison of CB, CE and CC configurations, simplified hybrid model, Millers theorem, dual of Millers theorem.

UNIT-VI : FIELD EFFECT TRANSISTOR

Construction, principle of operation and characteristics of JFET and MOSFET (enhancement & depletion), small signal model of JFET and MOSFET.

UNIT-VII : FET AMPLIFIERS

Common source and common drain amplifiers using FET, generalized FET amplifier, biasing of FET, FET as voltage variable resistor, comparison between BJT and FET.

UNIT-VIII : SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of operation and characteristics of tunnel diode, uni-junction transistor (UJT), varactor diode, Silicon Control Rectifier (SCR). principle of operation of Schottky barrier diode.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits,* 1991 edition, Tata McGraw-Hill, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits,* 9th edition, Prentice Hall India, 2006.
3. David A. Bell, *Electronic Devices and Circuits,* 5th edition, Oxford University press, 2008.

REFERENCE BOOKS:

1. J. Millman and C.C. Halkias, *Integrated electronic*, 2nd edition, Tata McGraw-Hill, 1998.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2nd edition, BSP, 2005.
3. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7th edition, Prentice Hall India, 2005.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd edition, Tata McGraw-Hill, 2008.
5. Henry and Jeager, *Semiconductor Devices and Circuits,* Mc-Graw Hill.

B.Tech. II Year I Semester

10BT40404: SWITCHING THEORY AND LOGIC DESIGN

(Common to EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : NUMBER SYSTEMS & CODES
Philosophy of number systems – complement representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

UNIT-II : BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS
Fundamental postulates of boolean algebra, basic theorems and properties, switching functions, canonical and standard forms, algebraic simplification, digital logic gates, properties of XOR gate, universal gates, multilevel NAND/NOR realizations.

UNIT-III : MINIMIZATION OF SWITCHING FUNCTIONS
Map method, prime implicants, don't care combinations, minimal SOP and POS forms, tabular method, prime-implicant chart, simplification rules.

UNIT-IV : COMBINATIONAL LOGIC DESIGN
Design using conventional logic gates- binary adders, subtractors, look ahead carry generator, decimal adder-BCD adder, binary multiplier, modular design using IC chips- magnitude comparator, encoder, decoder, multiplexer- MUX realization of switching functions, De-multiplexer, parity bit generator, code-converters, hazards and hazard free realizations.

UNIT-V : PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC
Basic PLD's-ROM, PROM, PLA, PAL, realization of switching functions using PLD's, capabilities and limitations of threshold gate, synthesis of threshold functions, multigate synthesis.

UNIT-VI : SEQUENTIAL CIRCUITS - I
Classification of sequential circuits (synchronous, asynchronous, pulse mode, level mode with examples), basic flip-flops, triggering and excitation tables, steps in synchronous sequential circuit design, design of synchronous counters – modulo-N, up/down counter, ring counter, Johnson counter, design of asynchronous counter-modulo-N , sequence detector, serial binary adder.

UNIT-VII : SEQUENTIAL CIRCUITS - II
Finite state machine-capabilities and limitations, Mealy and Moore models, minimization of completely specified and incompletely specified sequential machines, partition techniques and Merger chart methods, concept of minimal cover table.

UNIT-VIII : ALGORITHMIC STATE MACHINES

Salient features of the ASM chart, Simple examples, system design using data path and control subsystems, control implementations, examples of weighing machine and binary multiplier.

TEXT BOOKS:

1. Morris Mano, *Digital Design,* 3rd edition, Prentice Hall India.
2. Zvi Kohavi, *Switching & Finite Automata theory,* 2nd edition, Tata McGraw-Hill.

REFERENCE BOOKS:

1. Charles H. Roth, *Fundamentals of Logic Design*, 5th edition, Thomson Publications, 2004.
2. Fletcher, *An Engineering Approach to Digital Design,* 1st edition, Prentice Hall India, 2005.
3. John M. Yarbrough, *Digital Logic Applications and Design,* Thomson Publications, 2006.
4. A Anand Kumar, *Switching Theory and Logic Design,* Prentice Hall India, 2008.

B.Tech. II Year I Semester

10BT30201 : ELECTRICAL CIRCUITS

L	T	P	C
4	1	-	4

UNIT-I : FUNDAMENTALS OF ELECTRICAL CIRCUITS
Concepts of charge, current, voltage and power, active & passive elements, reference concepts of direction for voltages & currents, voltage and current relationships for passive elements, Ohm's law, Kirchoff Laws, current division and voltage division rules, Network reduction techniques - series, parallel, series-parallel circuits, star-delta and delta-star transformations, source transformation.

UNIT-II : BASIC NODAL & MESH ANALYSIS
Basic definitions: node, path, loop, branch - nodal analysis and super node concept - mesh analysis and super mesh concept - problems.

UNIT-III : FUNDAMENTALS OF AC CIRCUITS
Introduction - advantages of AC supply, types of waveforms, importance of sinusoidal waveforms, basic definitions: waveform, cycle, time period, frequency, amplitude- determination of average, RMS value, form factor & peak factor for different alternating waveforms, phase and phase difference.

UNIT-IV : SINGLE PHASE AC CIRCUITS
Sinusoidal response of R, L, C and combination of R, L, C circuits, concept of impedance and power triangles, power factor, resonance, bandwidth and quality factor for series and parallel networks, locus diagram.

UNIT-V: POLYPHASE SYSTEMS
Advantages of polyphase system over single phase system, phase sequence, star & delta connections, relationship between phase and line quantities, balanced and unbalanced circuits, power measurement in three phase systems using two wattmeter method-problems.

UNIT-VI : MAGNETICALLY COUPLED CIRCUITS
Coupled circuits, self & mutual inductance, DOT convention, co-efficient of coupling, analysis of magnetic circuits: series, parallel and composite, comparison of electrical and magnetic circuits.

UNIT-VII : NETWORK THEOREMS - I

Thevenin's, Norton's, Maximum Power Transfer and Superposition theorems for DC and sinusoidal excitations-applications.

UNIT-VIII : NETWORK THEOREMS - II

Tellegen's, Millman's, Reciprocity, Substitution and Compensation theorems for DC and sinusoidal excitation-applications.

TEXT BOOKS:

1. A. Sudhakar & Shyam Mohan, *Electric Circuits,* 3rd Edition, McGraw Hill Company, 2007.
2. A. Chakrabarthi, *Circuit Theory*, Dhanpat Rai & Co, New Delhi, 2009.

REFERENCE BOOKS:

1. M.E. Van Valkenberg, *Network Analysis*, Pearson Publications, 3rd edition, New Delhi 2006.
2. William H. Hayt & Jack E. Kennedy & Steven M. Durbin, *Engineering Circuit Analysis*, 6th edition, Tata Mc GrawHill Company, 2009.
3. J.A. Edminister & M.D.Nahvy, *Theory and Problems of Electric Circuits, Schaums Outline series*,4th edition, TATA Mc Graw Hill company, New Delhi, 2004.
4. G. K. Mittal, Ravi Mittal, *Network Analysis*, 14th Edition, Khanna Publishers, New Delhi, 1997.
5. C. K. Alexander and M. N. O. Sadiku, *Fundamentals of Electric Circuits,* 3rd Edition, Tata Mc Graw hill Publishing Company Limited, New Delhi, 2010.

B.Tech. II Year I Semester

10BT30202 : DC MACHINES

L	T	P	C
4	1	-	4

UNIT-I : ELECTROMECHANICAL ENERGY CONVERSION

Electromechanical energy conversion, forces and torque in magnetic field systems, energy balance, energy and force in a singly excited magnetic field system, determination of magnetic force and co-energy, multi excited magnetic field systems.

UNIT-II : DC GENERATORS - CONSTRUCTION & OPERATION

DC Generators - principle of operation, function of commutator, constructional features, armature windings: lap and wave windings, simplex and multiplex windings, single and multi layer windings, equalizer rings and dummy coils, EMF equation, losses- constant & variable losses, calculation of efficiency, condition for maximum efficiency, reduction of losses - problems.

UNIT-III: TYPES OF DC GENERATORS

Methods of excitation - separately excited and self excited generators, build-up of EMF, critical field resistance and critical speed, causes for failure of self excitation and remedial measures.

UNIT-IV : ARMATURE REACTION IN DC MACHINES

Armature reaction, cross magnetizing and demagnetizing AT/pole, compensating winding, commutation, reactance voltage, methods of improving commutation-problems.

UNIT-V : CHARACTERISTICS OF DC GENERATORS AND PARALLEL OPERATION

Load characteristics of shunt, series and compound generators, parallel operation of DC generators, use of equalizer bar and cross connection of field windings, load sharing-problems.

UNIT-VI : DC MOTORS

DC Motors - principle of operation, back EMF, torque equation, characteristics and applications of shunt, series and compound motors, armature reaction and commutation-problems.

UNIT- VII : SPEED CONTROL OF DC MOTORS

Speed control of DC motors (Shunt & Series), armature voltage and field flux control methods, Ward-Leonard system, 3-point and 4-point starters - problems.

UNIT-VIII : TESTING OF DC MACHINES

Brake test, Swinburne's test, Hopkinson's test, Field's test, Retardation test, separation of stray losses - problems.

TEXT BOOKS:

1. JB Gupta, *Theory and Performance of Electrical Machines (DC Machines, Polyphase circuits & AC Machines) in SI Units,* 14th edition, S.K. KATARIA & Sons, New Delhi, 2006.
2. I.J. Nagrath & D.P. Kothari, *Electric Machines*, 7th edition, Tata McGraw-Hill Publishers, New Delhi, 2005.

REFERENCE BOOKS:

1. Albert E Clayton & N N Hancock, *Performance and Design of Direct Current Machines*, 3rd edition, CBS Publishers, New Delhi, 2004.
2. S.K. Bhattacharya, *Electrical Machines*, Tata McGraw-Hill Publish ers, New Delhi, 2001.
3. P.S. Bimbhra, *Electrical Machinery*, 7th edition, Khanna Publishers Delhi, 2005.
4. A.E. Fitzgerald, C.Kingsley and S.Umans, *Electric Machinery*, 6th edition, McGraw-Hill Companies, New Delhi, 2008.

B.Tech. II Year I Semester

10BT40112 : FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

L	T	P	C
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Any TWELVE experiments are to be conducted

1. Calibration of venturimeter
2. Calibration of orificemeter
3. Determination of coefficient of discharge for small orifice by con stant head method
4. Determination of coefficient of discharge for external mouthpiece by variable head method
5. Calibration of rectangular notch
6. Calibration of triangular notch
7. Determination of loss of head due to sudden contraction
8. Determination of loss of head due to sudden expansion
9. Determination of friction factor for pipes
10. Verification of Bernoulli's equation
11. Impact of jet on vanes
12. Study of hydraulic jump
13. Performance test on Pelton wheel turbine
14. Performance test on Francis turbine
15. Performance test on Kaplan turbine
16. Performance test on single stage centrifugal pump
17. Performance test on multi stage centrifugal pump
18. Performance test on reciprocating pump

B.Tech. II Year I Semester

10BT30211 : DC MACHINES LAB

L	T	P	C
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PART A: (for demo only):

1. Demonstration of parts of DC Machine-explaining their significance and the materials used
2. Demonstration of DC windings
3. Study of DC motor starters

The following experiments are required to be conducted as compulsory experiments:

PART B:

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed
2. Load test on DC shunt generator. Determination of characteristics
3. Load test on DC series generator. Determination of characteristics
4. Load test on DC compound generator (cumulative and differential connection). Determination of characteristics
5. Hopkinson's test on DC shunt machines. Predetermination of efficiency
6. Field's test on DC series machines. Determination of efficiency
7. Swinburne's test on DC shunt machine. Predetermination of efficiencies
8. Speed control of DC shunt motor by
   a. Armature control method
   b. Field flux control method
9. Brake test on DC compound motor. Determination of performance curves.
10. Brake test on DC shunt motor. Determination of performance curves
11. Brake test on DC series motor. Determination of performance curves
12. Separation of losses in DC shunt machine

B.Tech. II Year II Semester

10BT40421 : ANALOG ELECTRONIC CIRCUITS

L	T	P	C
4	-	-	4

UNIT-I : SINGLE STAGE AMPLIFIERS

Classification of amplifiers – distortion in amplifiers, analysis of CE, CC and CB configurations with simplified hybrid model, analysis of CE amplifier with emitter resistance and emitter follower, design of single stage RC coupled amplifier using BJT.

UNIT-II : BJT FREQUENCY RESPONSE

Logarithms, decibels, general frequency considerations, frequency response of BJT amplifier, analysis at low and High frequencies, Effect of coupling and bypass capacitors, the hybrid –Pi (π) – common emitter transistor model, CE short circuit current gain, current gain with resistive load, single stage CE transistor amplifier response, gain – bandwidth product, emitter follower at higher frequencies.

UNIT-III : FEEDBACK AMPLIFIERS

Concept of feedback, classification of feedback amplifiers, general characteristics of negative feedback amplifiers, effect of feedback on amplifier characteristics- voltage series- voltage shunt, current series and current shunt feedback configurations- simple problems.

UNIT-IV : OSCILLATORS

Conditions for oscillations, RC and LC type oscillators, crystal oscillators, frequency and amplitude stability of oscillators, feneralized analysis of LC oscillators, Quartz, Hartley and Colpitts oscillators, RC-phase shift and Wein- bridge oscillator

UNIT-V : LARGE SIGNAL AMPLIFIERS

Class-A aower amplifier, maximum value of efficiency of class-A amplifier, transformer coupled amplifier- push pull amplifier- complimentary symmetry circuits (Transformer less class B power amplifier)- phase inverters, transistor power dissipation, thermal runway, heat sinks.

UNIT-VI : LINEAR AND NON – LINEAR WAVE SHAPING

Linear wave shaping: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs.

Non- linear wave shaping: Diode clippers, transistor clippers, clipping at two independent levels, comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and diode resistances into account, clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage.

UNIT-VII : SWITCHING CHARACTERISTICS OF DEVICES

Diode as a switch, piecewise linear diode characteristics, Diode switching times, transistor as a switch, break down voltages, transistor in saturation, temperature variations of saturation parameters, transistor-switching times, silicon-controlled-switch circuits.

UNIT-VIII : MULTIVIBRATOR CIRCUITS

Analysis and design of bistable, monostable, astable multivibrators and schmitt trigger

Circuit using BJT, concept of triggering, symmetrical and asymmetrical configurations.

TEXT BOOKS:

1. Jacob Milliman, Christors C Halkias, *Integrated Electronics,* 1s edition, Tata McGraw-Hill, 2004.
2. R. L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits*, 9th edition, Pearson Education, 2007.
3. J. Millman and H. Taub, *Pulse, Digital and Switching Waveforms*, McGraw-Hill, 1991.

REFERENCE BOOKS:

1. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd edition, Tata McGraw-Hill, 2008.
2. David A. Bell, *Solid State Pulse Circuits*, 4th edition, Prentice Hall of India, 2002.
3. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7th edition, Prentice Hall India, 2005.
4. A. Anand Kumar, *Pulse and Digital Circuits*, 2nd edition, Prentice Hall India, 2005.

B.Tech. II Year II Semester

10BT40201 : NETWORK ANALYSIS AND SYNTHESIS

L	T	P	C
4	-	-	4

UNIT-I : NETWORK TOPOLOGY

Concept of network graph, basic definitions: branch, graph, tree, node, twigs, links-properties of a tree, incidence matrix - properties, reduced incidence matrix- cutset and tieset matrices - examples, Dual networks.

UNIT-II : FOURIER SERIES

Introduction-trigonometric Fourier series, evaluation of Fourier coefficients, waveform symmetry, Exponential form, effective value, Fourier transforms, effective value of non sinusoidal wave, relationship with Laplace transforms.

UNIT-III : LAPLACE TRANSFORMS

Definition of Laplace transform, advantages, basic theorems(differentiation and integration), Laplace transform of important functions, inverse Laplace transform, transform impedance of network elements (R, L & C), application of Laplace transform- series RL, RC, RLC, parallel RLC circuits, initial and final value theorem.

UNIT-IV : TWO PORT NETWORKS

Two port networks - Z-parameters, Y-parameters, ABCD parameters and H-parameters - symmetry and reciprocity property in two port networks - interrelationships of different parameters , interconnection of two port networks.

UNIT-V : DC TRANSIENT ANALYSIS

Transient response of RL, RC and RLC series circuits- initial conditions- solution method using differential equation and Laplace transforms, response of RL and RC networks to pulse excitation.

UNIT-VI : AC TRANSIENT ANALYSIS

Transient response of RL, RC and RLC series circuits - initial conditions-solution method using differential equation and Laplace transforms.

UNIT-VII : NETWORK FUNCTIONS

Introduction -network functions, determinants and co-factors for determining network function , necessary conditions for driving point function and transfer functions, applications of network analysis in deriving network functions, transient response.

UNIT-VIII : NETWORK SYNTHESIS

Introduction - positive real functions, driving point and transfer impedance function, LC network, synthesis of dissipative networks, two terminal RL and RC network.

TEXT BOOKS:

1. A. Sudhakar, Shyammohan S Palli, *Circuits and Networks (Analysis and Synthesis)*, 3rd edition, Tata McGraw-Hill Publishing.
2. D. Roy Chowdary, *Networks and Systems*, 1st Edition, New Age International Publishers.

REFERENCE BOOKS:

1. A. Chakrabarthi, *Circuit Theory (Analysis and Synthesis)*, 1st edition, Dhanpat Roi & Co. New Delhi, 2009.
2. M.E. Van Valkenburg, *Network Analysis*, 3rd edition, Prentice Hall India.
3. William H Hayt, Jr. Jack E. Kemmerly, Steven M. Durbin, *Engineering Circuit Analysis*, 6th edition, Tata McGraw-Hill publishing Company Ltd.,
4. Umesh Sinha, *Network Analysis and Synthesis*, 5th edition, Satyaprakashan, New Delhi.

B.Tech. II Year II Semester

10BT40202 : ELECTROMAGNETIC FIELDS

L	T	P	C
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REVIEW OF VECTOR ALGEBRA:
Scalar and vector fields, Vector algebra, Cartesian, Circular Cylindrical and Spherical co-ordinate systems, Divergence Theorem, Stoke's Theorem

UNIT-I : ELECTROSTATICS
Electrostatic fields-Coulomb's law, Electric Field Intensity (EFI), various charge distributions, EFI due to a continuous line charge, surface charge and volume charge distribution, electric flux density,Gauss's Law, applications of Gauss law to symmetrical charge distributions and differential volume element, Maxwell's first equation (point and integral form).

UNIT-II : ENERGY & POTENTIAL IN ELECTRIC FIELDS
Energy expended in moving a point charge in an electric field, Maxwell's second equation (point and integral form), concept of potential and potential gradient-potential for different charge distributions, energy density in electrostatic fields, electric dipole, dipole moment, potential and EFI due to an electrical dipole, torque on an electric dipole in an electric field.

UNIT-III : CONDUCTORS, DIELECTRICS AND CAPACITANCE
Current density, conduction and convection current density, Ohm's law in point form, current continuity equation, conductors and dielectric materials, behaviour of conductors in an electric field, boundary conditions, polarization, capacitance, capacitance of parallel plate, spherical and co-axial capacitors with composite dielectric Laplace and Poisson's equations, solutions of Laplace equation in one variable.

UNIT-IV : MAGNETOSTATICS
Static magnetic fields - Biot-Savart's law, Oesterd's experiment, Magnetic Field Intensity(MFI), MFI due to a straight current carrying filament, circular, square, solenoid and toroid current carrying wire, relation between magnetic flux, magnetic flux density and MFI, Maxwell's third equation (point and integral form), magnetic dipole and dipole moment, torque on a current loop placed in a magnetic field.

UNIT-V : AMPERE'S CIRCUITAL LAW AND ITS APPLICATIONS

Ampere's Circuital law, Maxwell's fourth equation(point and integral form), applications of Ampere's circuital law to infinite line current, infinite sheet of current, infinitely long co-axial transmission line, solenoid and toroid, field due to a circular loop, rectangular and square loops, scalar magnetic potential and its limitations, vector magnetic potential due to simple configurations, vector Poisson's equation.

UNIT-VI : FORCE IN MAGNETIC FIELDS

Magnetic forces, forces due to magnetic fields, force: on charged particle, current element and between two current elements - Lorentz force equation, force on a straight and long current carrying conductor in a magnetic field, force between two straight, long and parallel current carrying conductors, magnetic dipole and dipole moment, torque on a current loop placed in a magnetic field.

UNIT-VII : MAGNETIC MATERIALS AND INDUCTANCE

Magnetization, classification of magnetic materials, B-H curve, magnetic boundary conditions, self and mutual inductance,coefficient of coupling(K), Neumann's formulae, self-inductance of a solenoid, toroid, co-axial cable, two wire transmission line, energy stored and density in magnetic field, analogy between Electric and magnetic circuits.

UNIT-VIII : TIME VARYING FIELDS

Time varying fields, Faraday's laws of electromagnetic induction,displacement current, statically and dynamically induced EMF, Maxwell's four equations in point and integral form for time varying fields - simple problems, Poynting theorem and Poynting vector.

TEXT BOOKS:

1. William H. Hayt & John A. Buck, *Engineering Electromagnetics*, 7th edition, McGraw-Hill Companies, 2006.
2. Sadiku, *Elements of Electro Magnetic Fields*, 4th edition, Oxford Publications.

REFERENCE BOOKS:

1. J D Kraus, *Electromagnetics*, 4th edition, McGraw-Hill, 1992.
2. K.A.Gangadhar & P.M. Ramanathan, *Field Theory*, 5th edition, Khanna Publishers, New Delhi, 2003.

B.Tech. II Year II Semester

10BT40203 : GENERATION OF ELECTRIC POWER

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UNIT-I : INTRODUCTION

Overview of conventional and non-conventional sources of energy, structure of electric power system, growth of power system in India, requirements of an electric power system, concept of GRID formation, different types of energy sources and efficiency in their use.

UNIT-II : HYDROELECTRIC POWER STATIONS

Location of hydroelectric power station, types of hydroelectric power stations, reserve plant components, concept of pumped storage plants, storage requirements, mass curve.

UNIT-III : THERMAL POWER STATIONS

Layout of thermal plant, use of lignite and coal, showing paths of coal, steam, water, air, ash and flue gases, brief description of thermal power station components: economizer, boilers, super heaters, turbines and condenser, chimney and cooling towers.

UNIT-IV : NUCLEAR POWER STATIONS

Nuclear fission, chain reaction, principle of operation of nuclear reactor, nuclear fuel, moderator, control rods, reflectors and coolants, shielding and safety precautions, radiation hazards, nuclear reactors, PWR, BWR and breeder reactor, overview of gas power stations: principle of operation and components.

UNIT-V : DISTRIBUTION SYSTEMS

Classification of distribution systems-comparison of DC and AC, AC single phase and three phase three wire and four wire systems, Kelvin's law, most economical size of conductor, voltage drop calculations(numerical problems) in AC and DC for radial and ring main distribution.

UNIT-VI: SUBSTATIONS

Classification of substations: indoor and outdoor substation, substation layouts, various equipment of substations, bus bar arrangements: single sectionalized, main and transfer, ring main and group switching schemes, line diagram of gas insulated substations, working mechanism, comparison of air insulated substations and gas insulated substations.

UNIT-VII : ECONOMIC ASPECTS OF POWER GENERATION

Load curve, load duration and integrated load duration curve, load, demand - diversity - capacity - utilization and Plant use factors.

Costs of generation - depreciation - methods of calculations - Tariffs - flat rate - block rate - two part - three part and power factor tariffs - numerical problems

UNIT-VIII: POWER FACTOR IMPROVEMENT

Disadvantages of low power factor - methods of improving power factor - static capacitors, synchronous condensers and phase advancers - most economical power factor for constant kW and constant kVA type loads.

TEXT BOOKS:

1. V.K.Mehta and Rohith Mehta, *Principles of Power Systems*, Schand & Company Ltd, New Delhi 2004.
2. M.L.Soni, P.V.Gupta, U.S.Bhatnagar and A.Chakraborti, *A Text Book on Power System Engineering,* Dhanpat Rai & Co. Pvt. Ltd., 1999.

REFERENCE BOOKS and WEBSITE:

1. C.L.Wadhwa, *Electrical Power Systems*, New Age international (P) limited, 2005.
2. M.V.Deshpande, *Elements of Power Station Design and Practice*, Wheeler publishing, 1999.
3. http://www.nlcindia.com.

B.Tech. II Year II Semester

10BT40204 : ELECTRICAL MEASUREMENTS

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4	1	-	4

UNIT-I : DC MEASUREMENTS

Measurements-significance of measurements, methods of measurements, classification of instruments, D' Arsonval galvanometer, deflecting, control and damping torques, types of damping systems, ammeters and voltmeters, PMMC, errors and compensations, extension of range using shunts and series resistance, Ballistic galvanometer constructional details, equation of motion - problems.

UNIT-II : AC MEASUREMENTS

Moving iron type instruments, expression for deflecting torque and control torque, extension of range using shunts and series impedances, Errors and Compensations, electrostatic voltmeters, electrometer type and attracted disc type, extension of range of electrostatic voltmeters.

Instrument transformers- CT & PT - ratio and phase angle errors, constructional details, characteristics of CT and PT, Testing of CT's-Silsbee's method, variable mutual induction methods-problems.

UNIT-III : MEASUREMENT OF POWER

Power measurements in DC circuits, single phase dynamometer wattmeter, LPF and UPF, double element and three element dynamometer wattmeter, constructional details, expression for deflecting and control torques, errors and compensations, extension of range of wattmeter using instrument transformers, Measurement of three phase active and reactive powers in balanced and unbalanced systems-problems.

UNIT-IV : MEASUREMENT OF ENERGY

Single phase induction type energy meter, driving and braking torques, errors and compensations, testing by phantom loading using RSS meter, three phase energy meter, trivector meter, maximum demand meters-problems.

UNIT-V : DC AND AC POTENTIOMETERS

Crompton potentiometer, principle and operation of DC Crompton's potentiometer, standardization, applications of DC potentiometer for measurement of resistance, calibration of ammeter, voltmeter and wattmeter - problems.

AC Potentiometers: Polar and coordinate potentiometers, AC potentiometer Standardization, applications of AC Potentiometer for calibration of voltmeter, ammeter - problems.

UNIT-VI : RESISTANCE MEASUREMENTS

Method of measuring low, medium and high resistances, sensitivity of Wheatstone's bridge, Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, measurement of high resistance, loss of charge method, ohmmeter, Meggar for measurement of earth and insulation resistance - problems.

UNIT-VII : AC BRIDGES

Measurement of inductance, quality factor, Maxwell's bridge, Hay's bridge, Anderson's bridge, Owens's bridge. Measurement of capacitance and loss angle, Desauty's bridge, Wien's bridge, Schering bridge, Modified Schering bridge, loss factor - problems.

UNIT-VIII : SPECIAL INSTRUMENTS

Power factor meters, dynamometer and moving iron type, single phase and three phase meters, frequency meters, resonance type and Weston type, synchroscopes.

Flux meter, constructional details, comparison with ballistic galvanometer, extension of flux meter, determination of B-H curve method of reversals, step by step method.

Concepts of: LVDT, RVDT, Q-meter, transducers, thermocouple, strain gauges, digital voltmeter.

TEXT BOOKS:

1. A.K.Sawhney, *A Course in Electrical and Electronic Measurements and Instrumentation,* Danpat Rai Publishers, 2010.
2. Golding & F.C.Widdis, *Electrical Measurements and Measuring Instruments*, 5th edition, Wheeler Publishers, 1997.

REFERENCE BOOKS:

1. R. K. Rajput, *Electrical & Electronic Measurement & Instrumen tation,* 2nd Edition, S. Chand & Co.
2. Reissland, *Electrical Measurements: Fundamentals, Concepts and Applications,* New Age International Publishers, 2006.
3. Forest K. Harris, *Electrical Measurements,* Wiley, John & Sons, 1984.
4. J.B. Gupta, *Electrical Measurements,* S.K.Kataria publishers, 2004.
5. H. S. Kalsi, *Electronic Instrumentation*, 3rd Edition, Tata McGraw-Hill, 1996.

B.Tech. II Year II Semester

10BT40205 : TRANSFORMERS AND INDUCTION MACHINES

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4	1	-	4

UNIT-I : CONSTRUCTION AND OPERATION OF SINGLE PHASE TRANSFORMERS

Single phase transformers-types , constructional details, minimization of hystersis and eddy current losses, emf equation, operation on no load and on load - phasor diagrams.

UNIT-II : PERFORMANCE OF SINGLE PHASE TRANSFORMERS

Equivalent circuit, losses and efficiency, regulation - All day efficiency, effect of variations of frequency and supply voltage on iron losses.

UNIT-III : TESTING OF SINGLE PHASE TRANSFORMER AND AUTOTRANSFORMER

OC and SC tests, Polarity test, Sumpner's test, predetermination of efficiency and regulation, separation of losses test, parallel operation with equal and unequal voltage ratios, auto transformers, equivalent circuit, comparison with two winding transformers.

UNIT-IV : THREE PHASE TRANSFORMERS

Three phase transformers - three phase connections - star/star, delta/star, delta/delta, star/delta and open delta , third harmonic in phase voltages, three winding transformers-tertiary windings, determination of Z_p, Z_s and Z_t, off load and on load tap changing, Scott connection - Problems.

UNIT-V : THREE PHASE INDUCTION MOTORS

Three phase induction motors, construction details of cage and wound rotor machines, production of rotating magnetic field, principle of operation, rotor emf and rotor frequency, rotor reactance, rotor current and power factor at standstill and during operation - problems.

UNIT-VI : INDUCTION MOTOR CHARACTERISTICS

Rotor power input, rotor copper loss and mechanical power developed and their inter relation, torque equation,deduction from torque equation, expressions for maximum torque and starting torque,torque slip characteristic, double cage and deep bar rotors,equivalent circuit, phasor diagram, crawling and cogging.

UNIT-VII : CONSTRUCTION OF CIRCLE DIAGRAM

Circle diagram, no-load and blocked rotor tests, stator resistance test,predetermination of performance, methods of starting and starting current and torque calculations.

UNIT-VIII : INDUCTION MOTOR SPEED CONTROL METHODS

Speed control:change of frequency, change of poles and methods of consequent poles, cascade connection, injection of an emf into rotor circuit (qualitative treatment only), induction generator - principle of operation - problems.

TEXT BOOKS:

1. JB Gupta, *Theory and performance of Electrical Machines (DC machines, Poly phase circuits & AC machines) in SI Units*, S.K. KATARIA & Sons,Delhi 2009.
2. P.S. Bimbhra, *Electrical Machinery,* 7th edition, Khanna Publishers, Delhi, 2005.

REFERENCE BOOKS:

1. A.E. Fitzgerald, C.Kingsley and S.Umans, *Electric Machinery*, 6th edition, Mc Graw-Hill Companies, New Delhi, 2008.
2. I.J. Nagrath & D.P.Kothari, *Electric Machinery,* 7thedition, Tata McGraw-Hill, 2005.
3. MG.Say, *Performance and Design of AC Machines,* BPB Publish ers.
4. Langsdorf, *Theory of Alternating Current Machinery,*2nd edition, Tata McGraw-Hill Companies.
5. B.L. Theraja and A.K. Theraja, *A. text book of Electrical Technol ogy in SI units,* S. Chand, Vol: 2, 2010.

B.Tech. II Year II Semester

10BT30411 : SEMICONDUCTOR DEVICES

AND CIRCUITS LAB

L	T	P	C
-	-	3	2

PART A: (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs

2. Identification, Specifications and Testing of Active Devices, Diodes: BJTs, Low-power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs

3. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO

PART B: (Minimum of 10 experiments to be conducted)

1. Forward and Reverse bias characteristics of PN Junction diode
2. Zener diode characteristics and Zener as Voltage Regulator
3. Input and Output characteristics of Transistor in CB Configuration
4. Input and Output characteristics of Transistor in CE Configuration
5. Halfwave Rectifier with and without filters
6. Fullwave Rectifier with and without filters
7. FET characteristics
8. Measurement of h parameters of transistor in CE configurations
9. Frequency response of CE Amplifier
10. Frequency response of CC Amplifier
11. Frequency response of Common Source FET Amplifier
12. SCR Characteristics
13. UJT Characteristics

B.Tech. II Year II Semester

10BT40211 : ELECTRICAL CIRCUITS AND SIMULATION LAB

L	T	P	C
-	-	3	2

Any EIGHT experiments to be conducted from part A

PART A : ELECTRICAL CIRCUITS

1. Verification of Superposition and Reciprocity theorems
2. Verification of Thevenin's and Norton's theorems
3. Verification of Maximum power transfer theorems for DC & AC excitations
4. Verification of Milliman's and Compensation theorems
5. Series and parallel resonance
6. Determination of self and mutual inductance and coefficient of coupling
7. Current locus diagrams of RL & RC series circuits
8. Z & Y parameters
9. Transmission and Hybrid parameters
10. Measurement of three phase active power and reactive power for balanced loads

Any FOUR experiments to be conducted from part B

PART B : PSPICE SIMULATION

1. Simulation of DC circuits
2. DC transient response
3. Mesh analysis
4. Nodal analysis
5. Simulation of AC circuits
6. AC transient response

B.Tech. II Year II Semester

10BT4HS02 : ADVANCED ENGLISH COMMUNICATION SKILLS(Audit Course)

(Common to EEE, EIE, EConE, ECE & BOT)

L	T	P	C
0	3	0	0

UNIT-I : VOCABULARY BUILDING

Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.

Functional English: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT-II : READING COMPREHENSION

Reading for facts, guessing meanings from context, scanning, skimming, inferring meaning and critical reading.

UNIT-III : ACADEMIC ESSAY WRITING

Accuracy, brevity, clarity, brainstorm, list your ideas, sub-headings, revising content and organisation.

UNIT-IV : **TECHNICAL REPORT WRITING**

Types of formats and styles, subject-matter, subject-organization, clarity, coherence and style, planning, data-collection, tools, analysis.

UNIT-V : CAREER SKILLS

Career direction, exploring your talents, personality inventories, write a "Who I Am" statement, thinking further, perform career research, How do I get hired, creating job satisfaction, identify your satisfaction triggers, positive attitude, maintain a balanced lifestyle, analyze your job in terms of your interests, set goals to bring your interests and responsibilities in line, personal SWOT analysis, making the most of your talents and opportunities, shaping your job to fit you better, future proof your career, managing your emotions at work, get the recognition you deserve.

UNIT-VI : RESUME WRITING

Structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, cover letter.

UNIT-VII : GROUP DISCUSSION

Dynamics of group discussion, intervention, summarizing, modulation of voice, fluency and coherence, participation, relevance, assertiveness, eye contact and body language.

UNIT-VIII : INTERVIEW SKILLS

Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, *Effective Technical Communication Skills*, (2005), Tata McGraw-Hill, New Delhi.
2. Meenakshi Raman and Sangetha Sharma, *Technical Communi cation, Principles and Practice*", (2010) Oxford University Press, New Delhi.
3. Santha Kumar R, *Secrets of Success in Interviews*, (2007), Crucial Books, Secunderabad.
4. M. Ashraf Rizvi, *Resumes and Interviews - The Art of Wining*, (2008), Tata McGraw-Hill, New Delhi.
5. Gopala Swamy Ramesh and Mahadevan Ramesh,*The Ace of Soft Skills:Attitude, Communication and Etiquette for Success*, (2009), Pearson Education, New Delhi.

SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.

B.Tech. III Year I Semester

10BT3BS02 : ENVIRONMENTAL SCIENCES

(Common to EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO ENVIRONMENTAL SCIENCES

Definition and concept of the term environment, various components of environment, abiotic and biotic, atmosphere, hydrosphere, lithosphere, biosphere, inter relationships, need for public awareness, role of important national and international individuals and organizations in promoting environmentalism.

UNIT-II : NATURAL RESOURCES, CONSERVATION AND MANAGEMENT

Renewable and Non renewable resources and associated problems, Forests: Deforestation, causes, effects and remedies, effects of mining, dams and river valley projects - case studies, Water resources: Water use and over exploitation, conflicts over water, large dams, benefits and problems. Food resources : World food problems, adverse effects of modern agriculture, fertilizer and pesticide problems. Land resources: Land degradation, land slides, soil erosion, desertification, water logging, salinity, causes, effects and remedies. Mineral resources: Mining, adverse effects. Energy resources: Growing needs, renewable and non renewable resources, Alternate resources: Coal, wind, oil, tidal wave, natural gas, biomass and biogas, nuclear energy, hydrogen fuel and solar energy, impact on environment, sustainable life styles.

UNIT-III : ECOLOGY AND ECOSYSTEMS

Definitions and concepts, characteristics of ecosystem, structural and functional features, producers, consumers and decomposers and food webs, types of ecosystems, forests grassland, desert, crop land, pond, lake, river and marine ecosystems, energy flow in the ecosystem , ecological pyramids, ecological successions.

UNIT-IV : BIO DIVERSITY, CONSERVATION AND MANAGEMENT

Introduction - Definition and concept of biodiversity, value of biodiversity, role of biodiversity in addressing new millennium challenges, global, national biodiversity, hot spots of biodiversity, threats to biodiversity, man and wild life conflicts, remedial measures, endemic, endangered and extinct species, in-situ and ex-situ conservation of biodiversity.

UNIT-V : ENVIRONMENTAL POLLUTION AND CONTROL

Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution, solid waste management, causes, effects, control and disposal methods, role of individuals in the prevention of pollution, hazards and disaster management, floods, earthquakes, tsunamis, cyclones,land slides - case studies.

UNIT-VI : SOCIAL ISSUES AND THE ENVIRONMENT

Concept of sustainable development, methods of rainwater harvesting, watershed management, waste land reclamation, green cover, green power, green technology, resettlement and rehabilitation of people and related problems - Case studies, issues and possible solutions, greenhouse effect and global warming, carbon credits, acid rains, ozone layer depletion, causes, effects and remedies, consumerism and waste production, environment protection acts, air act, water act,forest conservation act, wild life protection act, issues involved in the enforcement.

UNIT-VII : HUMAN POPULATION AND ENVIRONMENT

Population growth and its impact on environment, environmental ethics, family welfare programmes, human health: T.B., Cancer, HIV/ AIDS - Causes, effects and remedies, occupational health hazards, human rights, important international protocols and conventions on environment.

UNIT-VIII : FIELD WORK/ENVIRONMENTALIST'S DIARY/ ASSIGNMENTS/SEMINARS

TEXT BOOKS:

1. Erach Barucha, *Environmental Studies*, 1st edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies*, 3rd Edition, New Age International Publishers, 2011.

REFERENCE BOOKS:

1. Desh wal, *Environmental Studies*, 2nd Edition, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1st edition, Oxford Univer sity Press, 2009.
3. Joseph Benny, *Environmental Studies*, 2nd Edition, Tata McGraw-Hill, New Delhi, 2010.

B.Tech. III Year I Semester

10BT40501 : COMPUTER ARCHITECTURE AND ORGANIZATION

(Common to EEE, ECE & EIE)

L	T	P	C
4	1	-	4

UNIT-I : STRUCTURE OF COMPUTERS

Computer types, functional units, basic operational concepts, von-Neumann architecture, bus structures, software, performance, multiprocessors and multicomputers.

Computer Arithmetic: Review of representation of information, addition and subtraction, multiplication and division algorithms, Floating- point arithmetic operation, decimal arithmetic unit, decimal arithmetic operations.

UNIT-II : REGISTER TRANSFER AND MICRO-OPERATIONS

Register transfer language, register transfer, bus and memory transfers, arithmetic micro-operations, logic micro-operations, shift micro-operations, arithmetic logic shift unit, instruction codes, computer registers, computer instructions, instruction cycle, timing and control, memory- reference instructions, input-output and interrupt.

Central Processing Unit: Stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, Reduced Instruction Set Computer (RISC), comparison of RISC and CISC.

UNIT-III : MICROPROGRAMMED CONTROL

Control memory, address sequencing, micro-program example, design of control unit, hardwired control, micro-programmed control, nanoprogramming.

UNIT-IV: PIPELINE AND VECTOR PROCESSING

Parallel processing, pipelining, arithmetic pipeline, instruction pipeline, RISC pipeline, data hazards, instruction hazards, influence on instruction sets, data path and control consideration, superscalar operations, vector processing, array processors.

UNIT-V: THE MEMORY SYSTEM

Basic concepts, semiconductor RAM, types of Read-Only Memory (ROM), cache memory, performance considerations, virtual memory, secondary storage, and introduction to Redundant Array of Inexpensive Disks (RAID).

Input-Output Organization: Peripheral devices, input-output interface, asynchronous data transfer, modes of transfer, priority interrupt, Direct Memory Access (DMA).

UNIT-VI : INPUT-OUTPUT ORGANIZATION (ADVANCED)

Input-Output Processor (IOP), Serial communication, Introduction to peripheral component Interconnect (PCI) bus, Introduction to Standard Serial Communication Protocols Like RS232, USB, and IEEE1394.

UNIT-VII : MULTIPROCESSORS

Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Cache Coherance, Shared Memory Multiprocessors.

UNIT-VIII : CASE STUDIES

CISC Architecture-Pentium IV, RISC Architecture-PowerPC.

TEXT BOOKS :

1. M. Moris Mano, *Computer System Architecture*, 3rd edition, Pearson/ Prentice Hall India, 2008.
2. William Stallings, *Computer Organization and Architecture*, 6th edition, Pearson/PHI.

REFERENCE BOOKS:

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, *Computer Organ zation*, 5th edition, McGraw-Hill, 2002.
2. Andrew S. Tanenbaum, *Structured Computer Organization,* 4th edition, Prentice Hall India/Pearson
3. Sivarama P. Dandamudi, *Fundamentals of Computer Organiza tion and Design,* Springer Int. ddition, 2003.
4. John P. Hayes, *Computer Architecture and Organization,* 3rd edition, Tata McGraw-Hill, 1998.

B.Tech. III Year I Semester

10BT41301 : CONTROL SYSTEMS

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION

Concepts of Control Systems, Open Loop and closed loop control systems, Feed-Back Characteristics, Effects of feedback, Block diagram representation of physical systems, Mathematical models-differential Equations.

UNIT-II : TRANSFER FUNCTION REPRESENTATION

Analogous systems, electrical analogy of physical systems, Derivation of transfer function, Transfer function of DC Servomotor, Synchro transmitter and receiver, Block diagram algebra, Signal Flow graph and Mason's gain formula.

UNIT-III : TIME RESPONSE ANALYSIS

Types of test signals, Response of first and second order system, Time domain specifications, type and order of systems, steady state error, static error constants, generalized error co-efficients. Effect of P, PI, PID on time response.

UNIT-IV : STABILITY ANALYSIS IN S-DOMAIN

Concepts of stability: Characteristic equation, location of roots in s-plane for stability, asymptotic stability and relative stability, Routh-Hurwitz stability criterion.

Root Locus Technique: Root locus concept, construction of root loci, effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT-V : FREQUENCY RESPONSE ANALYSIS

Introduction, Frequency domain specifications, Bode diagrams, Determination of Frequency domain specifications and transfer function from the Bode Diagram, Phase margin and Gain margin, Stability Analysis from Bode Plots.

UNIT-VI : STABILITY ANALYSIS IN FREQUENCY DOMAIN

Polar Plots, Nyquist plots, stability in frequency domain using Nyquist stability criterion, simple problems.

UNIT-VII : DESIGN AND COMPENSATION OF CONTROL SYSTEMS

Introduction to Compensation networks, Lag, Lead, lead-lag compensation, Compensation using Bode plots.

UNIT-VIII : STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS

Concepts of state, state variables and state model, derivation of state model for physical systems Diagonalization, State Transition Matrix and its Properties, Solution of linear state equation, Concepts of Controllability and Observability, Kalman's test only.

TEXT BOOKS:

1. I. J. Nagrath and M. Gopal, *Control Systems Engineering,* 2nd edition New Age International (P) Limited.
2. Katsuhiko Ogata, *Modern Control Engineering,* 3rd edition, Prentice Hall of India Pvt. Ltd.

REFERENCE BOOKS:

1. B.C.Kuo, *Automatic Control Systems*, Weilly Eastern, 2004.
2. John wiley, *Control Systems Engineering*, 3rd Edition, NISE.
3. Richard C. Dorf, Robert H. Bishop, *Modern Control Systems,*11th edition, Pearson Education, 2007.
4. Graham Goodwin, Stefan Graebe and Mario Salgado, *Control System Design,* Prentice Hall.

B.Tech. III Year I Semester

10BT50201 : POWER ELECTRONICS

L	T	P	C
4	1	-	4

UNIT-I : POWER SEMICONDUCTOR DEVICES

Thyristors, Silicon Controlled Rectifiers (SCR's), BJT, power MOSFET, power IGBT and their characteristics, basic theory and operation of SCR, static characteristics of SCR, dynamic characteristics of SCR, turn on methods for SCR.

UNIT-II : DEVICES AND COMMUTATION CIRCUITS

Two transistor analogy, SCR, R and RC triggering, UJT firing circuit, series and parallel connections of SCR's - Numerical problems, specifications and ratings of SCR's, turn off (commutation) methods for SCR.

UNIT-III : PROTECTION CIRCUITS

Protection against dv/dt and overvoltages, snubber circuit, design of snubber circuit, numerical problems, metal oxide varistors, improving dv/dt rating with the help of cathode short di/dt protection with the help of inductor, overcurrent protection, semiconductor fuses, cooling of semiconductor devices- types.

UNIT-IV : SINGLE PHASE HALF AND FULLY CONTROLLED CONVERTERS

Phase control technique, single phase line commutated converters, mid-point and bridge connections - Half and Fully controlled converters with R, RL loads and RLE load - derivation of average load voltage and current, active and reactive power inputs to the converters, effect of free wheeling diode - numerical problems.

UNIT-V : THREE PHASE LINE COMMUTATED CONVERTERS

Three phase converters - three pulse and six pulse converters - Mid point and bridge connections average load voltage with R and RL loads, effect of source inductance, dual converters (both single phase and three phase), waveforms - numerical problems.

UNIT-VI : AC VOLTAGE CONTROLLERS AND CYCLOCONVERTERS

AC voltage controllers, single phase two SCRs in anti parallel - with R and RL loads, modes of operation of Triac - Triac with R and RL loads - Derivation of RMS load voltage, current and power factor - numerical problems, cycloconverters: single phase mid point cyclo converters with resistive and inductive load (principle of operation only), bridge configuration of single phase cycloconverter (principle of operation only) - waveforms.

UNIT-VII : CHOPPERS

Choppers, time ratio control and current limit control strategies, step down choppers - derivation of load voltage and currents with R, RL and RLE loads, step up chopper - load voltage expression, Morgan's chopper, Jone's chopper, AC chopper - waveforms.

UNIT-VIII : INVERTERS

Inverters - single phase inverter, basic series inverter, basic parallel inverter, Voltage Source Inverter and Current Source Inverter, McMurray and McMurray-Bedford inverters, voltage control techniques for inverters, pulse width modulation techniques.

TEXT BOOKS:

1. M. D. Singh & K. B. Kanchandhani, *Power Electronics*, Tata Mc Graw-Hill Publishing Company, 1998.
2. P.C. Sen, *Power Electronics*, Tata McGraw-Hill Publishing Com pany, 2009.

REFERENCE BOOKS:

1. Vedam Subramanyam, *Power Electronics*, 3rd Edition, New Age International (P) Limited, 2008.
2. M. H. Rashid, *Power Electronics: Circuits, Devices and Applica tions*, 2nd edition, Prentice Hall of India, 1998.
3. G. K. Dubey, S. R. Doradla, A. Joshi and R. M. K. Sinha, *Thyristorised Power Controllers*, New Age International (P) Limited Publishers, 1996.
4. John G. Kassakian, Martin F. Schlecht and George C. Verghese, *Principles of Power Electronics*, Pearson, 2009.

B.Tech. III Year I Semester

10BT50202 : AC MACHINES

L	T	P	C
4	1	-	4

UNIT-I : CONSTRUCTIONAL DETAILS AND PRINCIPLE OF OPERATION OF SYNCHRONOUS GENERATOR

Constructional features of round rotor and salient pole machines, armature windings, integral slot and fractional slot windings, distributed and concentrated windings, distribution, pitch and winding factors, EMF equation - problems.

UNIT-II : CHARACTERISTICS OF SYNCHRONOUS GENERATOR

Harmonics in generated EMF, suppression of harmonics, armature reaction, leakage reactance, synchronous reactance and impedance, experimental determination, phasor diagram, load characteristics.

UNIT-III : REGULATION OF SYNCHRONOUS GENERATOR

Regulation by synchronous impedance method, MMF method, ZPF method and ASA method, salient pole alternators, two reaction analysis, experimental determination of X_d and X_q (Slip test), phasor diagrams, regulation of salient pole alternators.

UNIT-IV : PARALLEL OPERATION OF SYNCHRONOUS GENERATOR

Synchronizing alternators with infinite bus bars, synchronizing power and torque, parallel operation and load sharing, effect of change of excitation and mechanical power input, analysis of short circuit current wave form, determination of sub-transient, transient and steady state reactances.

UNIT-V : SYNCHRONOUS MOTORS - PRINCIPLE OF OPERATION AND CIRCLE DIAGRAM

Theory of operation, phasor diagram, variation of current and power factor with excitation, synchronous condenser, mathematical analysis for power developed, circle diagram, excitation and power circles, hunting and its suppression, methods of starting, synchronous induction motor.

UNIT-VI : SINGLE PHASE INDUCTION MOTORS

Single phase induction motor, constructional features,double revolving field theory, elementary idea of cross field theory, split phase motors, shaded pole motor.

UNIT-VII : SINGLE PHASE MOTORS

Principle & performance of AC series motor, universal motor, principle of permanent magnet and reluctance motors.

UNIT-VIII : SPECIAL MACHINES

Stepper motor - types, synchros - types, servo motors - DC and AC servo motors.

TEXT BOOKS:

1. J.B. Gupta, *Theory and Performance of Electrical Machines (DC Machines, Polyphase Circuits & AC Machines) in SI Units,* 14th edition, S.K. Kataria & Sons, New Delhi, 2006.
2. P.S. Bimbhra, *Electrical Machinery*, 7th edition, Khanna Publishers, Delhi, 2005.

REFERENCE BOOKS:

1. M.G. Say, *The Performance and Design of Alternating Current Machines,* CBS Publishers and Distributors Pvt., Ltd., 3rd Edition, New Delhi, 2002.
2. A.E. Fitzgerald, C. Kingsley and S. Umans, *Electric Machinery*, McGraw-Hill Companies, 2nd Edition, New Delhi, 2008.
3. Langsdorf, *Theory of Alternating Current Machinery*, 2nd edition, Tata Mc Graw-Hill, New Delhi, 2005.
4. I.J.Nagrath & D.P.Kothari, *Electric Machines,* 7th Edition, Tata McGraw-Hill Publishers, 2005.

B.Tech. III Year I Semester

10BT50203 : ELECTRICAL POWER TRANSMISSION

L	T	P	C
4	1	-	4

UNIT-I : TRANSMISSION LINE PARAMETERS

Types of conductors, calculation of resistance for solid conductors, calculation of inductance for single phase and three phase, single and double circuit lines, concept of GMR and GMD, symmetrical and asymmetrical conductor configuration with and without transposition, numerical problems.

Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and double circuit lines, numerical problems.

UNIT-II : PERFORMANCE OF SHORT AND MEDIUM TRANSMISSION LINES

Classification of transmission lines- short, medium and long lines and their model representations-nominal-T, nominal-$\prod$ and A, B, C, D constants for symmetrical and asymmetrical networks, numerical problems. Mathematical solutions to estimate regulation and efficiency of all types of lines- numerical problems.

UNIT-III : PERFORMANCE OF LONG TRANSMISSION LINES AND CORONA

Rigorous solution for long transmission lines- surge impedance and surge impedance loading of long lines, wave length and velocity of propagation of waves-numerical problems.

Skin, Proximity and Ferranti effects-Corona- description of the phenomenon, factors affecting corona, critical voltages and power loss, radio interference- numerical problems.

UNIT-IV : POWER SYSTEM TRANSIENTS

Types of transients- traveling or propagation of surges- attenuation, distortion, reflection and refraction coefficients- termination of lines with different types of conditions- open circuited line, short circuited line, T-junction, lumped reactive junctions- Beweley's Lattice diagram for all the cases mentioned above-numerical problems

UNIT-V : SYMMETRICAL COMPONENT THEORY

Per unit system representation, per unit equivalent reactance network of a three phase power system, numerical problems, symmetrical component theory: voltages, currents and impedances. symmetrical component transformation, sequence networks: positive, negative and zero sequence networks, numerical problems.

UNIT-VI : OVERHEAD LINE INSULATORS

Line supports, different types, wooden, RCC poles and steel towers, types of insulators, string efficiency and methods for improvement, numerical problems, voltage distribution, calculation of string efficiency, capacitance grading and static shielding - numerical problems.

UNIT-VII : SAG AND TENSION CALCULATIONS

Sag and tension calculations with equal and unequal heights of towers, effect of wind and ice on weight of conductor, numerical problems, stringing chart and sag template and their applications, vibrations and dampers.

UNIT-VIII : UNDER GROUND CABLES

Types of cables, construction, types of insulating materials, calculations of insulation resistance and stress in insulation, numerical problems.

Capacitance of single and 3-core belted cables, numerical problems, grading of cables, capacitance grading, numerical problems, description of inter sheath grading.

TEXTBOOKS:

1. M.L.Soni, P.V.Gupta, V.S. Bhatnagar, A.Chakravarthy, *A Text Book on Power System Engineering,* Dhanpat Rai and Co Private Ltd., 2007.
2. C.L.Wadhwa, *Electrical Power Systems*, 3rd edition, New Age International(P)Limited, publishers, 2005.

REFERENCE BOOKS:

1. John J Grainger William D Stevenson, *Power System Analysis,* 4th Edition, *TMC Companies*, 2003.
2. B.R.Gupta, *Power System Analysis and Design*, 3rd edition, Wheeler Publishers, 1999.
3. Hadi Saadat, *Power System Analysis*, 6th reprint, Tata McGraw-Hill Edition, 2005.
4. I.J.Nagrath and D.P.Kothari, *Modern Power System Analysis*, 3rd edition, Tata McGraw-Hill, 2003.

B.Tech. III Year I Semester

10BT50211: TRANSFORMERS AND AC MACHINES LAB

L	T	P	C
-	-	3	2

The following experiments are required to be conducted as compulsory experiments:

1. OC and SC tests on single phase transformer
2. Sumpner's test on a pair of single phase transformers
3. Scott connection of transformers
4. No-load & blocked rotor tests on three phase induction motor
5. Regulation of a three-phase alternator by EMF and MMF methods
6. V and inverted V curves of a three-phase synchronous motor
7. Equivalent circuit of a single phase induction motor
8. Determination of X_d and X_q of a salient pole synchronous machine

In addition to the above eight experiments, atleast any FOUR of the following experiments are required to be conducted from the following list:

1. Parallel operation of single phase transformers
2. Separation of core losses of a single phase transformer
3. Brake test on three phase induction motor
4. Separation of no-load losses of three phase induction motor
5. Brake test on single phase induction motor
6. Regulation of three phase alternator by ZPF and ASA methods
7. Efficiency of a three phase alternator
8. Heat run test on a bank of three single phase delta connected transformers
9. Measurement of sequence impedance of a three phase alternator
10. Performance characteristics of a Schrage motor

B.Tech. III Year I Semester

10BT50212 : MEASUREMENTS AND TESTING LAB

L	T	P	C
-	-	3	2

The following experiments are required to be conducted as compulsory experiments:

1. Calibration and testing of single phase energy meter
2. Calibration of dynamometer type power factor meter
3. Crompton DC potentiometer - calibration of PMMC ammeter and PMMC voltmeter
4. Kelvin's double bridge and Wheatstone bridge - measurement of resistance - determination of tolerance
5. Measurement of % ratio error and phase angle of given CT by Silsbee's method
6. Schering bridge & Anderson bridge
7. Measurement of three phase reactive power with single phase wattmeter
8. Measurement of parameters of a choke coil using three voltmeter and three ammeter methods

In addition to the above eight experiments, at least any FOUR of the experiments from the following list are required to be conducted:

1. Measurement of earth resistance using earth meggar
2. Calibration of LPF wattmeter by Phantom loading
3. Measurement of three phase active and reactive power with two wattmeter by unbalanced load
4. Dielectric oil testing using HT testing kit
5. LVDT and capacitance pickup - characteristics and calibration
6. Resistance strain gauge - strain measurements and calibration
7. Transformer turns ratio measurement using AC bridge
8. AC Potentiometer - calibration of AC voltmeter, parameters of choke
9. Testing of reverse power relay
10. Measurement of three phase power using one wattmeter with two number of CTs

B.Tech. III Year II Semester

10BT4HS01 : MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

(Common to EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition, nature and scope of managerial economics, **demand Analysis:** Determinants of demand– demand function - law of demand and its exceptions, elasticity of demand, types, measurement and significance of elasticity of demand, demand forecasting and methods of demand forecasting.

UNIT-II : THEORY OF PRODUCTION AND COST ANALYSIS

Production Function: isoquants and isocosts, input – output relationship, law of returns, internal and external economies of scale, **Cost concepts:** opportunity Vs out lay costs, fixed Vs variable costs, explicit Vs implicit costs, out of pocket Vs inputted costs, Break Even Analysis (BEA), determination of break even point (simple problems).

UNIT-III : INTRODUCTION TO MARKETS AND PRICING

Market Structure: Types of markets, features of perfect competition, monopoly and monopolistic competition, price and output determination in perfect competition and monopoly, **Pricing:** Objectives and policies of pricing – sealed bid pricing, marginal cost pricing, cost plus pricing, going rate pricing, limit pricing, market penetration, market skimming, block pricing, bundling, peak load pricing, cross subsidization, duel pricing, administrated pricing.

UNIT-IV : BUSINESS AND NEW ECONOMIC ENVIRONMENT

Characteristic features of business, features and evolution of sole proprietorship, partnership, joint stock company, new economic policy 1991.

UNIT-V : INTRODUCTION AND PRINCIPLES OF ACCOUNTING

Accountancy: Introduction – concepts – conventions – accounting principles - double entry book keeping, journal, ledger, trail balance (simple problems).

UNIT–VI : FINAL ACCOUNTS

Introduction to final accounts, trading account, profit and loss account and balance sheet with simple adjustments (simple problems).

UNIT–VII : CAPITAL AND CAPITAL BUDGETING

Capital: Significance, types of capital, **capital budgeting:** nature and scope of capital budgeting, features and methods of capital budgeting, pay back period method, accounting rate of return method, internal rate of return method, net present value method and profitability index (simple problems).

UNIT–VIII : COMPUTERIZATION OF ACCOUNTANCY SYSTEM

Manual accounting Vs computerized accounting – advantages and disadvantages of computerized accounting – using accounting software. **Tally:**Tally features – company creation – account groups – group creation – ledger creation**.**

TEXT BOOKS:

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3rd edition, Tata McGraw-Hill, New Delhi, 2007.
2. R.Cauvery, U.K.Sudhanayak, M.Girija and R. Meenakshi, *Managerial Economics,* 1st edition, S. Chand and company, New Delhi, 1997.

REFERENCE BOOKS:

1. Ms. Samba Lalita, *Computer Accounting Lab Work*, 1st edition, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19th edition Sultan Chand and Sons, New Delhi, 2005.
3. H.Craig Petersen and W.Cris Levis, *Managerial Economics*, 4th edition, Pearson, 2009.
4. Lipsy and Chrystel, *Economics,* 4th edition,Oxford University Press, New Delhi, 2008.
5. S.N.Maheswari and S.K.Maheswari, *Financial Accounting,* 4th edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting,* 5th edition, Kalyani Publishers, Ludhiana, 2000.

B.Tech. III Year II Semester

10BT60401 : DIGITAL SIGNAL PROCESSING
(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO DIGITAL SIGNAL PROCESSING

Discrete-time signals and sequences, Linear shift invariant systems, Stability and Causality, Linear constant coefficient difference equations. Frequency domain representation of discrete-time signals and systems.

UNIT-II : DISCRETE FOURIER SERIES

DFS representation of periodic sequences, properties of Discrete Fourier Series. Discrete Fourier Transforms: properties of DFT, Linear convolution of sequences using DFT, Computation of DFT. Relation between Z-Transforms and DFS.

UNIT-III : FAST FOURIER TRANSFORMS

Fast Fourier transforms (FFT): Radix-2 Decimation in time (DIT) and Decimation in frequency (DIF), FFT algorithms, Inverse FFT and FFT for composite N.

UNIT-IV : REALIZATION OF DIGITAL FILTERS

Review of Z-transforms, Applications of Z-Transforms, Solution for difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations. Basic structures of IIR systems, Transposed forms. Basic structures of FIR systems, System function.

UNIT-V : IIR DIGITAL FILTERS

Introduction to analog and digital filters, Analog filter approximations-Butterworth and chebyshev, Design of IIR digital filters from analog filters, Design examples: analog-digital transformations.

UNIT-VI : FIR DIGITAL FILTERS

Characteristics of FIR digital filters, Frequency response. Design of FIR digital filters using windowing techniques, Frequency sampling technique, Comparison of IIR and FIR filters.

UNIT-VII : MULTIRATE DIGITAL SIGNAL PROCESSING FUNDAMENTALS

Basic sample rate alteration devices, decimation, interpolation, sampling rate conversion, implementation of sampling rate conversion, multistage design of decimator and interpolator.

UNIT-VIII : APPLICATIONS OF DIGITAL SIGNAL PROCESSING

Spectral analysis of nonstationary signals, musical sound processing, signal compression, transmultiplexers, discrete multitone transmission of digital data.

TEXT BOOKS:

1. John G. Proakis, Dimitris G. Manolakis, *Digital signal processing, principles, Algorithms and applications,* 4th Edition, Pearson Education/PHI, 2007.
2. A.V. Oppenheim and R.W. Schaffer, *Discrete Time Signal Processing,* 2nd Edition, PHI, 2006.
3. Sanjit K Mitra, *Digital signal processing, A computer base approach,* 3rd Edition, Tata Mcgraw Hill, 2009.

REFERENCE BOOKS:

1. S Salivahana, A Vallavaraj, C Gnanapriya, *Digital Signal Processing,* Tata McGraw-Hill, 2005.
2. Andreas Antoniou, *Digital signal processing,* Tata McGraw-Hill, 2006.

B.Tech. III Year II Semester

10BT50422 : LINEAR AND DIGITAL IC APPLICATIONS

L	T	P	C
4	1	-	4

UNIT-I

Differential amplifier- characteristics of OP-Amps, integrated circuits-types, classification, package types and temperature ranges, power supplies, Op-amp block diagram, ideal and practical Op-amp specifications, DC and AC characteristics, 741 op-amp & its features, FET input. Op-Amps, Op-Amp parameters and measurement, input and output Offset voltages and currents, slew rates, CMRR, PSRR, drift, frequency compensation technique.

UNIT-II : LINEAR & NON-LINEAR APPLICATIONS OF OP- AMPS

Inverting and Non-inverting amplifier, integrator and differentiator, difference amplifier, instrumentation amplifier, AC amplifier, V to I, I to V converters, buffers. Non- linear function generation, comparators, multivibrators, triangular and square wave generators, log and antilog amplifiers, precision rectifiers.

UNIT-III : TIMERS AND PHASE LOCKED LOOPS

Introduction to 555 timer, functional diagram, monostable and astable operations and applications, Schmitt trigger. PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK.

UNIT-IV : CMOS LOGIC

Introduction to logic families, CMOS logic, CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families.

UNIT-V : BIPOLAR LOGIC AND INTERFACING

Bipolar logic, transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, emitter coupled logic, comparison of logic families, familiarity with standard 74XX and CMOS 40XX series-ICs – specifications.

UNIT-VI : THE VHDL HARDWARE DESCRIPTION LANGUAGE

Design flow, program structure, types and constants, functions and procedures, libraries and packages. Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

UNIT-VI : THE VHDL HARDWARE DESCRIPTION LANGUAGE

Design flow, program structure, types and constants, functions and procedures, libraries and packages. Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

UNIT-VII : COMBINATIONAL LOGIC DESIGN

Decoders, encoders, three state devices, multiplexers and demultiplexers, code converters, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, combinational multipliers. VHDL modes for the above ICs.

UNIT-VIII : SEQUENTIAL LOGIC DESIGN

Latches and flip-flops, PLDs, counters, shift register, and their VHDL models, synchronous design methodology, impediments to synchronous design.

TEXT BOOKS:

1. Ramakanth A. Gayakwad, *Op-Amps & Linear ICs,* Prentice Hall India, 1987.
2. John F. Wakerly, *Digital Design Principles & Practices,* 3rd edition, PHI/ Pearson Education Asia, 2005.
3. Charles H. Roth Jr., *Digital System Design Using VHDL,* 1st edition, Cengage Publications.

REFERENCE BOOKS:

1. James M.Fiore, *Op amps & Linear Integrated Circuits Concepts & Applications,* Cengage 2009.
2. D. Roy Chowdhury, *Linear Integrated Circuits,* 2nd Edition, New Age International (p) Ltd, 2003.
3. J. Bhasker, *VHDL Primer*, 3rd Edition, Pearson Education/ PHI.

B.Tech. III Year II Semester

10BT60404 : MICROPROCESSORS AND MICROCONTROLLERS

(Common to EEE, ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : 8085 ARCHITECTURE

Microprocessor evolution and types, introduction to 8085 architecture, register organization, pin description, instruction set (briefly), simple programs, interrupts of 8085, interfacing I/O devices using memory mapped I/O and I/O mapped I/O.

UNIT-II : 8086 ARCHITECTURE

Architecture of 8086 microprocessor, register organization, special functions of general purpose registers, memory segmentation, pin description, minimum and maximum mode operation of 8086, timing diagram.

UNIT-III : 8086 INSTRUCTION SET AND ASSEMBLER DIRECTIVES

Machine language instruction formats, addressing modes, instruction set of 8086, assembler directives, simple programs - procedures and macros.

UNIT-IV : PROGRAMMABLE INTERFACING DEVICES

Types of data communication, serial and parallel, methods of parallel data transfer, 8255A (programmable peripheral interface) internal block diagram, operational modes and initialization, interface of I/O devices: A/D, D/A, key board, stepper motor.

UNIT-V : SERIAL DATA COMMUNICATION

Types of serial data transmission, synchronous and asynchronous, 8251 (USART), simple programs for sending and receiving characters with an 8251 (polling & interrupt basis), serial communication standard, RS232C, RS232C to TTL and TTL to RS232C conversion, USB.

UNIT-VI : INTERFACING WITH ADVANCED DEVICES

Memory (static RAM and EPROM) and I/O interfacing with 8086, 8257 (DMA controller), interrupt structure, interrupt vector table, 8259 Programmable Interrupt Controller (PIC), importance of cascading of PICs.

UNIT-VII : 8051 MICROCONTROLLER

Architecture of 8051 microcontroller, internal and external memories, addressing modes and instruction set of 8051, simple programs using 8051.

UNIT-VIII : 8051 INTERRUPTS, COMMUNICATION AND APPLICATIONS

Interrupts, timers/counters and serial communication, programming of interrupts, timers/counters and serial communication interrupts. Interfacing LEDs, seven segment display.

TEXT BOOKS:

1. Douglas V.Hall, *Microprocessors and Interfacing: Programming and Hardware,* revised 2nd edition, Tata McGraw-Hill.
2. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Sys tems*, Prentice Hall of India, 2000.

REFERENCE BOOKS:

1. Ramesh S. Goankar, *Microprocessor- Architecture, Programming and Applications with the 8085*, 5th edition, Penram International publishing private limited.
2. A.K. Ray & K.M.Bhurchandi, A*dvanced Microprocessors and Periph erals- Architecture, Programming and Interfacing,* Tata McGraw-Hill, 2002 reprint.
3. Yu-cheng Liu, Glenn A. Gibson, *Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design,* Prentice Hall of India 2006.

B.Tech. III Year II Semester

10BT60201 : UTILIZATION OF ELECTRICAL ENEGERY

L	T	P	C
4	1	-	4

UNIT-I : ELECTRIC DRIVES

Type of electric drives, choice of motor, starting and running characteristics, speed control, temperature rise, applications of electric drives, types of industrial loads, continuous, intermittent and variable loads, load equalization.

UNIT-II : ELECTRIC HEATING

Advantages and methods of electric heating, resistance heating, induction heating and dielectric heating.

UNIT-III : ELECTRIC WELDING

Electric welding, resistance and arc welding, electric welding equipment, comparison between AC and DC welding.

UNIT-IV : ILLUMINATION FUNDAMENTALS

Introduction, terms used in illumination - laws of illumination, polar curves, photometry, integrating sphere, sources of light.

UNIT-V : VARIOUS ILLUMINATION METHODS

Discharge lamps, mercury vapor and sodium vapor lamps, comparison between tungsten filament lamps and fluorescent tubes, compact fluorescent lamp, basic principles of light control, types and design of good lighting system and practice, flood lighting.

UNIT-VI : ELECTRIC TRACTION - I

System of electric traction and track electrification, review of existing electric traction systems in India, special features of traction motor, methods of electric braking, plugging, rheostatic braking, regenerative braking.

UNIT-VII : ELECTRIC TRACTION - II

Mechanics of train movement, speed-time curves for different services, trapezoidal and quadrilateral speed-time curves, calculations of tractive effort, power, specific energy consumption for given run-effect of varying acceleration and braking retardation, adhesive weight and braking retardation, coefficient of adhesion.

UNIT-VIII : ENERGY AUDITING

Cost benefit analysis, energy auditing, public supply for reduction of energy costs, bureau of energy efficiency (BEE) standards for electrical appliances, electronic chokes, smart meters, energy efficient motors: factors affecting efficiency, loss distribution, constructional details and characteristics.

TEXT BOOKS:

1. J.B.Gupta, *Utilization of Electrical Power and Electric Traction*, S.K.Kataria and Sons, 2002.
2. B.R. Gupta , *Generation of Electrical Energy*, Eurasia publishing House (P) Ltd, New Delhi, 2003.

REFERENCE BOOKS AND WEBSITES:

1. N.V.Suryanarayana, *Utilization of Electrical Power including Electric drives and Electric traction*, New Age International (P) Limited, Publishers, 1996.
2. C.L.Wadhwa, *Generation, Distribution utilization of Electrical En ergy*, New Age International Pvt .Ltd, 2003.
3. E. Openshaw Taylor, *Utilisation of Electric Energy,* Orient Longman, 1971.
4. John Andreas, *Energy - Efficient Electric Motors*, Marcel Dekker, INC, New York.
5. http://www.bee-india.nic.in
6. http://www.meteringindia.com

B.Tech. III Year II Semester

10BT60202 : POWER SEMICONDUCTOR DRIVES

L	T	P	C
4	1	-	4

UNIT-I : CONTROL OF DC MOTORS BY SINGLE PHASE CONVERTERS

Introduction to thyristor controlled drives, single phase semi and fully controlled converters connected to DC separately excited and DC series motors, continuous current operation, output voltage and current waveforms, speed and torque expressions, speed - torque characteristics - problems on converter fed DC motors.

UNIT-II : CONTROL OF DC MOTORS BY THREE PHASE CONVERTERS

Three phase semi and fully controlled converters connected to DC separately excited and DC series motors, output voltage and current waveforms, speed and torque expressions, speed - torque characteristics - problems.

UNIT-III : FOUR QUADRANT OPERATION OF DC DRIVES

Introduction to four quadrant operation, motoring operations, electric braking, plugging, dynamic and regenerative braking operations, four quadrant operation of DC motors by dual converters, closed loop operation of DC motor (block diagram only).

UNIT-IV : CONTROL OF DC MOTORS BY CHOPPERS

Single quadrant, two-quadrant and four quadrant chopper fed DC separately excited and series excited motors, continuous current operation, output voltage and current wave forms, speed-torque expressions, speed-torque characteristics, problems on chopper fed DC motors, closed loop operation (block diagram only).

UNIT-V : CONTROL OF INDUCTION MOTOR THROUGH STATOR VOLTAGE AND STATOR FREQUENCY

Variable voltage characteristics, control of induction motor by AC voltage controllers, variable frequency characteristics, variable frequency control of induction motor by voltage source and current source inverter and cycloconverters, PWM control, speed-torque characteristics, numerical problems on induction motor drives.

UNIT-VI : CONTROL OF INDUCTION MOTOR FROM ROTOR SIDE

Static rotor resistance control, slip power recovery, static Scherbius drive, static Kramer drive, their performance and speed-torque characteristics, advantages, applications - problems, closed loop operation of induction motor drives (block diagram only).

UNIT-VII : CONTROL OF SYNCHRONOUS MOTORS

Separate control and self control of synchronous motors, operation of self controlled synchronous motors by VSI and CSI cycloconverters, load commutated CSI fed synchronous motor, operation, waveforms, speed-torque characteristics, numerical problems, closed loop control operation of synchronous motor drives (block diagram only).

UNIT-VIII : CONTROL OF SPECIAL MOTOR DRIVES

Stepper motors, drive circuits for stepper motors, switched reluctance motor - operation and control requirements, converter circuits, modes of operation, solar and battery powered drives, solar panels, motors suitable for pump drives.

TEXT BOOKS:

1. G K Dubey, *Fundamentals of Electric Drives,* 2nd edition, Narosa Publications, 2009.
2. M.H. Rashid, *Power Electronic Circuits, Devices and Applications,* Prentice Hall of India.

REFERENCE BOOKS:

1. Dr. S. Sivanagaraju, M. Balasubba Reddy & A. Mallikarjuna Prasad, *Power Semiconductor Drives*, Prentice Hall of India, 2009.
2. B.K. Bose, *Modern Power Electronics and AC Drives*, Prentice Hall of India, 2006.
3. Vedam Subramanyam, *Thyristor Control of Electric Drives,* Tata McGraw-Hill Publilcations.
4. MD Singh and K B Khanchandani, *Power Electronics,* Tata McGraw-Hill Publishing Company, 1998.

B.Tech. III Year II Semester

10BT60211 : CONTROL SYSTEMS AND SIMULATION LAB

L	T	P	C
-	-	3	2

Any EIGHT of the following experiments are to be conducted from part A

PART A :

1. Time response of second order system
2. Characteristics of synchros
3. Programmable logic controller - study and verification of truth tables of logic gates, simple boolean expressions and application of speed control of motor
4. Effect of feedback on DC servo motor
5. Transfer function of DC machine
6. Effect of P, PD, PI and PID controllers on a second order systems
7. Lag and lead compensation - magnitude and phase plots
8. Temperature control using PID controller
9. Characteristics of magnetic amplifiers
10. Characteristics of AC servo motor

Any FOUR of the following experiments are to be conducted from part B

PART B:

1. PSPICE simulation of Op-amp based integrator and differentiator circuits
2. Linear system analysis (time domain analysis, error analysis) using MATLAB
3. Stability analysis (Bode, Root Locus and Nyquist) of linear time invariant system using MATLAB
4. State space model for classical transfer function using MATLAB - verification
5. Unit step response of given second order transfer function using MATLAB. Determination of peak overshoot, peak time, rise time and delay time

B.Tech. III Year II Semester

10BT60212 : POWER ELECTRONICS AND SIMULATION LAB

L	T	P	C
-	-	3	2

Any TEN experiments to be conducted from part A

PART A:

1. Characteristics of SCR, MOSFET and IGBT
2. Gate firing circuits for SCR's (R, RC triggering,Half bridge and Full bridge converter)
3. Single phase Half-wave controlled converter with R and RL loads
4. Single phase Half-controlled bridge converter with R and RL loads
5. Single phase Fully-controlled bridge converter with R and RL loads
6. Speed control of DC motor using single phase Half-controlled bridge converter
7. Speed control of DC motor using single phase Fully-controlled bridge converter
8. Single phase AC voltage controller with R and RL loads
9. Forced commutation circuits (Class A, Class B, Class C & Class D)
10. DC Jones chopper with R and RL loads
11. Single phase parallel inverter with R and RL loads
12. Single phase cycloconverter with R and RL loads
13. Single phase series inverter with R and RL loads
14. Single phase dual converter with R and RL loads
15. Single phase input IGBT based four-quadrant chopper using microprocessor

Any TWO experiments to be conducted from part B

PART B:

1. Analysis of three phase circuit using PSPICE
2. Simulation of single phase Full-converter for RLE load using PSPICE
3. Simulation of resonant pulse commutation circuit and Buck chopper using PSPICE
4. Simulation of single phase inverter with PWM control using PSPICE

B.Tech. IV Year I Semester

10BT6HS01 : MANAGEMENT SCIENCE

(Common to EEE, EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I : INTRODUCTION TO MANAGEMENT

Concepts of management and organization, nature and importance of management, evolution of management thought, functions of management, contributions of F.W. Taylor and Henri Fayol to the management, systems approach to management, managerial skills, elements of corporate planning process, environmental scanning, SWOT analysis, social responsibilities of management.

UNIT-II : DESIGNING ORGANIZATIONAL STRUCTURES

Basic concepts related to organization, departmentation and decentralization, types of organizations, merits, demerits and adoptability to modern firms.

UNIT-III : OPERATIONS MANAGEMENT

Principles and types of plant layout, methods of production, forecasting, forecasting methods, work study, basic procedure involved in method study and work measurement, statistical quality control: Factors affecting quality, quality control using control charts (simple problems), acceptance sampling.

UNIT-IV : MATERIALS MANAGEMENT

Materials management objectives, inventory, types of inventory, safety stock, classical EOQ model, need for inventory control, EOQ simple problems, ABC analysis, purchase procedure, stores management.

Marketing: Functions of marketing, marketing mix, channels of distribution.

UNIT-V : HUMAN RESOURCES MANAGEMENT (HRM)

Nature and scope of HRM, HRD and personnel management and industrial relations, functions of HRM, role of HR Manager in an organization, performance appraisal, job evaluation and merit rating, motivation, importance of motivation, maslow's theory of human needs, McGregor's theory X and theory Y, Herzberg's two factor theory.

UNIT-VI : PROJECT MANAGEMENT (PERT/CPM)

Network analysis, Program Eevaluation and Review Technique (PERT), Critical Path Method (CPM), identifying critical path, probability of completing the project within given time, project cost analysis, project crashing (simple problems).

UNIT-VII : ENTREPRENEURSHIP

Introduction to entrepreneurship, definition of an entrepreneur, entrepreneurial traits, entrepreneur vs. manager, entrepreneurial decision process, role of entrepreneurship in economic development, social responsibilities of entrepreneurs, opportunities for entrepreneurs in India and abroad, women as an entrepreneur.

UNIT-VIII : CONTEMPORARY MANAGEMENT PRACTICES

Basic concepts of Just-In-Time (JIT) system, Total Quality Management (TQM) , value chain analysis, Enterprise Resource Planning (ERP), Business Process Outsourcing (BPO), gobalization, management challenges, intellectual property rights, supply chain management, role of information technology in managerial decision making.

TEXT BOOKS:

1. O.P. Khanna, *Industrial Engineering and Management*, Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management*, 6th Edition, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement*, 12th Edition, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6th edition, Tata McGraw-Hill, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2nd edition, Tata McGraw-Hill, New Delhi.
4. Heinz Weihrich and Harold Koontz, *Management- A Global Perspective*,10th Edition, McGraw-Hill International.

B.Tech. IV Year I Semester

10BT70201 : SWITCHGEAR AND PROTECTION

L	T	P	C
4	-	-	4

UNIT-I : SHORT CIRCUIT ANALYSIS

Symmetrical fault analysis: short circuit current and MVA calculations, fault levels - problems, Unsymmetrical fault analysis: LG, LL and LLG faults with and without fault impedance - problems.

UNIT-II : FUSES AND CIRCUIT BREAKERS

Fuses-types, ratings, isolators, circuit breakers: elementary principles of arc interruption, recovery, restriking voltage, restriking phenomenon average and maximum rate of rise of restriking voltage, current chopping and resistance switching, construction and principle of minimum oil circuit breaker, air blast circuit breaker, vacuum circuit breaker and SF_6 circuit breaker, circuit breaker ratings and specifications, auto reclosures.

UNIT-III : ELECTROMAGNETIC RELAYS

Basic requirements of relays, types of relays based on applications, constructional details of attracted armature, balanced beam, induction type relays, differential relays and biased differential relays, universal torque equation, characteristics of over current, directional and distance relays (R-X diagram).

UNIT-IV : STATIC AND MICROPROCESSOR BASED RELAYS

Static relays, advantages and disadvantages, basic requirements of static relays,definite time, inverse and IDMT static relays, comparators, amplitude and phase comparators, microprocessor based relays, advantages and disadvantages, block diagram for over current (definite, inverse and IDMT) and distance relays and their flow charts.

UNIT-V : PROTECTION OF GENERATORS AND TRANSFORMERS

Protection of generators: differential protection, restricted earth fault protection and inter-turn fault protection, rotor fault protection, problems on percentage winding unprotected.

Transformer protection: differential protection, percentage differential protection, Buchholtz relay protection, problems on design of CT's ratio.

UNIT-VI : PROTECTION OF FEEDERS AND TRANSMISSION LINES

Protection of feeder (radial and ring main) using over current relays, protection of transmission line, 3-Zone protection using distance relays, carrier current protection, protection of bus bars.

UNIT-VII : NEUTRAL GROUNDING

Grounded and ungrounded systems, effects of ungrounded neutral on system performance, methods of neutral grounding, solid, resistance, reactance and peterson coil grounding, arcing grounds and grounding practices, applications of reactors - problems.

UNIT-VIII : PROTECTION AGAINST OVER VOLTAGES

Generation of over voltages in power systems, protection against lightning over voltages, valve type and Zinc-Oxide lighting arresters, insulation co-ordination, basic impulse level.

TEXT BOOKS:

1. Sunil S Rao, *Switchgear and Protection,* 11th edition, Khanna Publishers, 2005.
2. Badri Ram, D.N.Viswakarma, *Power System Protection and Switchgear,* 18th reprint, Tata McGraw-Hill Publications, 2005.

REFERENCE BOOKS:

1. C.L.Wadhwa, *Electrical Power Systems,* 3rd edition, New Age International (P) Limited, Publishers, 2005.
2. B.L.Soni, Gupta, Bhatnagar, Chakrabarthy, *A Text Book on Power System Engineering,* Dhanpat Rai & Co, 2007.
3. B.Ravindranath, M.Chander, *Power System Protection and Switchgear,* 1st edition, New Age International (P) Limited, Publishers, 2007.
4. T.S.Madhava Rao, *Power System Protection: Static Relays,* 2nd edition, Tata McGraw-Hill inc., US 2004.

B.Tech. IV Year I Semester

10BT70202 : POWER SYSTEM OPERATION AND CONTROL

L	T	P	C
4	1	-	4

UNIT-I : ECONOMIC OPERATION OF POWER SYSTEMS-I

Optimal operation of generators in thermal power stations, characteristics of thermal plants - heat rate curve, incremental fuel and production costs, input-output characteristics, optimum allocation with line losses neglected.

UNIT-II : ECONOMIC OPERATION OF POWER SYSTEMS-II

Optimum generation allocation including the effect of transmission losses-loss coefficients, general transmission line loss formula.

UNIT-III : HYDROTHERMAL SCHEDULING

Optimal scheduling of hydrothermal system: hydroelectric power plant models, scheduling problems, short term hydrothermal scheduling problem.

UNIT-IV : MODELING OF TURBINE,GENERATOR AND GOVERNOR

Modeling of turbine: first order turbine model, block diagram representation of steam turbines and approximate linear models, modeling of generator(steady state and transient models): description of simplified network model of a synchronous machine (classical model), description of swing equation (no derivation) and state space II-order mathematical model of synchronous machine,
Modeling of governor: Mathematical modeling of speed governing system, derivation of small signal transfer function, block diagram.

UNIT-V : SINGLE AREA LOAD FREQUENCY CONTROL

Necessity of keeping frequency constant, definition of control area, block diagram representation of an isolated power system, steady state response (controlled and uncontrolled case), dynamic response(uncontrolled case), Proportional plus integral control of single area and its block diagram representation of single area system, steady state response-load frequency control and economic dispatch control.

UNIT-VI : TWO AREA LOAD FREQUENCY CONTROL

Load frequency control of two area system, uncontrolled and controlled case, tie-line bias control.

UNIT-VII : REACTIVE POWER-VOLTAGE CONTROL

Overview of reactive power control, typical excitation scheme, generation and absorption of reactive power, relation between voltage and reactive power, methods of voltage control in transmission system, advantages and disadvantages of different types of compensating equipment for transmission systems.

UNIT-VIII : POWER SYSTEM RESTRUCTURING

Introduction, need for deregulation, motivation for power system restructuring, key issues in deregulation.

TEXT BOOKS

1. C.L.Wadhwa, *Electrical Power Systems*, 3rd edition, New Age International, 2005.
2. I.J. Nagrath & D.P. Kothari, *Modern Power System Analysis*, 3rd edition, Tata McGraw-Hill, 2003.

REFERENCE BOOKS:

1. S.N. Singh, *Electric Power Generation, Transmission and Distribu tion*, 2nd edition, Prentice Hall India.
2. A. Chakravarthi and S. Halder, *Power System Analysis Operation and Control,* 3rd edition, Prentice Hall India.
3. Hadi Saadat, *Power System Analysis*, Tata McGraw-Hill edition, 2004.

B.Tech. IV Year I Semester

10BT70203 : POWER SYSTEM ANALYSIS

L	T	P	C
4	1	-	4

UNIT-I : POWER SYSTEM NETWORK MATRICES-I

Representation of power system elements, essential characteristics of a good algorithm, steps involved in solving a problem using digital computer, Graph Theory: definitions, bus incidence matrix, Y_{Bus} formation by direct and singular transformation methods - problems.

UNIT-II : POWER SYSTEM NETWORK MATRICES-II

Formation of Z_{Bus}: partial network, algorithm for the modification of Z_{Bus} matrix for addition element for the following cases: addition of element from a new bus to reference, addition of element from a new bus to an old bus, addition of element between an old bus to reference and addition of element between two old busses (derivations and numerical problems), modification of Z_{Bus} for the changes in network.

UNIT-III : POWER FLOW STUDIES-I

Necessity of power flow studies, data for power flow studies - derivation of static load flow equations - load flow solutions using Gauss Seidel method: acceleration factor, load flow solution with and without PV buses, algorithm and flowchart, numerical load flow solution for simple power systems (max. 3-Buses): determination of bus voltages, injected active and reactive powers (sample one iteration only) and finding line flows/losses for the given bus voltages.

UNIT-IV : POWER FLOW STUDIES-II

Newton Raphson method in rectangular and polar co-ordinates form: load flow solution with or without PV buses, derivation of Jacobian elements, algorithm and flowchart, decoupled and fast decoupled methods, comparison of different methods, DC load flow.

UNIT-V : THREE PHASE NETWORK MODEL

Three phase elements, rotating, stationary elements, three phase balanced network elements, symmetrical components transformation matrices, three phase unbalanced network elements.

UNIT-VI : FAULT ANALYSIS USING Z_{BUS}

Symmetrical and unsymmetrical fault analysis using Z_{Bus} and problems.

UNIT-VII : POWER SYSTEM STEADY STATE STABILITY ANALYSIS

Elementary concepts of steady state, dynamic and transient stabilities, description of steady state stability power limit, transfer reactance, synchronizing power coefficient, power angle curve and determination of steady state stability and methods to improve steady state stability.

UNIT-VIII : POWER SYSTEM TRANSIENT STATE STABILITY ANALYSIS

Derivation of swing equation, determination of transient stability by equal area criterion, application of equal area criterion, critical clearing angle calculation, solution of swing equation by point by point method, methods to improve transient stability, application of auto reclosing and fast operating circuit breakers.

TEXT BOOKS:

1. Stagg El - Abiad & Stags, *Computer Methods in Power Systems*, McGraw-Hill edition.
2. I.J.Nagrath & D.P.Kothari, *Modern Power system Analysis*, 2nd edition, Tata McGraw-Hill Publishing Company.
3. B.R. Gupta,*Power System Analysis and Design*, 6th revised edition, S.Chand & Co, 2010.

REFERENCE BOOKS:

1. Grainger and Stevenson, *Power System Analysis*, Tata McGraw-Hill, 2003.
2. M.A. Pai, *Computer Techniques in Power System Analysis*, 2nd edition, Tata McGraw-Hill, 1994.
3. S. Sivanagaraju, B. V. Rami Reddy, *Electrical Power System Analysis*, revised edition, Laxmi Publications, 2011.
4. Glovar and Sarma, *Power System Analysis*, Thomson Publishers, 2008.
5. Hadi Saadath, *Power System Analysis*, Tata McGraw-Hill, 2004.

B.Tech. IV Year I Semester

10BT71302 : PROGRAMMABLE LOGIC CONTROLLERS

(ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I : PLC BASICS

Introduction, PLC advantages, disadvantages, PLC system, CPU, I/O modules and interfacing, power supplies, Programming equipment, Programming formats, Construction of PLC ladder diagrams, Devices connected to I/O modules.

UNIT-II : PLC PROGRAMMING

Input instructions, Outputs, Operational procedures, Programming examples using contacts and coils, Fail-Safe Circuits, Drill press operation.

UNIT-III : DIGITAL LOGIC GATES AND LADDER DIAGRAMS

Digital logic gates, Boolean algebra PLC programming, Conversion examples.

Ladder Diagrams for process control: Ladder diagrams & sequence listings, ladder diagram construction and flowchart for spray process system.

UNIT-IV : REGISTERS AND TIMER FUNCTIONS

Characteristics of Registers, module addressing, holding registers, Input Registers, Output Registers. Timer function & Industrial applications, Counter function & industrial applications.

UNIT-V : INTERMEDIATE FUNCTIONS

Intermediate functions: Arithmetic functions, Number comparison functions, Number conversion functions

UNIT-VI : DATA HANDLING FUNCTIONS

Skip, Master control relay, Jump functions. PLC data move systems: Move function, FIFO, FAL, ONS, CLR & Sweep functions and their applications

UNIT-VII : PLC FUNCTIONS WORKING WITH BITS

Bit Pattern, Changing a register bit status, Shift register functions and applications, Sequencer functions and applications, Controlling of two-axis & three axis Robots with PLC, Matrix functions.

UNIT-VIII : ADVANCED PLC FUNCTIONS

Analog modules & systems, Analog signal processing, Multi-bit Data Processing, Analog output application examples, PID principle, position indicator with PID control, PID Modules, PID tuning, PID functions, Networking of PLCs, Alternative Programming languages, PLC auxiliary commands and functions.

TEXT BOOK:

1. John W. Webb & Ronald A. Reiss, *Programmable Logic Controllers Principles and Applications,* Fifth Edition, PHI.

REFERENCE BOOK:

1. M.Chidambaram, *Computer control of process*, Narosa 2003.

B.Tech. IV Year I Semester

10BT50423 : PRINCIPLES OF COMMUNICATION

(ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION

Block diagram of electrical communication system, radio communication: Types of communications, analog, pulse and digital types of signals, fourier transform for various signals, fourier spectrum, power spectral density, autocorrelation, cross correlation, convolution.

UNIT-II : AMPLITUDE MODULATION

Need for modulation, types of amplitude modulation, AM, DSBSC, SSBSC, power and BW requirements, generation of AM, DSBSC, SSBSC, demodulation of AM: Diode detector, product demodulation for DSBSC & SSBSC.

UNIT-III : ANGLE MODULATION

Frequency and phase modulations, advantages of FM over AM, bandwidth consideration, narrowband and wideband FM, generation and demodulation of FM, comparison of FM and PM.

UNIT-IV : PULSE MODULATIONS

Sampling, nyquist rate of sampling, sampling theorem for band limited signals, PAM, regeneration of base band signal, PWM and PPM, time division multiplexing, frequency division multiplexing, asynchronous multiplexing.

UNIT-V : PCM SCHEMES

Advantages, block diagram of PCM, quantization, effect of quantization, quantization error, base band digital signal, DM, ADM, ADPCM and comparison.

UNIT-VI : DIGITAL MODULATION

ASK, FSK, PSK, QPSK, DPSK, QAM, modulation and demodulation-coherent and incoherent, modems.

UNIT-VII : INFORMATION THEORY

Concept of information, rate of information and entropy, source coding for optimum rate of information, coding efficiency, Shanon-Fano and huffman coding.

UNIT-VIII : ERROR CONTROL CODING

ntroduction, error detection and correction codes, block codes, convolutional codes.

TEXT BOOKS:

1. Simon Haykin, *Communication Systems,* 2nd edition, John Wiley Publishers, 2008.
2. R.P. Singh and S D Sapre, *Communication Systems Analog and Digital,* 3rd edition, Tata McGraw-Hill, 2006.
3. H. Taub and D. Schilling, *Principles of Communication Systems,* 2nd edition, Tata McGraw-Hill, 2003.

REFERENCE BOOKS:

1. Kennedy and Davis, *Electronic Communication Systems,* 4th edition, Tata McGraw-Hill, 2004.
2. John. G. Proakis and Masoud Salehi, *Communication Systems Engineering,* 2nd edition, Prentice Hall India, 2004.

B.Tech. IV Year I Semester

10BT60405 : VLSI DESIGN

(ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION

Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT-II : BASIC ELECTRICAL PROPERTIES

Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT-III : VLSI CIRCUIT DESIGN PROCESSES

VLSI design flow, MOS layers, Stick diagrams, Design rules and Layout, 2 μ m CMOS design rules for Wires, Contacts and Transistors, Layout diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

UNIT-IV : GATE LEVEL DESIGN

Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations - Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT-V : SUBSYSTEM DESIGN

Adders – Transmission based Adder, Carry Bypass Adder, Carry Skip Adder, Carry Select Adder, Shifters- Barrel Shifter, Logarithmic Shifter, Multipliers – Definitions, Array Multiplier, Carry Save multiplier, Booth Multiplier, ALUs, Parity generators, Comparators, Zero/One Detectors, Counters- Synchronous & Asynchronous Counter, High Density Memory Elements.

UNIT-VI : SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN

PLAs, FPGAs, CPLDs, PALs, Cell based Design Methodology, Design Approach.

UNIT-VII : VHDL SYNTHESIS

VHDL synthesis, circuit design flow, circuit synthesis, types of simulation, layout synthesis, design capture tools, design verification tools.

UNIT-VIII : CMOS TESTING

CMOS testing, need for testing, test principles, design strategies for test, chip level test techniques, system-level test techniques, layout design for improved testability.

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, *Essentials of VLSI Circuits and Systems,* Prentice Hall India, 2005 edition.
2. Weste and EShraghian, *Principles of CMOS VLSI Design,* Pearson Education, 1999.

REFERENCE BOOKS:

1. John M. Rabaey, *Digital Integrated Circuits: A Design Perspective,* 2nd edition, Prentice Hall India, EEE, 1997.
2. Wayne wolf, *Modern VLSI Design,* 3rd edition, Pearson Education, 1997.
3. Charles H. Roth, *Fundamentals of Logic Design,* 5th edition, Thomson Publications, 2004.

B.Tech. IV Year I Semester

10BT70421 : ADVANCED MICROPROCESSOR AND MICRO CONTROLLERS

(ELECTIVE - I)

L	T	P	C
4	1	-	4

UNIT-I : THE 80286 MICROPROCESSORS

Architecture, Register Organization, Addressing Modes and over view on instruction set of 80286.

UNIT-II : THE 80386 AND 80486 MICROPROCESSORS

Architectural features, Register Organization, Memory management, Virtual 8086 mode, The Memory Paging Mechanism.

UNIT-III : THE PENTIUM AND PENTIUMPRO PROCESSORS

The Memory System, Input/output system, Branch Prediction Logic, Cache Structure, Pentium Registers, Serial Pentium pro features.

UNIT-IV : THE PENTIUM IV AND DUALCORE MICROPROCESSORS

Architecture, Special Registers and Pin Structures (brief treatment only)

UNIT-V : OVERVIEW OF ARCHITECTURE AND MICROCONTROLLER RESOURCES

Architecture of a typical micro controller – Microcontroller resources – Resources in advanced and next generation microcontrollers. 8051 microcontroller – Internal and External memories – Counters and Timers – Synchronous serial-cum asynchronous serial communication - Interrupts.

UNIT-VI : 8051 FAMILY MICROCONTROLLERS INSTRUCTION SET

Basic assembly language programming – Data transfer instructions – Data and Bit-manipulation instructions – Arithmetic instructions – Instructions for Logical operations on the test among the Registers, Internal RAM, and SFRs– Program flow control instructions – Interrupt control flow.

UNIT-VII : REAL TIME CONTROL

INTERRUPTS: Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-mask able interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051.

TIMERS: Programmable Timers in the MCU's – Free running counter and real time control – Interrupt interval and density constraints.

UNIT-VIII : 16/32 BIT MICROCONTROLLERS

16 bit Microcontrollers: Hardware – Memory map in Intel 80196 family MCU system – IO ports – Programmable Timers and High-speed outputs and input captures – Interrupts

ARM 32 Bit Microcontrollers: Introduction to 16/32 Bit processors – ARM architecture and organization – ARM / Thumb programming model – ARM / Thumb instruction set

TEXT BOOKS:

1. Barry B. Brey, *The Intel Microprocessors,* 8th edition, Pearson Education, 2009.
2. A.K.Ray and K.M.Bhurchandi, *Advanced Microprocessor and Peripherals,* Tata McGraw-Hill, 2000.
3. Raj Kamal, *Microcontrollers Architecture, Programming, Interfacing and System Design,* Pearson Education, 2005.
4. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems,* Prentice Hall India, 2000.

REFERENCE BOOKS:

1. YU-Chang, Glenn A. Gibson, *Micro Computer Systems: The 8086/8088 Family Architecture, Programming and Design,* 2nd edition, Pearson Education, 2007.
2. Douglas V. Hall, *Microprocessors and Interfacing,* Special Indian Edition, 2006.
3. A.V. Deshmuk, *Microcontrollers (Theory & Applications),* WTMH, 2005.
4. John B. Peatman, *Design with PIC Microcontrollers,* Pearson Education, 2005.

B.Tech. IV Year I Semester

10BT51301 : ADVANCED CONTROL SYSTEMS (ELECTIVE-II)

L	T	P	C
4	1	-	4

UNIT-I : STATE SPACE ANALYSIS

State Space Representation using phase variables, Solution of State Equation, State Transition Matrix, Diagonalization, Canonical Forms, Controllable Canonical Form, Observable Canonical Form, Jordan Canonical Form.

UNIT-II : CONTROLLABILITY AND OBSERVABILITY

Tests for controllability and observability for continuous time systems, Necessary and sufficient conditions for controllability and observability, Principle of Duality, Controllability and observability form Jordan canonical form and other canonical forms.

UNIT-III : DESCRIBING FUNCTION ANALYSIS

Introduction to nonlinear systems, Different physical nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT-IV : PHASE-PLANE ANALYSIS

Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase-plane analysis of nonlinear control systems, Delta method.

UNIT-V : STABILITY ANALYSIS

Stability in the sense of Lyapunov, Lyapunov's stability and Lypanov's instability theorems, Graphical representation, Sylvester principle, Definiteness, Direct method of Lypanov for the Linear and Nonlinear continuous time autonomous systems.

UNIT-VI : MODAL CONTROL

Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.

UNIT-VII : OPTIMAL CONTROL

Formulation of optimal control problem. Minimum time, Minimum energy, minimum fuel problems, State regulator problem, Output regulator problem, Tracking problem, Continuous-Time Linear Regulators**.**

UNIT-VIII : CALCULUS OF VARIATIONS

Minimization of functionals of single function, Euler Lagrange Equation, Constrained minimization, Minimum principle, Control variable inequality constraints, Control and state variable inequality constraints.

TEXT BOOKS:

1. M. Gopal, *Modern Control System Theory*, 2nd edition, New Age International Publishers, 1996.
2. A.Nagoor kani, *Advanced control Theory*, 2nd Edition, RBA Publications, 2009.

REFERENCE BOOKS:

1. K. Ogata, *Modern Control Engineering*, 3rd edition, Prentice Hall of India, 1998.
2. I.J. Nagarath and M.Gopal, *Control Systems Engineering,* New Age International (P) Ltd.
3. A. Ananda Kumar, *Control Systems,* PHI, 2007.

B.Tech. IV Year I Semester

10BT70204 : FLEXIBLE AC TRANSMISSION

(ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO TRANSMISSION NETWORKS

Electrical transmission networks, conventional control methods, Automatic Generation Control(AGC), excitation control, transformer tap changer control, phase shifting transformer, problems of AC transmission systems, power flow in parallel paths and meshed system, factors limiting loading capability, stability consideration.

UNIT-II : REACTIVE POWER CONTROL

Reactive power control in electrical power transmission - principles of conventional reactive power compensators, Flexible AC Transmission Systems (FACTS) concepts, importance of controllable parameters, basic types of FACTS controllers, advantages of FACTS technology.

UNIT-III : VOLTAGE AND CURRENT SOURCE CONVERTERS

Voltage source converters: conversion principles, transformer connections for 3, 6, 12, 24 and 48 pulse operation, pulse width modulation converter, current source converters.

UNIT-IV : STATIC SHUNT COMPENSATORS

Static shunt compensation: objectives of shunt compensation, mid point voltage regulation, voltage instability prevention, improvement of transient stability, power oscillation damping.

UNIT-V : STATIC VAR COMPENSATORS

Methods of controllable VAR generation, variable impedance type static VAR generators, switching converter type VAR generators, hybrid VAR generators.

UNIT-VI : SVC AND STATCOM APPLICATIONS

Voltage control by SVC, influence of SVC on system voltage, design of SVC voltage regulator, modeling of SVC for power flow and transient stability, principle of operation of STATCOM, V-I characteristics.

Applications: enhancement of transient stability, steady state power transfer, prevention of voltage instability.

UNIT-VII : STATIC SERIES COMPENSATOR

Static series compensators: concept of series capacitive compensation, improvement of transient stability, power oscillation damping.

UNIT-VIII : TCSC APPLICATIONS

Operation of TCSC, different modes of operation, modeling of TCSC - variable reactance model, modeling of power flow and stability studies.

Applications: improvement of system stability limit, enhancement of system damping.

TEXT BOOKS:

1. Narain G.Hingorani, Laszi Gyugyi, *Understanding FACTS: Concepts and Technology of Flexible AC Transmission Systems*, Wiley-IEEE Press, 1999.
2. R.Mohan Mathur and Rajiv K.Varma, *Thyristor Based FACTS Controllers for Electrical Transmission Systems*, Wiley-IEEE Press, 2002.

REFERENCE BOOKS:

1. Xiao-Ping, Rehtanz, Christian, Pal, Bikash, *Flexible AC Transmission Systems: Modeling and Control , Springer Power Systems Series*, 2006.
2. P. S. Kundur, *Power System Stability and Control,* McGraw-Hill Professional, 1994.
3. R. Padiyar, *Power System Dynamics: Stability and Contro*l, John Wiley, 1996.

B.Tech. IV Year I Semester

10BT70205 : HIGH VOLTAGE DC TRANSIMISSION

(ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO HVDC TRANSMISSION

HVDC transmission: need for HVDC transmission, apparatus required for HVDC transmission system, types of DC links, comparison of AC and DC transmission systems, applications of AC and DC transmission systems, planning and modern trends in HVDC transmission system.

UNIT-II : STATIC POWER CONVERTER ANALYSIS

Static power converters: analysis of Graetz circuit, characteristics of 6 pulse & 12 pulse converters, communication process, rectifier and inverter operation, equivalent circuit for converter, special features of converter transformers.

UNIT-III : HARMONICS

Generation of harmonics, characteristic harmonics, calculation of AC harmonics, non-characteristic harmonics, effects of harmonics, calculation of voltage and current harmonics, effect of pulse number on harmonics.

UNIT-IV : FILTERS

Types of AC filters, filter characterstics, design of single tuned filters, design of high pass filters, DC filters.

UNIT-V : CONTROL OF HVDC CONVERTER AND SYSTEMS

Principle of DC link control, constant current, constant extinction angle and constant ignition angle control, individual phase control and equidistant firing angle control.

UNIT-VI : REACTIVE POWER CONTROL IN HVDC

Reactive power requirements in steady state, conventional control strategies, alternate control strategies, sources of reactive power, AC filters, shunt capacitors, synchronous condensers, static VAR systems.

UNIT-VII : POWER FLOW ANALYSIS IN AC/DC SYSTEMS

Modeling of DC links, DC networks, DC power flow control, pu system for DC quantities, solution of AC-DC power flow, simultaneous method, sequential method.

UNIT-VIII : CONVERTER FAULTS AND PROTECTION

Converter faults, over voltages in converter station, protection against over current and over voltage in converter station, surge arresters, protection of DC line, DC breakers.

TEXT BOOKS:

1. K.R.Padiyar, *High Voltage Direct Current Transmission,* New Age International (P) Ltd., New Delhi.
2. Sunil S Rao, EHVAC, *HVDC Transmission and Distribution Engi neering*, Khanna Publishers, 2001.

REFERENCE BOOKS:

1. E.Uhlman, *Power Transmission by Direct Current,* Springer Verlag, Berrlin.
2. J. Arillaga, *H.V.D.C.Tranmission*, Peter Peregrilnus Ltd., London, UK, 1983.
3. E. W. Kimbark, *Direct current Transmission,* John Wiely & Sons, New York.

B.Tech. IV Year I Semester

10BT70206 : RENEWABLE ENERGY SOURCES

(ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I : PRINCIPLES OF SOLAR RADIATION

Role and potential of new and renewable source, the solar energy option, environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data.

UNIT-II : SOLAR ENERGY COLLECTION

Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

UNIT-III : SOLAR ENERGY STORAGE AND APPLICATIONS

Different methods, sensible, latent heat and stratified storage, solar ponds, solar applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

UNIT-IV : WIND ENERGY

Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria.

UNIT-V : BIO-MASS

Principles of bio-conversion, anaerobic/aerobic digestion, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, IC engine operation and economic aspects.

UNIT-VI : GEOTHERMAL ENERGY

Resources, types of wells, methods of harnessing the energy, potential in India.

UNIT-VII : OCEAN ENERGY

OTEC: principle of utilization, setting of OTEC plants, thermodynamic cycles, tidal and wave energy: potential and conversion techniques, mini-hydel power plants and their economics.

UNIT-VIII : DIRECT ENERGY CONVERSION

Need for DEC, Carnot cycle, limitations, principles of DEC, thermo-electric generators, Seebeck, Peltier, Joul and Thomson effects, MHD generators - principle, fuel cells - principle, Faraday's laws, thermo-dynamic aspects, selection of fuel and operation conditions.

TEXT BOOKS:

1. G.D. Rai, *Non-Conventional Energy Sources*, Khanna Publishers, Delhi, 2007.
2. G.N. Tiwari and M.K. Ghosal, *Fundamentals of Renewable Energy Resources,* Narosa Publishing House, New Delhi, 2007.

REFERENCE BOOKS:

1. Twidell & Wier, *Renewable Energy Resources*, CRC Press(Taylor & Francis), 2006.
2. Ramesh & Kumar, *Renewable Energy Technologies*, Narosa Publishing House, New Delhi, 2003
3. K Mittal, *Non-Conventional Energy Systems*, Wheeler Publishing, New Delhi, 2003.
4. D.P. Kothari,K.C.Singhal, *Renewable Energy Sources and Emerg ing Technologies,* Prentice Hall Iindia.
5. G.D. Rai, *Solar Energy Utilization*, Khanna Publishers, Delhi, 2001.

B.Tech. IV Year I Semester

10BT60411 : MICROPROCESSORS AND MICROCONTROLLERS LAB

L	T	P	C
-	-	3	2

Any TWELVE experiments to be conducted

I Programs using 8085

1. Arithmetic operations
2. Logical operations

II Programs using 8086

1. Introduction to MASM/TASM
2. Arithmetic operations
3. Logic operations
4. String operations
5. Modular program: use procedure

III Interfacing Programs with 8086

1. Stepper motor
2. Logic controllers
3. A/D and D/A converter
4. Seven segment display
5. Keyboard interfacing

IV Programs using 8051

1. Arithmetic operations
2. Addition operation using external memory
3. Programs using special instructions like SWAP, bit/byte, set/reset etc.

B.Tech. IV Year I Semester

10BT70211 : POWER SYSTEMS AND SMULATION LAB

L	T	P	C
-	-	3	2

The following experiments are required to be conducted as compulsory experiments

PART A: POWER SYSTEMS EXPERIMENTS

1. Determination of sub-transient reactance of salient pole synchronous machine
2. Determination of sequence impedances of cylindrical rotor synchronous machine
3. LG & LL fault analysis of synchronous generator
4. Power angle characteristics of salient pole synchronous machine
5. Determination of sequence components of salient pole synchro nous Machine
6. Characteristics of over current relay

PART B: SIMULATION EXPERIMENTS

1. Formation of Y_{BUS} using MATLAB programme
2. Formation of Z_{BUS} using MATLAB programme
3. Gauss-Seidel method load flow analysis using MATLAB programme
4. Newton-Raphson method load flow analysis using MATLAB programme
5. Development of MATLAB simulink model for a synchronous machine with and without AVR
6. Development of MATLAB Simulink model for a single area and two area load frequency problem

B.Tech. IV Year I Semester

10BT7HS01 : PROFESSIONAL ETHICS

(Audit Course)

Common to ECE, EEE, EIE & EConE

L	T	P	C
2	-	-	-

UNIT-I : ENGINEERING ETHICS

Scope and aims of engineering ethics-Senses of Engineering Ethics-Variety of Moral Issues-Types of Inquiry- Moral Dilemmas,- Moral Autonomy- Kohlberg's Theory, Gilligan's theory, Consensus and Controversy.

UNIT-II : PROFESSIONAL IDEALS AND VIRTUES

Theories about virtues, professional responsibility, integrity, self-respect, sense of "responsibility". Self-Interest, Customs and Religion- Self-interest and ethical egoism, customs and ethical relativism, religion and divine command ethics. Use of ethical theories- resolving moral dilemmas and Moral leadership

UNIT-III : ENGINEERING AS SOCIAL EXPERIMENTATION

Engineering as experimentation- similarities to standard experiments, learning from the past and knowledge gained. Engineering as Responsible experiments-Conscientiousness. Moral autonomy and accountability, the challenger case.

UNIT-IV : RESPONSIBILITIES AND RIGHTS

Collegiality and Loyalty, Respect for authority, collective bargaining, confidentiality, conflict of interests, occupational crime. Rights of Engineers- Professional rights, whistle-blowing, The bart case, employee rights and discrimination.

UNIT-V : GLOBAL ISSUES

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Managers, Consultants and Leaders. Engineers as managers - Managerial ethics applied to engineering profession.

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, *Ethics in Engineering,* Tata McGraw-Hill, 3rd Edition, 1996, 14th Reprint, 2007.
2. Govindarajan M, Nata Govindarajan. M, Natarajan. S, Senthilkumar. V.S, *Engineering Ethics*, Prentice Hall of India, 2004.

REFERENCE BOOKS:

1. Dr. S. Kannan, K. Srilakshmi, *Human Values and Professional Ethics*, Taxmann Allied Services pvt ltd., 2009.
2. Edmund G seebauer and Robert L Barry, *Fundamental of Ethics for scientists and Engineers*, Oxford University Press, Oxford, 2001.
3. Charles F Fledderman, *Engineering Ethics*, Pearson education/ Prentice Hall, NewJercy, 2004, (Indian reprint).

B.Tech. IV Year II Semester

10BT70405 : EMBEDDED AND REAL TIME SYSTEMS

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION

Embedded systems overview, classification, applications, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

UNIT-II : GENERAL PURPOSE PROCESSORS

Basic architecture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Microcontrollers and Digital Signal Processors.

UNIT-III : STATE MACHINE AND CONCURRENT PROCESS MODELS

Introduction, models versus languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT-IV : COMMUNICATION INTERFACE

Need for communication interfaces, RS232 / UART, RS422 / RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, I^2C bus and CAN

UNIT-V : EMBEDDED/RTOS CONCEPTS–I

Architecture of the Kernel, Tasks and Task scheduler, Types of real-time tasks, Task periodicity, Task scheduling, Classification of scheduling algorithms, Clock driven Scheduling, Event driven Scheduling, resource sharing, Commercial RTOs.

UNIT-VI : EMBEDDED/RTOS CONCEPTS–II

Interrupt service routines, Semaphores, Mutex, Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority inversion problem.

UNIT-VII : TARGET ARCHITECUTERS

Host and target machines, linkers, loading software into target machine, debugging techniques, ARM microcontroller, ARM pipeline, Instruction set architecture, THUMB instructions, Exceptions in ARM, salient features of SHARC microcontroller and comparison with ARM microcontroller.

UNIT-VIII : DESIGN TECHNOLOGY

Introduction, Automation, Synthesis, Parallel evolution of compilation and synthesis, Logic Synthesis, RT synthesis, Behavioral Synthesis, Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation, Reuse of intellectual property codes.

TEXT BOOKS:

1. Frank Vahid, Tony D. Givargis, *Embedded System Design – A Unified Hardware/Software Introduction,* John Wiley, 2002.
2. KVKK Prasad, *Embedded/Real Time Systems,* Dreamtech Press, 2005.
3. Santanu Chattopadyay, *Embedded System Design,* Prentice Hall India, 2010.

REFERENCE BOOKS:

1. Jonathan W. Valvano, Brooks/Cole, *Embedded Microcomputer Systems,* Thompson Learning, 2002.
2. David E. Simon, *An Embedded Software Primer,* Pearson Education, 2005.
3. Sri Ram VIyer, Pankaj Gupta, *Embedded Real Time Systems Programming,* Tata McGraw-Hill, 2004.

B.Tech.IV Year II Semester

10BT50503 : DATA BASE MANAGEMENT SYSTEMS

(ELECTIVE-III)

L	T	P	C
4	1	-	4

UNIT–I : INTRODUCTION

History of Database Systems, Introduction to DBMS, Database System Applications, Database Systems Versus File Systems, View of Data, Data Models, Database Languages- DDL & DML Commands and Examples of Basic SQL Queries, Database Users and Administrators, Transaction Management, Database System Structure, Application Architectures.

UNIT–II : DATABASE DESIGN

Introduction to Database Design, E-R Diagrams, Entities, Attributes and Entity Sets, Relationships and Relationship Sets, Additional Features of the E-R Model, Conceptual Design with the E-R Model, Conceptual Design for Large Enterprises, ERD Case Studies.

UNIT–III : RELATIONAL MODEL

Introduction to the Relational Model, Integrity Constraints over relations, Enforcing Integrity Constraints, Querying Relational Data, Logical Database Design: ER to Relational, Introduction to Views, Destroying/Altering Tables and Views.

Relational Algebra and Calculus: Preliminaries, Relational Algebra Operators, Relational Calculus - Tuple and Domain Relational Calculus, Expressive Power of Algebra and Calculus.

UNIT–IV : SQL QUERIES, CONSTRAINTS AND TRIGGERS

Overview, The form of a Basic SQL Query, Union, Intersect and Except operators, Nested Queries, Aggregate Operators, Null values, Complex Integrity Constraints in SQL, Triggers and Active Databases, Designing Active Databases.

UNIT–V : SCHEMA REFINEMENT AND NORMAL FORMS

Introduction to Schema Refinement, Functional Dependencies, Reasoning about FDs, Normal Forms - 1NF, 2NF, 3NF, BCNF, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies - 4NF, 5NF, DKNF, Case Studies.

UNIT–VI : TRANSACTION MANAGEMENT

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability.

UNIT –VII : CONCURRENCY CONTROL AND RECOVERY SYSTEM

Concurrency Control: Lock Based protocols, Time-Stamp Based Protocols, Validation based Protocols, Multiple Granularity, and Deadlock Handling.

Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Shadow Paging, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Non-volatile Storage, Advanced Recovery Techniques, Remote Backup Systems.

UNIT –VIII : OVERVIEW OF STORAGE AND INDEXING

Data on External Storage, File Organizations and Indexing, Index Data Structures, Comparison of File Organizations, Indexes and Performance Tuning.

Tree-Structured Indexing: Intuition for Tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Tree Structure.

TEXTBOOK:

1. Raghurama Krishnan, Johannes Gehrke, *Database Management Systems,* 3rd edition, Tata McGrawHill, 2007.

REFERENCE BOOKS:

1. Elmasri Navate, *Fundamentals of Database Systems,* Pearson Education,1994.
2. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, *Database System Concepts,* 5th edition, McGraw-Hill, 2005.
3. Peter Rob and Carlos Coronel, *Database Systems Design, Implementation, and Management,* 7th edition, 2009.
4. Pranab Kumar Das Gupta, *Database Management System Oracle SQL and PL/SQL,* PHI Learning Private Limited, 2009.

B.Tech. IV Year II Semester

10BT70521 : OPERATING SYSTEM PRINCIPLES

(ELECTIVE-III)

L	T	P	C
4	1	-	4

UNIT-I : OPERATING SYSTEMS OVERVIEW

What operating systems do, operating systems operations, process management, memory management, storage management, protection and security, distributed systems, special purpose systems, operating systems structures: operating system services and systems calls.

UNIT-II : PROCESS MANAGEMENT

Process concepts and scheduling operations on processes, threads and inter process communication, scheduling criteria, scheduling algorithms.

UNIT-III : CONCURRENCY AND SYNCHRONIZATION

Process synchronization, critical-section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, monitors.

UNIT-IV : DEADLOCKS

System model, deadlock characterization, methods for handling deadlock, deadlock prevention, detection and avoidance, recovery form deadlock, Bankers algorithm.

UNIT-V : MEMORY MANAGEMENT

Logical versus physical address space, swapping, contiguous memory allocation, paging, segmentation, demand paging, performance of demand paging, page-replacement algorithms, thrashing.

UNIT-VI : FILE SYSTEM

File System interface: Concept of a file, access methods, directory structure, file system mounting, file sharing, protection.

File system implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management.

UNIT-VII : I/O SYSTEM

Mass-storage structure: Overview of mass-storage structure, disk structure, disk attachment, disk scheduling algorithms, swap-space management, RAID structure, stable-storage implementation, tertiary storage structure.

UNIT-VIII : SECURITY

The security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks.

TEXT BOOK:

1. Peter Baer Galvin Abraham Silberchatz, Greg Gagne, *Operating System Principles*, 7th edition, John Wiley.

REFERENCE BOOKS:

1. Stallings, *Operating Systems: Internals and Design Principle*s, 5th edition, Pearson Education, 2008.
2. Andrew S. Tanenbaum, *Modern Operating Systems,* 2th edition, Prentice Hall India.
3. Crowley, *Operating System A Design Approach,* 2th edition, Tata McGraw-Hill.
4. Dhamdhere, *Operating Systems,* Tata McGraw-Hill, 2006.

B.Tech. IV Year II Semester

10BT71301 : NEURAL NETWORKS AND FUZZY SYSTEMS

(ELECTIVE - III)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS

Introduction, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Types of Neuron Activation Function, ANN Architectures, Supervised, Unsupervised, Reinforced Learning, Potential applications to ANN.

UNIT-II : FEED FORWARD NETWORKS

Perceptron Models, Learning Rules, Hebbian Learning Rule, Perceptron Learning Rule, Delta Learning Rule, Back propagation, Architecture, Calculation of error, Training algorithm, Applications, Kohenen Self organizing Feature map, Architecture, Training, Learning Vector Quantizer (LVQ).

UNIT-III : FEEDBACK AND COUNTER PROPAGATION NETWORKS

Hopfield network, Architecture, Training algorithm, Application. Full Counter Propagation Network (Full CPN), Architecture, Training Phases of Full CPN, Training Algorithm, Application.

UNIT-IV : ASSOCIATIVE MEMORIES

General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms, Basic architecture BAM Energy Function, Adaptive resonant Theory, ART1, ART2, Architecture, Algorithm, Applications.

UNIT-V : CLASSICAL AND FUZZY SETS

Introduction to classical sets, properties, Fuzzy sets, Membership functions, Classical Relations and Fuzzy Relations, Composition.

UNIT-VI : FUZZY LOGIC SYSTEM COMPONENTS

Properties of Membership Functions, Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification, methods, α-cuts for Fuzzy Relations, Extension principle.

UNIT-VII : FUZZY SYSTEMS

Natural Language, Linguistic Hedges, Fuzzy (Rule-Based) Systems, Graphical Techniques of Inference, Fuzzy Control Systems, Control System Design Problem, Simple Fuzzy Logic Controllers-Examples.

UNIT-VIII : NEURAL NETWORK AND FUZZY APPLICATIONS

Neural network applications: Load forecasting, Process identification, control and fault diagnosis (Image Processing).

Fuzzy logic applications: Temperature control, Cruise control application, Air conditioner control, DC motor speed control.

TEXT BOOKS:

1. S. Rajasekharan and G. A. Vijayalakshmi Pai, *Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications*, PHI Publication, 2004.
2. Timothy J. Ross, *Fuzzy Logic with Engineering Applications*, McGraw-Hill Inc. 1997

REFERENCE BOOKS:

1. Simon Haykin, *Neural Networks- A Comprehensive Foundation,* Pearson Education, 2001.
2. S.N.Sivanandam, S.Sumathi,S. N. Deepa, *Introduction to Neural Networks using MATLAB 6.0,* TMH, 2006.
3. Philip D.Wasserman, *Neural Computing*, Wiley Publications.

B.Tech. IV Year II Semester

10BT4EC01 : OPTIMIZATION TECHNIQUES

(ELECTIVE - III)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO OPTIMIZATION TECHNIQUES

Statement of an optimization problem, design vector, design constraints, constraint surface, objective function, objective function surfaces, classification of optimization problems.

UNIT-II : CLASSICAL OPTIMIZATION TECHNIQUES

Single variable optimization, multi variable optimization without constraints, necessary and sufficient conditions for minimum/ maximum, multivariable optimization with equality constraints, solution by method of lagrange multipliers, multivariable optimization with inequality constraints, Kuhn - Tucker conditions.

UNIT-III : INTRODUCTION TO LINEAR PROGRAMMING

Standard form of a linear programming problem, geometry of linear programming problems, definitions and theorems, solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations, motivation to the simplex method, simplex algorithm, big M-method, dual simplex algorithm.

UNIT-IV : TRANSPORTATION PROBLEM AND CONVEX PROGRAMMING

Finding initial basic feasible solution by North-West corner rule, least cost method and Vogel's approximation method, Assignment problems, variants, Integer Programming, Branch and bound technique, Convex programming.

UNIT-V : UNCONSTRAINED NONLINEAR PROGRAMMING:

One-dimensional minimization methods: Classification, Fibonacci method, Problems and Quadratic interpolation method, Problems.

UNIT-VI : UNCONSTRAINED OPTIMIZATION TECHNIQUES

Univariate method, Problems, Powell's Method, Conjugate directions, Algorithms, Problems, Steepest Descent (Cauchy) Method, Problems.

UNIT-VII : CONSTRAINED NONLINEAR PROGRAMMING

Characteristics of a constrained problem, classification, basic approach of penalty function method; basic approaches of interior and exterior penalty function methods.

UNIT-VIII : DYNAMIC PROGRAMMING

Dynamic programming, multistage decision processes, types, concept of sub optimization and the principle of optimality, computational procedure in dynamic programming, examples illustrating the calculus method of solution, examples illustrating the tabular method of solution.

TEXT BOOKS:

1. S. S. Rao, Engineering optimization: Theory and practice, 3rd edi tion, New Age International (P) Limited, 1998.
2. S.D. Sharma, Operations Research, Kedarnath Ram Nath and Co. Publications, Meerut, 2003.

REFERENCE BOOKS:

1. H.A. Taha, Operations Research: An Introduction, 6th edition, Prentice Hall India Pvt. Ltd.
2. Kanthi Swaroop, Gupta and Mohan, Introduction to Operations Research, 2006.

B.Tech. IV Year II Semester

10BT80201 : EHVAC TRANSMISSION

(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I : PRELIMINARIES

Necessity of EHVAC transmission advantages and problems, power handling capacity and line losses, mechanical considerations, resistance of conductors, properties of bundled conductors, bundle spacing and bundle radius, examples.

UNIT-II : LINE AND GROUND REACTIVE PARAMETERS

Line inductance and capacitance, sequence inductances and capacitances, modes of propagation, ground return, examples.

UNIT-III : VOLTAGE GRADIENTS OF CONDUCTORS

Electrostatics, field of sphere gap, field of line charges and properties, charge, potential relations for multi-conductors, surface voltage gradient on conductors, distribution of voltage gradient on sub-conductors of bundle, examples.

UNIT-IV : CORONA EFFECTS - I

Power loss and Audible Noise (AN), corona loss formulae, charge voltage diagram, generation, characteristics, limits and measurements of AN, relation between 1-phase and 3-phase AN levels, examples.

UNIT-V : CORONA EFFECTS - II

Radio Interference (RI), corona pulses generation, properties, limits, frequency spectrum, modes of propagation, excitation function, measurement of RI, RIV and excitation functions, examples.

UNIT-VI : ELECTROSTATIC FIELD

Calculation of electrostatic field of EHVAC lines, effect on humans, animals and plants, electrostatic induction in unenergised circuit of double circuit line, electromagnetic interference, examples.

UNIT-VII : POWER FREQUENCY VOLTAGE CONTROL AND OVER VOLTAGES IN EHV LINES

No load voltage, charging currents at power frequency, voltage control, shunt and series compensation, static VAR compensation.

UNIT-VIII : DESIGN OF EHV LINES AND EHV CABLES

Design of EHV lines based on steady state and transient limits, EHV cables and their characteristics.

TEXT BOOK:

1. Rakosh Das Begamudre, *Extra High Voltage AC Transmission Engineering*, 3rd Edition, New Age International Pvt. Ltd, 2006.

REFERENCE BOOKS:

1. Edison Electric Institution (GEC), *EHV Transmission Line Refer ence Book*, Edison House, 1986.
2. S. Rao, *EHVAC, HVDC Transmission and Distribution Engineering*, Khanna Publishers, 2001.

B.Tech. IV Year II Semester

10BT80202 : DISTRIBUTION OF ELECTRICAL POWER

(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I : GENERAL CONCEPTS

Introduction to distribution systems, load modeling and characteristics, coincidence factor, contribution factor, loss factor, relationship between the load factor and loss factor, classification of loads (residential, commercial, agricultural and industrial) and their characteristics.

UNIT-II : DISTRIBUTION FEEDERS

Design considerations of distribution feeders, radial and loop types of primary feeders, voltage levels, feeder loading - basic design practice of the secondary distribution system.

UNIT- III : SYSTEM ANALYSIS

Voltage drop and power loss calculations, derivation for voltage drop and power loss in lines, manual methods of solution for radial networks, three phase balanced primary lines, non three phase primary lines and load flow analysis of systems.

UNIT-IV : DISTRIBUTION SYSTEM PROTECTION

Types of common faults and procedure for fault calculation, objectives of distribution system protection, principle of operation of fuses, circuit reclosers, line sectionalizer and circuit breakers, coordination of protective devices.

UNIT-V : APPLICATION OF CAPACITORS IN DISTRIBUTION SYSTEM

Different types of power capacitors, shunt and series capacitors, effect of shunt capacitors (fixed and switched) for power factor correction, economic justification for capacitors, procedure to determine the optimum capacitor allocation.

UNIT-VI : VOLTAGE CONTROL

Quality of service and voltage standards, voltage fluctuations, voltage control, feeder voltage regulators, effect of series capacitors, effect of AVB/AVR, line drop compensation.

UNIT-VII : DISTRIBUTION SYSTEM PLANNING

Factors affecting system planning, load forecasting, classification of load forecasting, substation expansion, distribution system planning models, present distribution system planning techniques.

UNIT-VIII : AUTOMATION AND REAL TIME MANAGEMENT

Need for distribution automation, distribution system automation, distribution automation and control functions, communication in distribution system, distribution management, functions of DMS, distribution automation and management functionalities.

TEXT BOOKS:

1. Turan Gonen, *Electric Power Distribution System Engineering*, McGraw-Hill Book Company, 1986.
2. S. Sivanagaraju, V.Sankar, *Electrical Power Distribution and Automation*, Dhanpat Rai & Co, 2006.

REFERENCE BOOKS:

1. A.S. Pabla, *Electric Power Distribution,* 4th edition, Tata McGraw-Hill Publishing Company, 1997.
2. V. Kamaraju, *Electrical Power Distribution Systems,* Right Publishers, 2001.

B.Tech. IV Year II Semester

10BT80203 : HIGH VOLTAGE ENGINEERING

(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I : INTRODUCTION TO HIGH VOLTAGE TECHNOLOGY AND APPLICATIONS

Electric field stresses, gas/vaccum as insulator, liquid dielectrics, solids and composites, estimation and control of electric stress, applications of insulating materials in transformers, rotating machines, circuit breakers, cable power capacitors and bushings.

UNIT-II : BREAKDOWN IN GASEOUS AND LIQUID DIELECTRICS

Gases as insulating media, collision process, ionization process, Townsend's criteria of breakdown in gases, and pachen's law, liquid as insulator, pure and commercial liquids, breakdown in pure and commercial liquids.

UNIT-III : BREAKDOWN IN SOLID DIELECTRICS

Intrinsic breakdown, electromechanical breakdown, thermal breakdown, breakdown of solid dielectrics in practice, breakdown in composite dielectrics, solid dielectrics used in practice.

UNIT-IV : GENERATION OF HIGH DC AND AC VOLTAGES

Generation of high DC voltages - rectifiers, voltage doubler circuits, voltage multiplier circuits, voltage drop and regulation, vandegraaf generators, electrostatic generators, generation of high alternating voltages-cascade transformers, resonant transformers, tesla coil - problems.

UNIT-V : GENERATION OF IMPULSE VOLTAGES AND CURRENTS

Generation of impulse voltages-impulse wave shapes theoritical representation, wave shape control, Marx circuit, components of multistage impulse generator. Generation of impulse currents, impulse current generator, tripping and control of impulse generator - problems.

UNIT-VI : MEASUREMENT OF HIGH VOLTAGES AND CURRENTS

Measurement of high direct current voltages, measurement of high voltages alternating and impulse, measurement of high currents-direct, alternating and impulse, oscilloscope for impulse voltage and current measurements.

UNIT-VII : NON-DESTRUCTIVE TESTING OF MATERIAL AND ELECTRICAL APPARATUS

Measurement of dc resistivity, measurement of dielectric constant and loss factor, partial discharge measurements.

UNIT-VIII : HIGH VOLTAGE TESTING OF ELECTRICAL APPARATUS

Testing of insulators and bushings, testing of isolators and circuit breakers, testing of cables, testing of transformers, testing of surge arresters, radio interference measurements.

TEXT BOOKS:

1. M.S. Naidu and V.Kamaraju, *High Voltage Engineering,* 4th edition, Tata McGraw-Hill Publications, 2008.
2. Elsevier E.Kuffel,W.S.Zaengl, J.Kuffel, *High Voltage Engineering: Fundamentals,* 2nd edition, 2005.

REFERENCE BOOKS:

1. C.L.Wadhwa, *High Voltage Engineering,* 2nd edition, New Age International (P) Limited, 2007.
2. Ravindra Arora and Wolfgang Mosch, *High Voltage Insulation Engineering,* New Age International (P) Limited, 1995.

B.Tech. IV Year II Semester

10BT80204 : RELIABILITY ENGINEERING AND APPLICATIONS TO POWER SYSTEMS

(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I : BASIC PROBABILITY THEORY

Probability concept, elements of probability theory, random variables (continuous, discrete variables), density function and distribution functions, mean, standard deviation, variance, probability distributions: Exponential distribution, Binomial distribution, Poisson distribution, Normal distribution, Weibull distribution, Log Normal distribution.

UNIT-II : RELIABILITY FUNCTIONS

Definition of reliability, component reliability, hazard rate, derivation of the reliability function in terms of the hazard rate, Bath tub curve, MTTF, MTTR, MTBF, types of failures (early failures, chance failures and wear-out failures), reliability block diagrams, series and parallel systems, series-parallel systems, parallel-series systems.

UNIT-III : NETWORK MODELING

Reliability evaluation of non series-parallel systems configurations, cut-set, basic cut-set, Tie-set, and basic Tie-set, minimal cut-set, minimal Tie-set and decomposition methods, deduction of the minimal cut-sets from the minimal paths, standby redundant systems, concept of redundancy, perfect switching, imperfect switching, event trees.

UNIT-IV : MARKOV MODELING

Introduction, Markov process and Markov chain, STPM, time dependant probability, functions, evaluating limiting state probabilities, Markov process, one component repairable model, two component repairable model, three component repairable model.

UNIT-V : GENERATION SYSTEM RELIABILITY ANALYSIS

Introduction, generation system model, identical units,determination of capacity outage probability table, determination of transitional rates, non-identical units, determination of capacity outage probability table, reducing the states by combining equal capacity states, determination of transitional rates, sequential addition method, recursive relation for unit addition, unit removal, LOLP , LOLE determination.

UNIT-VI : FREQUENCY AND DURATION TECHNIQUES

Frequency and duration concepts, two components repairable model (with identical components), evaluation of cumulative probability, cumulative frequency and equivalent transition rates.

UNIT-VII : COMPOSITE SYSTEM RELIABILITY ANALYSIS

Two level representation of daily load modeling, merging of generation and load models, evaluation of probabilities, transitional rates, decomposition method, weather effects on transmission lines-circuit breaker model.

UNIT-VIII : DISTRIBUTION SYSTEM AND RELIABILITY ANALYSIS

Basic indices, customer oriented indices, load and energy indices, radial networks - problems.

TEXT BOOKS:

1. Roy Billinton and Ronald N Allen, *Reliability Evaluation of Engineering Systems*, Plenum Press, New York and London (BS Publications, Revised edition), 2007.
2. Roy Billinton and Ronald N Allen, R*eliability Evaluation of Power Systems,* Plenum Press, New York and London 2nd edition (BS Publications, Revised edition), 2007.

REFERENCE BOOKS:

1. Charles E. Ebeling, *An Introduction to Reliability and Maintainability Engineering*, Tata McGraw-Hill edition, 2000.
2. LS Sainath, *Reliability Engineering*, 3rd edition, Affiliated East West Pvt. Ltd., 1991.
3. Balaguru Swamy, *Reliability Engineering*, Tata McGraw-Hill edition, 1984.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (yearly pattern)

Common to ECE, EEE, EIE, E Con E , CSE, CSSE and IT

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT1BS04	Mathematical Methods	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics and Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language and Communication skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering and IT workshop	-	-	3	4	25	50	75
	TOTAL	**15**	**6**	**15**	**50**	**305**	**670**	**975**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

ELECTRONICS AND INSTRUMENTATION ENGINEERING

COURSE STRUCTURE (2011-2012)

II B.Tech. I Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT3BS03	Special Functions and Complex Analysis	4	1	-	4	30	70	100
10BT30401	Semiconductor Devices and Circuits	4	1	-	4	30	70	100
10BT30223	Circuit Theory	4	1	-	4	30	70	100
10BT40404	Switching Theory and Logic Design	4	1	-	4	30	70	100
10BT31001	Thermodynamics and Fluid Mechanics	4	1	-	4	30	70	100
10BT30403	Signals and Systems	4	1	-	4	30	70	100
10BT30411	Semiconductor Devices and Circuits Lab	-	-	3	2	25	50	75
10BT30412	Simulation Lab	-	-	3	2	25	50	75
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

II B.Tech. II Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT41301	Control Systems	4	1	-	4	30	70	100
10BT41001	Electrical and Electronic Measurements	4	1	-	4	30	70	100
10BT41002	Transducers in Instrumentation	4	-	-	4	30	70	100
10BT40401	Electronic Circuit Analysis	4	-	-	4	30	70	100
10BT40221	Principles of Electrical Engineering	4	1	-	4	30	70	100
10BT40402	Pulse and Digital Circuits	4	-	-	4	30	70	100
10BT40231	Electrical Engineering Lab	-	-	3	2	25	50	75
10BT40411	Electronic Circuits Lab	-	-	3	2	25	50	75
10BT4HS02	Audit Course: Advanced English Communication Skills	-	3	-	-	-	-	-
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

ELECTRONICS AND INSTRUMENTATION ENGINEERING

COURSE STRUCTURE (2011-2012)

III B.Tech. I Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT50421	Electromagnetic Theory	4	1	-	4	30	70	100
10BT50422	Linear and Digital IC Applications	4	1	-	4	30	70	100
10BT40501	Computer Architecture and Organization	4	1	-	4	30	70	100
10BT51001	Process Control Instrumentation	4	1	-	4	30	70	100
10BT3BS02	Environmental Sciences	4	1	-	4	30	70	100
10BT51002	Industrial Instrumentation	4	1	-	4	30	70	100
10BT50431	IC & PDC Lab	-	-	3	2	25	50	75
10BT51011	Measurements and Transducers Lab	-	-	3	2	25	50	75
	Total	**24**	**6**	**6**	**28**	**230**	**520**	**750**

III B.Tech. II Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT4HS01	Managerial Economics and Principles of Accountancy	4	1	-	4	30	70	100
10BT60404	Microprocessors and Microcontrollers	4	1	-	4	30	70	100
10BT60401	Digital Signal Processing	4	1	-	4	30	70	100
10BT50423	Principles of Communications	4	1	-	4	30	70	100
10BT61001	Optoelectronic and Laser Instrumentation	4	1	-	4	30	70	100
10BT61002	Biomedical Instrumentation	4	1	-	4	30	70	100
10BT60411	Microprocessors and Microcontrollers Lab	-	-	3	2	25	50	75
10BT61011	Process Control Lab	-	-	3	2	25	50	75
10BT61012	Seminar	-	-	-	2	75	-	75
	Total	**24**	**6**	**6**	**30**	**305**	**520**	**825**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

ELECTRONICS AND INSTRUMENTATION ENGINEERING

COURSE STRUCTURE (2011-2012)

IV B.Tech. I Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
10BT71001	Analytical Instrumentation	4	1	-	4	30	70	100
10BT71002	Automation of Industrial Processes	4	1	-	4	30	70	100
10BT40502	Object Oriented Programming	4	1	-	4	30	70	100
10BT71003 10BT71004 10BT71005 10BT71006	***Elective – I:*** a) Power Plant Instrumentation b) Petrochemical Plant Instrumentation c) MEMS and Microsystems d) Virtual Instrumentation	4	-	-	4	30	70	100
10BT61202 10BT71301 10BT71007 10BT70402	***Elective – II:*** a) Computer Networks b) Neural Network and Fuzzy Systems c) Telemetry and Tele - Control d) Digital Image Processing	4	1	-	4	30	70	100
10BT71011	Analytical and Biomedical Instrumentation Lab	-	-	3	2	25	50	75
10BT71012	PLC and LabView Programming Lab	-	-	3	2	25	50	75
10BT71013	Mini-Project	-	-	-	2	25	50	75
10BT7HS01	Audit Course: Professional Ethics	2						
	Total	**26**	**4**	**6**	**30**	**255**	**570**	**825**

IV B.Tech. II Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT81001	Industrial Electronics	4	1	-	4	30	70	100
10BT60405 10BT70521 10BT70405 10BT70421	***Elective – III:*** a) VLSI Design b) Operating System Principles c) Embedded and Real Time Systems d) Advanced Microprocessors and Microcontrollers	4	1	-	4	30	70	100
10BT4EC01 10BT61302 10BT81302 10BT51301	***Elective – IV:*** a) Optimization Techniques b) Robotics and Automation c) Adaptive Control Systems d) Advanced Control Systems	4	1	-	4	30	70	100
10BT81011	Comprehensive Viva-Voce	-	-	-	2	100	-	100
10BT81012	Project work	-	-	12	12	75	150	225
	Total	**12**	**3**	**12**	**26**	**265**	**360**	**625**

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT1BS04: MATHEMATICAL METHODS

(Common to CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT–I

Matrices and Linear System of Equations : Rank of a matrix, echelon form, normal form, inverse of a matrix by normal form. Homogenous and non-homogenous linear systems, consistency and solutions of linear system of equations. Direct methods, Gauss elimination method, Gauss Siedel, Gauss Jordan method, factorization method.

UNIT-II

Eigen Values and Eigen Vectors : Definitions, evaluation of eigen values, eigen vectors and properties. Cayley Hamilton theorem (without proof), inverse and powers of a matrix by Cayley Hamilton theorem, diagonalization of a matrix, quadratic forms and reduction to its normal form (problems dealing with distinct eigen values only).

UNIT-III

Algebraic, Transcendental Equations and Curve Fitting: Solutions of algebraic and transcendental equations by bisection method, false position method, Newton-Raphson's method, iterative method. Curve fitting by the principle of least squares, fitting of a straight line, parabola, exponential and power curves.

UNIT-IV

Interpolation: Interpolation, forward difference operator, backward difference operator, central difference operator, relationship between operators, Newton's forward formula, Newton's backward formula, Gauss forward formula, Gauss backward formula, Lagranges interpolation formula.

UNIT-V

Numerical Differentiation and Integration: Numerical values of derivatives using Newton's forward formula, Newton's backward formula.

Numerical Integration: Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule.

UNIT-VI

Numerical Solutions of Ordinary Differential Equations: Numerical solutions of ordinary differential equations using Taylor series, Euler's method, modified Euler's method, Runge–Kutta method (2^{nd} and 4^{th} orders only), Milne's predictor corrector method.

UNIT-VII

Z – Transformations: Z–transforms, inverse Z–transform, properties, damping rule, shifting rule, initial and final value theorems. Convolution theorem, solution of difference equations by Z–transforms.

UNIT-VIII

Fourier Series and Fourier Transforms: Definition, Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd function, half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, properties, inverse transform, finite Fourier transforms.

TEXTBOOK:

Mathematical Methods, T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganadham and M.V.S.S.N.Prasad, S.Chand and Company, 5^{th} edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36^{th} Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley and Sons, Inc., 8^{th} Edition
3. *Introductory methods of Numerical Analysis ,* S.S.Sastry, Prentice Hall of India, 3^{rd} Edition
4. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3^{rd} Edition

B.Tech. I Year

10BT1EC01: **PROBLEM SOLVING AND COMPUTER PROGRAMMING**

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | $x^2 + y^2$| + $\sqrt{}$2xy
iii) $x^5 + 10\ x^4 + 8\ x^3 + 4\ x + 2$
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS03: **SPECIAL FUNCTIONS AND COMPLEX ANALYSIS**

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : Partial Differential Equations

Formation of Partial differential equations, Solutions of first order Partial Differential Equations using Lagrange's method. Method of separation of variables - solutions of one dimensional wave equation - Heat equation- Two dimensional Laplace equation under boundary conditions.

UNIT-II : Special Functions

Euler's Integrals - Beta and Gamma functions - properties - Relationship between beta and gamma functions- applications - evaluation of improper integrals using Beta and Gamma functions **Bessel function:** Generating function-properties of Bessel functions - recurrence relations-Orthogonality.

UNIT-III : Limits and Continuity - Analytic Functions

Exponential, Trigonometric, logarithmic, Hyperbolic and general power (Z^{C}) - separation of real and imaginary parts - Limits and Continuity of functions. Differentiability - Analyticity - Cauchy Riemann equations- conjugate and harmonic conjugate functions - Milne Thompson method- potential functions.

UNIT-IV : Complex Integration

Line integral - evaluation of line integrals along curves and closed contours - Cauchy's Integral theorem - Cauchy's integral formula - Derivatives of analytic function - generalized integral formula.- Evaluation of integrals using integral formula.

UNIT-V : Complex Power Series

Taylor theorem (with proof) - Laurent's theorem (without proof) - Taylor and Laurent's series expansions of complex functions - Singularities - types - residues - poles of order m.

UNIT-VI : Residue Calculus

Residue theorem - proof - applications - evaluation of integrals using residue theorem - evaluation of improper and real integrals of the type

i) $\int_{-\infty}^{\infty} f(x)dx$ ii) $\int_{0}^{2\Pi} f(\cos\theta,\sin\theta)d\theta$ iii) $\int_{-\infty}^{\infty} e^{imx} f(x)dx$

UNIT-VII : Rouche's Theorem - Applications

Argument principle - Rouche's theorem - determination of number of zeros of complex polynomials - maximum modules principle - Fundamental theorem of Algebra - Cauchy's inequality - Liouville's theorem.

UNIT-VIII : Conformal Mapping

Definitions and examples, Mappings defined by $w = e^z$, ln z, z^2, sinz, cosz. Translation, Rotation, Inversion and Bilinear transformation - properties - fixed point - cross ratio - invariance of circles under bilinear transformation - determination of bilinear transformation using three given points.

TEXT BOOKS:

1. T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, *Mathamatical Methods*, 5th Revised Edition, S. Chand & Company, 2010.
2. T.K.V. Iyenger, B. Krishna Gandhi..et al., *Text book of Engineering Mathematics*, Vol-III, 8th Edition, S. Chand & Company, 2011.

REFERENCE BOOKS:

1. Grewal, B.S., *Higher Engineering Mathematics*, 36th Edition, Khanna Publishers, Delhi.
2. Kreyszig, E., *Advanced Engineering Mathematics*, 8th Edition, John-Wiley.

II B.Tech. I Semester

10BT30401: SEMICONDUCTOR DEVICES AND CIRCUITS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: PN Junction Diode
PN Junction Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical, Static and Dynamic Resistances, Diode Equivalent circuits, Junction capacitances, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

UNIT-II: Rectifiers, Filters and Regulators
Halfwave rectifier and fullwave rectifiers (Qualitative and quantitative analysis), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L - section filter, π - section filter, comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Problems on rectifier circuits.

UNIT-III: Bipolar Junction Transistor
Transistor construction, BJT Operation, Transistor as an amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in Common Emitter, Common Base and Common Collector Configurations, BJT specifications.

UNIT-IV: Transistor Biasing and Stabilization
Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in V_{BE} and β, Bias Compensation Using Diodes and Transistors, Thermal Runaway, Condition for Thermal Stability in CE configuration, Problems on biasing circuits.

UNIT-V: Small Signal Analysis of BJT Amplifiers
BJT Modeling, Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using h-Parameters, Comparison of CB, CE and CC configurations, Simplified Hybrid Model, Millers Theorem, Dual of Millers Theorem.

UNIT-VI: Field Effect Transistor
Construction, Principle of Operation and Characteristics of JFET and MOSFET (Enhancement & Depletion), Small Signal Model of JFET & MOSFET.

UNIT-VII: FET Amplifiers
Common Source, and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, FET as Voltage Variable Resistor, Comparison between BJT and FET.

UNIT-VIII: Special Purpose Electronic Devices
Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR). Principle of operation of Schottky Barrier Diode.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits,* 1991 Edition, TMH, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits,* 9th Edition, PHI, 2006.
3. David A. Bell, *Electronic Devices and Circuits,* 5th Edition, Oxford University press, 2008.

REFERENCE BOOKS:

1. J. Millman and C.C. Halkias, *Integrated Electronics*, TMH, 2nd Edition, 1998.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2nd Edition, BSP, 2005.
3. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7th Edition, PHI, 2005.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd Edition, TMH, 2008.
5. Henry and Jeager, *Semiconductor Devices and Circuits,* Mc-Graw Hill.

II B.Tech. I Semester

10BT30223: **CIRCUIT THEORY**
(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : Fundamentals of Electrical Circuits

Concepts of charge, current, voltage and power, active & passive elements, reference concepts of direction for voltages & currents, voltage and current relationships for passive elements, Ohm's law, Kirchoff Laws, current division and voltage division rules, network reduction techniques, series, parallel, series-parallel circuits, star-delta and delta-star transformations, source transformation.

UNIT-II : Basic Nodal & Mesh Analysis

Basic definitions: node, path, loop, branch , nodal analysis and super node concept, mesh analysis and super mesh concept - problems.

UNIT-III : Fundamentals of AC Circuits

Introduction - advantages of AC supply, types of waveforms, importance of sinusoidal waveforms, basic definitions: waveform, cycle, time period, frequency, amplitude, determination of average and RMS value, form factor & peak factor for different alternating waveforms, phase and phase difference.

UNIT-IV : Single Phase AC Circuits

Sinusoidal response of R, L, C combination of R, L, C circuits, concept of impedance and power triangles, power factor, resonance, bandwidth and quality factor for series and parallel networks, locus diagram.

UNIT-V : Transient Analysis

Introduction - transient response of RL, RC and RLC for DC excitation, transient response of RL, RC and RLC for sinusoidal excitation, numerical problems.

UNIT-VI : Magnetically Coupled Circuits

Coupled circuits, self & mutual inductance, DOT conventions, coefficient of coupling, analysis of magnetic circuits: series, parallel and composite, comparison of electrical and magnetic circuits.

UNIT-VII : Network Theorems - I
Thevenin's, Norton's, Maximum power transfer and Superposition theorems for DC and sinusoidal excitations - applications.

UNIT-VIII : Network Theorems - II
Tellegen's, Millman's, Reciprocity, Substitution and Compensation theorems for DC and sinusoidal excitation - applications.

TEXT BOOKS:

1. A. Sudhakar & Shyam Mohan, *Electric Circuits*, Tata McGraw-Hill Company, 3rd Edition, 2007.
2. A. Chakrabarthi, *Circuits Theory*, Dhanpat Rai & Co, New Delhi, 2009.

REFERENCE BOOKS:

1. M.E. Van Valkenberg, *Network Analysis,* 3rd Edition, Pearson Publications, New Delhi, 2006.
2. William H. Hayt & Jack E. Kennedy & Steven M. Durbin, *Engineering Circuit Analysis*, 6th Edition, Tata McGraw-Hill Company, 2009.
3. J.A. Edminister & M.D.Nahvy, *Theory and Problems of Electric Circuits,* Schaums Outline Series,4th Edition, Tata McGraw-Hill company, New Delhi, 2004.
4. G. K. Mittal, Ravi Mittal, *Network Analysis*, 14th Edition, Khanna Publishers, New Delhi, 1997.
5. C. K. Alexander and M. N. O. Sadiku, *Fundamentals of Electric Circuits*, 3rd Edition, Tata McGraw-Hill Publishing Company, New Delhi, 2010.

II B.Tech. I Semester

10BT40404: SWITCHING THEORY AND LOGIC DESIGN

(Common to EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: Number Systems & Codes
Philosophy of number systems – complement representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

UNIT-II: Boolean Algebra and Switching Functions
Fundamental postulates of Boolean Algebra, Basic theorems and properties, switching functions, Canonical and Standard forms, algebraic simplification, digital logic gates, properties of XOR gate, universal gates, Multilevel NAND/NOR realizations.

UNIT-III: Minimization of Switching Functions
Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, simplification rules.

UNIT-IV: Combinational Logic Design
Design using conventional logic gates-Binary Adders, Subtractors, Look ahead carry generator, Decimal adder-BCD adder, Binary multiplier, Modular design using IC chips-Magnitude comparator, Encoder, Decoder, Multiplexer- MUX Realization of switching functions, De-Multiplexer, Parity bit generator, Code-converters, Hazards and hazard free realizations.

UNIT-V: Programmable Logic Devices, Threshold Logic
Basic PLD's-ROM, PROM, PLA, PAL, Realization of Switching functions using PLD's. Capabilities and limitations of Threshold gate, synthesis of threshold functions, multigate synthesis.

UNIT-VI: Sequential Circuits - I
Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples),Basic flip-flops, Triggering and excitation tables, Steps in synchronous sequential circuit design, Design of Synchronous counters – modulo-N, up/down counter, ring counter, Johnson counter, Design of Asynchronous counter-modulo-N , Sequence detector, Serial binary adder.

UNIT-VII: Sequential Circuits - II
Finite state machine-capabilities and limitations, Mealy and Moore models, minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods, concept of minimal cover table.

UNIT-VIII: Algorithmic State Machines
Salient features of the ASM chart, Simple examples, System design using data path and control subsystems, control implementations, examples of Weighing machine and Binary multiplier.

TEXT BOOKS:
1. Morris Mano, *Digital Design,* 3rd Edition, PHI.
2. Zvi Kohavi, *Switching & Finite Automata theory,* 2nd Edition, TMH.

REFERENCE BOOKS:
1. Charles H. Roth, *Fundamentals of Logic Design*, 5th Edition, Thomson Publications, 2004.
2. Fletcher, *An Engineering Approach to Digital Design,* 1st Edition, PHI, 2005.
3. John M. Yarbrough, *Digital Logic Applications and Design,* Thomson Publications, 2006.
4. A Anand Kumar, *Switching Theory and Logic Design,* PHI, 2008.

II B.Tech. I Semester

10BT31001: THERMODYNAMICS AND FLUID MECHANICS

L	T	P	C
4	1	-	4

UNIT-I: Laws of Thermodynamics
Basic concept, Thermodynamic systems and processes, Zeroth law of Thermodynamics: Concept of temperature, First law of Thermodynamics: Concept of internal energy and enthalpy, applications to open and closed systems, Second law of Thermodynamics: Concept of entropy.

UNIT-II: Thermodynamic Air Cycles and Air Compressors
Introduction, Thermodynamic air cycles, Comparison of cycles, Concepts on properties of gases & gas mixtures.
Air compressors: Classifications, Working principles of Rotary and Positive displacement compressors, Single stage and Multistage compressors.

UNIT-III: Thermodynamic Vapour Power Cycles and Steam Boilers: Properties of steam, Thermodynamic vapour cycles, Rankine cycle with modifications, Types of Calorimeters, Steam boilers, Boiler Mountings and Accessories.

UNIT-IV: Refrigeration and Heat Transfer
Basic concepts of refrigeration, Various methods of producing refrigerating effects, Air conditioning process.
Basic concepts of Heat Transfer, One dimensional heat conduction: Plain wall and composite walls, Basic concept of Radiation.

UNIT-V: Basic Concepts of Fluid Mechanics
Introduction, Types of fluids, Properties, Laws of pressure, Atmospheric Pressure, Gauge Pressure. Pressure Measurement: Piezometer, Manometers and Mechanical Gauges.

UNIT-VI: Analysis of Flow of Fluids
Stream line, path line and streak lines and stream tube, classification of various fluid flows, Equation of Continuity for one dimensional flow, Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its applications on force on pipe bend, Flow measuring devices and its basic problems.

UNIT-VII: Dimensional and Model Analysis
Introduction, Dimensions, Dimensional Homogeneity, Methods of Dimensional analysis, Model analysis introduction, Similitude, Dimensionless Numbers and their significance, Model or Similarity laws.

UNIT-VIII: Hydraulic machines
Pumps: Basic concepts, Classifications, Working principles of Centrifugal and Reciprocating pumps.
Turbines: Basic concepts, Classifications, Working Principles of various turbines, efficiencies, basic problems.

TEXT BOOKS:
1. P.K.Nag, *Engineering Thermodynamics*, TMH.
2. R.K.Rajput, *Fluid Mechanics and Hydraulic Machines*, Revised 2nd Edition, S.Chand and company Ltd., 2002.

REFERENCE BOOKS:
1. R.K.Rajput, *Thermal Engineering*, Laxmi Publications (P) Ltd.
2. R.K.Bansal, *Fluid Mechanics*, Laxmi Publications (P) Ltd.
3. Dr. D.S. Kumar, *Fluid Mechanics and Fluid Power Engineering*, S.K.Kataria and sons.
4. Dr. P.N.Modi and Dr. S.M.Seth, *Hydraulics and Fluid Mechanics Including Hydraulics Machines*, 18th Edition, Standard Book House, Rajsons Publications(P) Ltd, 2011.

II B.Tech. I Semester

10BT30403: **SIGNALS AND SYSTEMS**

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: Signal Analysis

Signal definition, classification of signals, basic operations on signals, Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

UNIT-II: Fourier Series Representation of Periodic Signals

Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum.

UNIT-III: Fourier Transforms

Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT-IV: Signal Transmission Through Linear Systems

System definition, classification of systems, Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

UNIT-V: Convolution and Correlation of Signals
Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function. Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT-VI: Laplace Transforms
Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's, relation between L.T's and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT-VII: Sampling
Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT-VIII: Z–Transforms
Discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms.

TEXT BOOKS:

1. B.P. Lathi, *Signals, Systems & Communications,* BS Publications, 2003.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, *Signals and Systems,* 2nd Edition, PHI.
3. Simon Haykin and Van Veen, *Signals & Systems,* 2nd Edition, Wiley.

REFERENCE BOOKS:

1. M.E. Van Valkenburg, *Network Analysis,* 3rd Edition, PHI Publications, 2000.
2. Michel J. Robert, *Fundamentals of Signals and Systems,* MGH International Edition, 2008.
3. C. L. Philips, J.M.Parr and Eve A.Riskin, *Signals, Systems and Transforms,* 3rd Edition, Pearson Education, 2004.

II B.Tech. I Semester

10BT30411: SEMICONDUCTOR DEVICES AND CIRCUITS LAB

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

PART A: (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs.
2. Identification, Specifications and Testing of Active Devices: Diodes, BJTs, Low-power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIAC, TRIAC, Linear and Digital ICs.
3. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO.

PART B: (Minimum of 10 experiments to be conducted)

1. Forward and Reverse bias characteristics of PN Junction diode.
2. Zener diode characteristics and Zener as Voltage Regulator.
3. Input and Output characteristics of Transistor in CB Configuration.
4. Input and Output characteristics of Transistor in CE Configuration.
5. Half wave Rectifier With and without filters.
6. Full wave Rectifier With and without filters.
7. FET characteristics.
8. Measurement of h parameters of transistor in CE configuration.
9. Frequency response of CE Amplifier.
10. Frequency response of CC Amplifier.
11. Frequency response of Common Source FET Amplifier.
12. SCR Characteristics.
13. UJT Characteristics.

II B.Tech. I Semester

10BT30412: **SIMULATION LAB**

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

List of Experiments:

1. Basic Operations on Matrices.
2. Generation of Various signals and Sequences (Periodic and Aperiodic), Such as Unit Impulse, Unit Step, Square, Saw Tooth, Triangular, Sinusoidal, Ramp, Sinc function.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd Parts of Signal or Sequence and Real and Imaginary Parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation and Cross correlation between Signals and Sequences.
7. Verification of Linearity and Time Invariance Properties of a Given Continuous / Discrete System.
8. Computation of Unit Sample, Unit Step and Sinusoidal Responses of the Given LTI System and Verifying its Physical Realizability and Stability Properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given Signal and plotting its Magnitude and Phase Specturm.
11. Waveform Synthesis using Laplace Transform.
12. Locating Zeros and Poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
13. Generation of Gaussian Noise (Real and Complex), Computation of its Mean, M.S. Values and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.
15. Removal of Noise by Auto Correlation / Cross correlation in a given signal corrupted by noise.
16. Impulse response of a raised cosine filter.
17. Verification of Weiner-Khinchine Relations.
18. Checking a Random Process for Stationary in Wide Sense.

II B.Tech. II Semester

10BT41301: CONTROL SYSTEMS
(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: Introduction

Concepts of Control Systems, Open Loop and closed loop control systems, Feed-Back Characteristics, Effects of feedback, Block diagram representation of physical systems, Mathematical models-differential Equations.

UNIT-II: Transfer Function Representation

Analogous systems, electrical analogy of physical systems, Derivation of transfer function, Transfer function of DC Servo motor, Synchro transmitter and receiver, Block diagram algebra, Signal Flow graph and Mason's gain formula.

UNIT-III: Time Response Analysis

Types of test signals, Response of first and second order system, Time domain specifications, type and order of systems, steady state error, static error constants, generalized error co-efficients. Effect of P, PI, PID on time response.

UNIT-IV: Stability Analysis in S-Domain

Concepts of stability: Characteristic equation, location of roots in s-plane for stability, asymptotic stability and relative stability, Routh-Hurwitz stability criterion.

Root Locus Technique: Root locus concept, construction of root loci, effects of adding poles and zeros to G(s) H(s) on the root loci.

UNIT-V: Frequency Response Analysis

Introduction, Frequency domain specifications, Bode diagrams, Determination of Frequency domain specifications and transfer function from the Bode Diagram, Phase margin and Gain margin, Stability Analysis from Bode Plots.

UNIT-VI: Stability Analysis in Frequency Domain

Polar Plots, Nyquist plots, stability in frequency domain using Nyquist stability criterion, simple problems.

UNIT-VII: Design and Compensation of Control Systems Introduction to Compensation networks, Lag, Lead, lead-lag compensation, Compensation using Bode plots.

UNIT-VIII: State Space Analysis of Continuous Systems Concepts of state, state variables and state model, derivation of state model for physical systems Diagonalization, State Transition Matrix and its Properties, Solution of linear state equation, Concepts of Controllability and Observability, Kalman's test only.

TEXT BOOKS:

1. I. J. Nagrath and M. Gopal, *Control Systems Engineering*, 2nd Edition, New Age International (P) Limited.
2. Katsuhiko Ogata, *Modern Control Engineering*, 3rd Edition, Prentice Hall of India Pvt. Ltd.

REFERENCE BOOKS:

1. B.C.Kuo, *Automatic Control Systems*, Weilly Eastern, 2004.
2. Nise, *Control Systems Engineering*, 3rd Edition, John wiley.
3. Richard C. Dorf, Robert H. Bishop, *Modern Control Systems,* 11th Edition, Pearson Education, 2007.
4. Graham Goodwin, Stefan Graebe and Mario Salgado, *Control System Design*, Prentice Hall.

II B.Tech. II Semester

10BT41001: **ELECTRICAL AND ELECTRONIC MEASUREMENTS**

L	T	P	C
4	1	-	4

UNIT-I: Ammeters and Voltmeters

Classification of analog instruments, operating forces: deflecting, control and damping. Construction, working principle and expression of torque equation for PMMC and Moving Iron Instruments. Ammeters and Voltmeters, Range extension of ammeters and voltmeters.

UNIT-II: Ohmmeters and Potentiometers

Series ohmmeter, shunt ohmmeter, multimeters. DC Potentiometers: Basic potentiometer circuit, standardization, Compton's Potentiometers, applications. AC Potentiometers: Standardization, Polar types and Coordinate types, applications.

UNIT-III: Power, Power Factor & Energy Meters

Construction, working principle and expression of torque equation for single phase electrodynamowattmeter, single phase electrodynamo power factor meter and single phase induction energy meter. Testing of energy meter by direct loading, Phantom loading methods.

UNIT-IV: Bridges

Measurement of Resistance**:** Wheatstone bridge, Kelvin bridge, Kelvin double bridge and direct deflection methods. Measurement of Inductance: Maxwell bridge, Hay's bridge and Anderson bridge. Measurement of capacitance: Desauty's bridge and Schering bridge, Q-meter.

UNIT-V: Electronic Instruments

AC voltmeter using rectifiers, true RMS reading Voltmeter, electronic multimeter, digital voltmeters: ramp DVM, staircase ramp DVM, dual slope DVM and successive approximation DVM.

UNIT-VI: Frequency and Time Measurements

Frequency counters: Basic principle, errors associated with counter. Different modes of operations: Frequency, Time, Time Period, Average time period, Totalizing. Frequency synthesizer, Wave meters, Wave Analyzers, Output power meter.

UNIT-VII: Oscilloscopes

Motion of electron in electric and magnetic fields, electrostatic and magnetic focusing, deflection sensitivity in both cases, CRO operation, CRT characteristics, CRO probes, Time base sweep modes, Trigger generator, Vertical amplifier, modes of operations, A, B, alternate & chop modes. Sampling oscilloscopes, storage oscilloscope. Standard specifications of CRO, synchronous selector circuits, Lissajous figures.

UNIT-VIII: Analyzers and Recorders

Spectrum analyzers, different types of spectrum analyzer, recorders, introduction to magnetic recording techniques & X-Y plotters. Display devices and display systems, logic analyzers.

TEXT BOOKS:

1. A.K.Sawhney, *A Course in Electrical and Electronics Measurements and Instrumentation*, Dhanpat Rai and Sons, New Delhi, 1995.
2. H.S. Kalsi, *Electronic Instrumentation*, TMH, 2002.

REFERENCE BOOKS:

1. Cooper W.D & Hlefrick A.D., *Electronic Instrumentation & Measurement Technique*, 3rd Edition, PHI, 1991.
2. Doeblin, E.O., *Measurement Systems: Applications and Design*, 4th Edition, TMH, 2003.
3. David A. Bell, *Electronic Instrumentation and Measurements*, 2nd Edition, PHI, 2003.
4. E.W. Golding & F.C. Widdis, *Electrical Measurements and Measuring Instruments*, 5th Edition, Wheeler Publishing.

II B.Tech. II Semester

10BT41002: **TRANSDUCERS IN INSTRUMENTATION**

(Common to EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I: Introduction to Measurement and Transducers

Block diagram of Measuring System, Units and Standards, Measurement Errors, Statistical analysis of measurement data, Probability Errors, Limiting Errors, Principle of transducer, Classification of transducers.

UNIT-II: Performance Characteristics

Static characteristics: Calibration, accuracy, precision, sensitivity, linearity, resolution, hysteresis, threshold, reproducibility, repeatability, dead space, span, range.

Dynamic characteristics: Generalized mathematical model of measurement system. Zero order, first order and second order measurement systems and their response to Step, Ramp and Impulse inputs. Frequency reponse of first order and second order systems.

UNIT-III: Resistive Transducers

Potentiometers, strain gauges and their types, resistance temperature detector, thermistor, light dependent resistors.

UNIT-IV: Inductive Transducers

Variable reluctance, eddy current, linear variable differential transformers, electromagnetic, synchros, resolvers & inductosyn, magnetoelastic and magnetostrictive.

UNIT-V: Capacitive Transducers

Variable and differential dielectric, variable and differential gap between the plates, variable and differential area, frequency response, measurement of humidity, liquid level, displacement and pressure.

UNIT-VI: Self-Generating Transducers

Thermoelectric transducers, Piezoelectric transducers, Pyroelectric transducers, Photovoltaic transducers, force-balance transducers.

UNIT-VII: Signal Conditioning

Block diagram of signal conditioning, balance and deflection measurement in Wheatstone bridge, measurement of reactance: Push-pull bridge and Blumein bridge. Carrier amplifier, chopper amplifier, low drift amplifier and charge amplifier

UNIT-VIII: Digital and other Transducers

Position encoders, Transducer based on semiconductor junctions: Thermometers, magnetodiodes & magnetotransistors, photodiodes & phototransistors. Fiber-optic transducers, ultrasonic transducers. MEMS and Nanosensors.

TEXT BOOKS:

1. Ramon Pallas Areny, John G. Webster, *Sensors and Signal Conditioning,* 2nd Edition, John Wiley and Sons, 2000.
2. A. K. Sawhney, *A Course in Electrical and Electronics Measurements and Instrumentation,* Dhanpat Rai and Sons, New Delhi, 1995.

REFERENCE BOOKS:

1. *Sensor Technology Handbook,* Jon Wilson, 2004.
2. Herman K.P. Neubrat, *Instrument Transducers – An Introduction to Their Performance and Design,* Oxford University Press.
3. Doeblin, E.O., *Measurement Systems: Applications and Design,* 4th Edition, TMH, 2003.
4. Bentley J.P., *Principles of Measurement Systems,* Addison Wesley Longman Ltd, 4th Edition, 2003.
5. Patranabis D, *Sensors and Transducers,* 2nd Edition, PHI, 2003.

II B.Tech. II Semester

10BT40401: **ELECTRONIC CIRCUIT ANALYSIS**

(Common to ECE, EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I: Single Stage Amplifiers

Classification of Amplifiers – Distortion in amplifiers, Analysis of CE, CC & CB Configurations with simplified hybrid model, Analysis of CE amplifier with Emitter Resistance and Emitter Follower, Design of single stage RC Coupled Amplifier Using BJT.

UNIT-II: Multi Stage Amplifiers

Analysis of Cascaded RC Coupled BJT Amplifiers, Cascode Amplifier, Darlington Pair, Different Coupling Schemes used in Amplifiers – RC Coupled Amplifier, Direct and Transformer Coupled Amplifiers.

UNIT-III: BJT Frequency Response

Logarithms, Decibels, General Frequency Considerations, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Effect of Coupling and Bypass Capacitors, The Hybrid – π Common Emitter Transistor Model, CE Short Circuit Current Gain, Current Gain with Resistive Load, Single Stage CE Transistor Amplifier Response, Gain – Bandwidth product, Emitter Follower at Higher Frequencies.

UNIT-IV: MOSFET Amplifiers

Basic Concepts, MOSFET Small Signal Model, Common Source Amplifier with Resistive Load, Diode Connected Load and Current Source Load, Source Follower, Common gate stage cascode and folded cascode amplifier and their Frequency Response.

UNIT-V: Feedback Amplifiers

Classification of Amplifiers, Concepts of Feedback, Classification of Feedback Amplifiers, General Characteristics of Negative Feedback Amplifiers, Effect of feedback on Amplifier Characteristics, Voltage Series, Voltage Shunt, Current Series and Current Shunt Feedback Configurations, Illustrative Problems.

UNIT-VI: Oscillators

Conditions for oscillations, RC and LC Type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized Analysis of LC Oscillators, Quartz, Hartley and Colpitts Oscillators, RC-Phase Shift and Wien-Bridge Oscillators.

UNIT-VII: Large Signal Amplifiers

Class A Power Amplifier, Maximum Value of Efficiency of Class-A Amplifier, Transformer Coupled Amplifier, Transformer Coupled Audio Amplifier, Push Pull Amplifier - Complimentary Symmetry, Class - B Power Amplifier, Phase Inverters, Transistor power Dissipation.

UNIT-VIII: Tuned Amplifiers

Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

TEXT BOOKS:

1. Jacob Millman and Christos C. Halkias, *Integrated Electronics,* McGraw-Hill.
2. Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits Theory*, 9th Edition, PE, 2008.
3. David A. Bell, *Electronic Devices and Circuits*, 5th Edition, Oxford University Press.
4. Behzad Razavi, *Design of Analog CMOS Integrated Circuits*, TMS, 2008.

REFERENCE BOOKS:

1. Donald A. Neaman, *Electronic Circuit Analysis and Design*, 3rd Edition, Tata McGraw-Hill, 2007.
2. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7th Edition, PEI, 2009.
3. Sedra/Smith, *Micro Electronic Circuits*, 5th Edition, Oxford University Press, 2009.
4. K. Lal Kishore, *Electronic Circuit Analysis*, BSP, 2004.
5. S. Salivahanan, N.Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2nd Edition, TMH, 2009.

II B.Tech. II Semester

10BT40221: PRINCIPLES OF ELECTRICAL ENGINEERING

(Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : Two Port Networks
Impedance parameters, admittance parameters, hybrid parameters, transmission (ABCD) parameters, conversion of one parameter to another, conditions for reciprocity and symmetry, interconnection of two port networks in series, parallel and cascaded configurations, image parameters, illustrative problems.

UNIT-II : Filters
Classification of filters, filter networks, classification of pass band and stop band, characteristic impedance in the pass band & stop bands, constant-k Low pass filter, high pass filter, m-derived T-section, band pass filter and band elimination filter, illustrative problems.

UNIT-III : Symmetrical Attenuators
Symmetrical attenuators, T- type attenuator, Π- type attenuator, bridged T type attenuator, lattice attenuator.

UNIT-IV : DC Machines
Principle of operation of DC Machines- constructional features, EMF equation, Types of DC machines, Magnetization and load characteristics of DC generators, characteristics of DC motors, losses and efficiency, Swinburne's test, Speed control: flux and armature voltage control of DC shunt motor.

UNIT-V : Poly Phase System
Advantages of poly phase system over single phase system - phase sequence - star & delta connections, relationship between phase and line quantities, balanced and unbalanced circuits, power measurement in three phase systems using two wattmeter method - problems.

UNIT-VI : Transformers and their Performance
Principle of operation of single phase transformer, types, constructional features, phasor diagram on No load and load, equivalent circuit, losses and efficiency of transformer and regulation, OC and SC tests, predetermination of efficiency and regulation (simple problems).

UNIT-VII : Three Phase Induction Motors and Alternators

Principle of operation of three phase induction motors, slip ring and squirrel cage motors, alternators: constructional features, principle of operation, types, EMF equation (simple problems).

UNIT-VIII : Special Machines

Principle of operation - shaded pole motors, capacitor motors, AC servomotor, AC tachometers, synchros, stepper motor - characteristics.

TEXT BOOKS:

1. A. Sudhakar, Shyammohan S. Palli, *Network Analysis,* 3rd Edition, Tata McGraw-Hill, New Delhi, 2009.
2. B.L. Theraja and A.K. Theraja, *A Text Book Electrical Technology*, Vol - 2, S. Chand Company, New Delhi, 2010.

REFERENCE BOOKS:

1. John D. Ryder, *Networks, Lines and Fields*, 2nd Edition, Prentice Hall of India, New Delhi, 2009.
2. C.L. Wadhwa, *Network Analysis and Synthesis*, 3rd Edition, New Age International Publishers, 2007.
3. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering,* Oxford University Press, New Delhi, 2005.
4. W.H. Hayt and J.E. Kemmerly and S.M. Durbin, *Engineering Circuits Analysis*, 6th Edition, Tata McGraw-Hill, New Delhi, 2006.
5. M.S. Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering*, Tata McGraw-Hill, New Delhi, 2008.

II B.Tech. II Semester

10BT40402: **PULSE AND DIGITAL CIRCUITS**

(Common to ECE, EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I: Linear Wave Shaping
High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High pass RC network as differentiator and Low pass RC network as integrator, attenuators and its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit. Problem solving.

UNIT-II: Non-Linear Wave Shaping
Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Synchronized clamping.

UNIT-III: Switching Characteristics of Devices
Diode as a switch, piecewise linear diode characteristics, Diode switching times, Transistor as a switch, Break down voltages, transistor in saturation, temperature variations of saturation parameters, Transistor-switching times, Silicon-controlled-switch circuits.

UNIT-IV: Multivibrator Circuits
Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger Circuit using BJT, Concept of triggering, Symmetrical and asymmetrical configurations.

UNIT-V: Time Base Generators
General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Transistor Current time base generators, Methods of linearity improvements.

UNIT-VI: SAMPLING GATES
Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Four Diode Sampling gate, Reduction of pedestal in gate circuits, Six diode gate, Applications of sampling gates.

UNIT-VII: Synchronization and Frequency Division

Principles of Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit, A Sinusoidal Divider using Regeneration and Modulation.

UNIT-VIII: Realization of Logic Gates using Diodes & Transistors

AND, OR & NOT gates using Diodes & Transistors, DCTL, RTL, DTL, TTL and CMOS Logic families, Comparison between the logic families.

TEXT BOOKS:

1. J. Millman and H. Taub, *Pulse, Digital and Switching Waveforms*, McGraw-Hill, 1991.
2. David A. Bell, *Solid State Pulse Circuits*, 4th Edition, PHI, 2002.
3. Jacob Milliman, Christors C Halkias, *Integrated Electronics,* 1st Edition, TMH, 2004.

REFERENCE BOOKS:

1. A. Anand Kumar, *Pulse and Digital Circuits*, 2nd Edition, PHI, 2005.
2. L. Strauss, *Wave Generation and Shaping*, 5th Edition, TMH, 2010.
3. R.Venkataraman, *Pulse, Digital Circuits and Computer Fundamentals*, 3rd Edition, Dhanapat Rai Publications, 2005.

II B.Tech. II Semester

10BT40231: **ELECTRICAL ENGINEERING LAB**

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

Any SIX experiments from each part to be conducted

PART - A

1. Series and parallel resonance - timing, resonant frequency, bandwidth and Q-factor determination for RLC network
2. Time response of first order RL/RC network for periodic non-sinusoidal inputs - time constant and steady state error determination
3. Two port network parameters - Z and Y parameters
4. Two port network parameters - ABCD and h-parameters
5. Verification of Superposition and Reciprocity theorems
6. Verification of maximum power transfer theorem. Verification on both DC and AC
7. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test
8. Constant - k low pass filter and high pass filter - design and test

PART - B

1. Magnetization characteristics of DC shunt generator. Determination of critical filed resistance
2. Swinburne's test on DC shunt machine (Predetermination of efficiency of a given DC shunt machine working as motor and generator)
3. Brake test on DC shunt motor. Determination of performance characteristics
4. Speed control of DC motor by
   a. Field flux control method
   b. Armature voltage control method
5. OC and SC tests on single-phase transformer (predetermination of efficiency and regulation at given power factors and determination of equivalent circuit)
6. Load test on single phase transformer
7. Brake test on three-phase induction motor. Determination of performance characteristics

II B.Tech. II Semester

10BT40411: **ELECTRONIC CIRCUITS LAB**

(Common to ECE & EIE)

L	T	P	C
-	-	3	2

List of Experiments: (Minimum of Twelve experiments to be conducted)

I) Design and Simulation in Simulation Laboratory using Any Simulation Software.

(Minimum of Six Experiments to be conducted):

1. Common Emitter amplifier
2. Common Source amplifier
3. A Two Stage RC Coupled Amplifier
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. High Frequency Common base (BJT) / Common gate(JFET) Amplifier.

II) Testing in the Hardware Laboratory:

Any Three circuits simulations in Simulation laboratory

Any Three of the following

Class A Power Amplifier (with transformer load)

Class C Power Amplifier

Single Tuned Voltage Amplifier

Hartley and Colpitt's Oscillators

Darlington Pair

MOSFET Amplifier

II B.Tech. II Semester

10BT4HS02: **ADVANCED ENGLISH COMMUNICATION SKILLS**

(Audit Course)

(Common to ECE, EEE, EIE, EConE & BOT)

L	T	P	C
-	3	-	-

UNIt-I: Vocabulary Building

Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.

Functional English: starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

UNIT-II: Reading Comprehension

Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

UNIT-III: Academic Essay Writing

Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

UNIT-IV: Technical Report Writing

Types of formats and styles, Subject-matter, Subject-organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

UNIT-V: Career Skills

Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.

UNIT-VI: Resume Writing

Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

UNIT-VII: Group Discussion

Dynamics of group discussion, Intervention, Summarizing, Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

UNIT-VIII: Interview Skills

Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, *Effective Technical Communication Skills*, Tata McGraw Hill, New Delhi, 2005.
2. Meenakshi Raman and Sangetha Sharma, *Technical Communication, Principles and Practice*, Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, *Secrets of Success in Interviews*, Crucial Books, Secunderabad, 2007.
4. M. Ashraf Rizvi, *Resumes and Interviews - The Art of Wining*, Tata Mc Graw Hill, New Delhi, 2008.
5. Gopala Swamy Ramesh and Mahadevan Ramesh, *The Ace of Soft Skills: Attitude, Communication and Etiquette for Success*, Pearson Education, New Delhi, 2009.

SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.

III B.Tech. I Semester

10BT50421: **ELECTROMAGNETIC THEORY**

(Common to EIE & EConE)

L	T	P	C
4	1	-	4

Review of Coordinate Systems, Vector Calculus.

UNIT-I: Electrostatic Fields

Coulomb's Law, Electric Field Intensity: Fields due to different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations between E and V, Energy Density, Related Problems.

UNIT-II: Electric Fields in Material Space

Properties of Materials, Convection and Conduction Currents, conductors, Relaxation Time, Dielectrics and polarization, boundary conditions, Poisson's and Laplace's Equations; Capacitance: Parallel Plate, Coaxial, Spherical Capacitors, Related Problems.

UNIT-III: Magnetostatics

Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Magnetic Scalar and Vector Potentials, Lorentz force law, Ampere's Force Law, Magnetic Energy, Self and mutual Inductances and Related Problems.

UNIT-IV: Maxwell's Equations (Time Varying Fields)

Faraday's Law and Lenz's law. Continuity Equation, Inconsistency of Ampere's Law, Maxwell's Equations in various forms. Boundary Conditions: Dielectric-Dielectric and Dielectric-Conductor Interfaces, Related Problems.

UNIT-V: EM Wave Characteristics - I

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves: Definition, All Relations Between E & H. Sinusoidal Variations. Wave Propagation in Lossless and Conducting Media. Conductors & Dielectrics: Characterization, Wave Propagation in Good Conductors and Good Dielectrics. Polarization of wave, Related Problems.

UNIT-VI: EM Wave Characteristics - II

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences, for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance. Poynting Vector and Poynting Theorem: Applications, Power Loss in a Plane Conductor. Related Problems.

UNIT-VII: Introduction to EMI

Definition of EMI and EMC, Classification, Natural and man-made EMI sources, Switching transients, Electrostatic Discharge, Nuclear Electromagnetic, Pulse and High Power Electromagnetics.

UNIT-VIII: Introduction to EMC

Grounding- Principles and practice of earthing, precautions in earthing, measurement of ground resistances, system grounding for EMC, cable shielding grounding. Shielding: Theory of effectiveness, materials, integrity at discontinuities, conductive coatings, cable shielding, effectiveness measurements, electrical bonding.

TEXT BOOKS:

1. Matthew N.O. Sadiku, *Elements of Electromagnetics,* 3rd Edition, Oxford Univ. Press, 2001.
2. E.C. Jordan and K.G. Balmain, *Electromagnetic Waves and Radiating Systems,* 2nd Edition, PHI, 2000.
3. Kodali Prasad V, *Engineering Electromagnetic Compatibility*, S Chand, 2000.

REFERENCE BOOKS:

1. William H Hayt Jr, John A. Buck, Engineering Electromagnetics, 7th Edition, TATA Mc Graw Hill, 2006.
2. SA Nasar, Schuams solved problems series, *2000 Solved Problems in Electromagnetics,* Mc Graw Hill, 1992.
3. Christos Christopoulos, *Principles and Techniques of Electromagnetic Compatibility,* 2nd Edition, CRC Press (Taylor & Francis Group), 2007.
4. Clayton R. Paul, *Introduction to Electromagnetic Compatibility,* John Wiley & Sons, 1992.

III B.Tech. I Semester

10BT50422: LINEAR AND DIGITAL IC APPLICATIONS (Common to EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I

Differential Amplifier-Characteristics of OP-Amps, Integrated circuits-Types, Classification, Package Types and temperature ranges, Power supplies, Op-amp Block Diagram, ideal and practical Op-amp specifications, DC and AC characteristics, 741 op-amp & its features, FET input. Op-Amps, Op-Amp parameters & Measurement, Input & Output Offset voltages & currents, slew rates, CMRR, PSRR, drift, Frequency Compensation technique.

UNIT-II: Linear & Non-Linear Applications of Op-Amps

Inverting and Non-inverting amplifier, Integrator and differentiator, Difference amplifier, Instrumentation amplifier, AC amplifier, V to I, I to V converters, Buffers. Non- Linear function generation, Comparators, Multivibrators, Triangular and Square wave generators, Log and Antilog amplifiers, Precision rectifiers.

UNIT-III: Timers & Phase Locked Loops

Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK.

UNIT-IV: CMOS Logic

Introduction to logic families, CMOS logic, CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families.

UNIT-V: Bipolar Logic and Interfacing

Bipolar logic, Transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs – Specifications.

UNIT-VI: The VHDL Hardware Description Language

Design flow, program structure, types and constants, functions and procedures, libraries and packages. Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

UNIT-VII: Combinational Logic Design

Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, Combinational multipliers. VHDL modes for the above ICs.

UNIT-VIII: Sequential Logic Design

Latches and flip-flops, PLDs, counters, shift register, and their VHDL models, synchronous design methodology, impediments to synchronous design.

TEXT BOOKS:

1. Ramakanth A. Gayakwad, *Op-Amps & Linear ICs*, 2nd Edition, PHI, 1987.
2. John F. Wakerly, *Digital Design Principles & Practices,* 3rd Edition, PHI/ Pearson Education Asia, 2005.
3. Charles H. Roth Jr., *Digital System Design Using VHDL*, 1st Edition, Cengage Publications.

REFERENCE BOOKS:

1. James M.Fiore, *Op Amps & Linear Integrated Circuits Concepts & Applications,* Cengage Publications, 2009.
2. D. Roy Chowdhury, *Linear Integrated Circuis*, 2nd Edition, New Age International (p) Ltd, 2003.
3. J. Bhasker, *VHDL Primer*, 3rd Edition, Pearson Education/ PHI, 2007.

III B.Tech. I Semester

10BT40501: COMPUTER ARCHITECTURE AND ORGANIZATION

(Common to ECE, EEE & EIE)

L	T	P	C
4	1	-	4

UNIT-I: Structure of Computers
Computer Types, Functional Units, Basic Operational concepts, Von-Neumann Architecture, Bus Structures, Software, Performance, Multiprocessors and Multicomputers.
Computer Arithmetic: Review of Representation of Information, Addition and Subtraction, Multiplication and Division Algorithms, Floating-Point Arithmetic Operation, Decimal Arithmetic Unit, Decimal Arithmetic operations.

UNIT-II: Register Transfer and Micro-operations
Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit, Instruction Codes, Computer Registers, Computer Instructions, Instruction Cycle, Timing and Control, Memory-Reference Instructions, Input-Output and Interrupt.
Central Processing Unit: Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). Comparison of RISC and CISC.

UNIT-III: Microprogrammed Control
Control Memory, Address Sequencing, Micro-program Example, Design of Control Unit, Hardwired Control, Micro-programmed Control, Nanoprogramming.

UNIT-IV: Pipeline and Vector Processing
Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Data Hazards, Instruction Hazards, Influence on Instruction sets, Data Path & Control Consideration, Superscalar Operations, Vector Processing, Array Processors.

UNIT-V: The Memory System
Basic Concepts, Semiconductor RAM, Types of Read-only Memory (ROM), Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage, and Introduction to Redundant Array of Inexpensive Disks (RAID).
Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA).

UNIT-VI: Input-Output Organization (Advanced)
Input-Output Processor (IOP), Serial communication, Introduction to peripheral component Interconnect (PCI) bus, Introduction to Standard Serial Communication Protocols Like RS232, USB, and IEEE1394.

UNIT-VII: Multiprocessors
Characteristics of Multiprocessors, Interconnection Structures, Interprocessor Arbitration, Interprocessor Communication and Synchronization, Cache Coherance, Shared Memory Multiprocessors.

UNIT-VIII: Case Studies
CISC Architecture-Pentium IV, RISC Architecture-PowerPC.

TEXT BOOKS :

1. M. Moris Mano, *Computer System Architecture*, 3rd Edition, Pearson/PHI, 2008.
2. William Stallings, *Computer Organization and Architecture*, 6th Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, *Computer Organization*, 5th Edition, McGraw Hill, 2002.
2. Andrew S. Tanenbaum, *Structured Computer Organization*, 4th Edition, PHI/Pearson
3. Sivarama P. Dandamudi, *Fundamentals of Computer Organization and Design*, Springer Int. Edition, 2003.
4. John P. Hayes, *Computer Architecture and Organization*, 3rd Edition,Tata McGraw Hill, 1998.

III B.Tech. I Semester

10BT51001: PROCESS CONTROL INSTRUMENTATION

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Process Control
Definitions, elements of process control, process variables, degree of freedom, characteristics of liquid system, gas system and thermal system. Mathematical model of liquid process, gas process, thermal process. Batch process and continuous process, self regulation.

UNIT-II: Basic Control Actions
Characteristics of ON-OFF, proportional, integral, derivative control modes, composite control modes, PD, PI and PID modes, two position control, single speed floating control.

UNIT-III: Controlling Elements
Self operated controllers, pneumatic proportional controllers (displacement and force type), air supply for pneumatic systems, hydraulic controllers, electrical proportional controllers, electronic proportional controllers, theory of automatic controllers circuits.

UNIT-IV: Controller Tuning
Evaluation criteria: 1/4th decay ratio, IAE, ISE, ITAE. Determination of optimum settings for mathematically described process using time response and frequency response.
Tuning Methods: Process reaction curve method, continuous oscillation method, damped oscillation method.

UNIT-V: Final Control Elements
I/P Converter, P/I converter. Pneumatic, electric and hydraulic actuators, Valve positioner.

UNIT-VI: Control Valves
Characteristics of control valves, valve body, valve types: globe, butterfly, diaphragm, ball valves. Control valve sizing, cavitations, flashing.

UNIT-VII: Control Systems With Multiple Loops
Cascade control, feed forward control, ratio control, selective control systems, split range control, adaptive and inferential control

UNIT-VIII: Selected Unit Operations

Mixing, evaporation, drying, heat exchanger, distillation process. Case study of control schemes of binary distillation column.

TEXT BOOKS:

1. Donald P. Eckman, *Automatic Process Control,* Wiley Eastern Ltd., New Delhi, 1993.
2. G.Stephanopoulis, *Chemical Process Control,* PHI, 1990.

REFERENCE BOOKS:

1. Curtis D. Johnson, *Process Control Instrumentation Technology,* 7th Edition, Pearson Education, New Delhi, 2002.
2. F.G Shirskey, *Process Control Systems*, Mc Graw Hill Company.
3. Patranabis, *Principles of Process Control*, TMH, 1981.
4. Peter Harriot, *Process Control*, TMH.

III B.Tech. I Semester

10BT3BS02: **ENVIRONMENTAL SCIENCES**

(Common to EIE, EEE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Environmental Sciences

Definition and concept of the term environment – Various components of environment – Abiotic and biotic – Atmosphere – Hydrosphere – Lithosphere – Biosphere – Inter relationships – Need for public awareness – Role of important national and international individuals and organizations in promoting environmentalism.

UNIT-II: Natural Resources, Conservation and Management

Renewable and Non renewable resources and associated problems – Forests: Deforestation, Causes, effects and remedies – Effects of mining, dams and river valley projects – case studies; Water resources: Water use and over exploitation – Conflicts over water – Large dams – benefits and problems; Food resources : World food problems – Adverse effects of modern agriculture – Fertilizer and pesticide problems; Land resources: Land degradation – Land slides- Soil erosion – desertification- water logging – salinity – Causes, effects and remedies; Mineral resources: Mining – Adverse effects; Energy resources: Growing needs – Renewable and Non renewable resources – Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear energy, Hydrogen fuel and Solar energy - Impact on environment - Sustainable life styles.

UNIT-III: Ecology and Ecosystems

Definitions and concepts – Characteristics of ecosystem – Structural and functional features – Producers, consumers and decomposers and food webs – Types of ecosystems – Forests grassland, desert, crop land, pond, lake, river and marine ecosystems – Energy flow in the ecosystem – Ecological pyramids – Ecological successions.

UNIT-IV: Bio Diversity, Conservation and Management

Introduction – Definition and concept of biodiversity – Value of biodiversity – Role of biodiversity in addressing new millennium challenges – Global, national biodiversity – Hot spots of biodiversity – Threats to biodiversity – Man and wild life conflicts – Remedial measures – Endemic, endangered and extinct species – In-situ and ex-situ conservation of biodiversity.

UNIT-V: Environment Pollution and Control
Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution – Solid waste management – Causes, effects, control and disposal methods – Role of individuals in the prevention of pollution – Hazards and disaster management – Floods – Earthquakes – Tsunamis – Cyclones – Land slides – Case studies.

UNIT-VI: Social Issues and The Environment
Concept of sustainable development – Methods of rainwater harvesting – Watershed management – Waste land reclamation – Green cover – Green power – Green technology – Resettlement and rehabilitation of people and related problems – Case studies – Issues and possible solutions - Greenhouse effect and global warming – Carbon credits – Acid rains – Ozone layer depletion – Causes, effects and remedies – Consumerism and waste production – Environment protection acts – Air act – Water act – Forest conservation act – Wild life protection act – Issues involved in the enforcement.

UNIT-VII: Human Population and Environment
Population growth and its impact on environment – Environmental ethics – Family welfare programmes – Human health: T.B., Cancer, HIV/AIDS – Causes, effects and remedies – Occupational health hazards – Human rights – Important international protocols and conventions on environment.

UNIT-VIII: Field Work/Environmentalist's Diary/Assignments/ Seminars

TEXT BOOKS:
1. Erach Barucha, *Environmental Studies*, 1st Edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies,* 3rd Edition, New Age International Publishers, 2011.

REFERENCE BOOKS:
1. Desh wal, *Environmental Studies,* 2nd Edition, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1st Edition, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies,* 2nd Edition, Tata McGraw-Hill, New Delhi, 2010.

III B.Tech. I Semester

10BT51002: **INDUSTRIAL INSTRUMENTATION**

L	T	P	C
4	1	-	4

UNIT-I: Metrology
Measurement of length, Plainness, Area, Diameter, Roughness, Angle, Comparators, Gauge blocks, Optical Methods of length & distance measurements.

UNIT-II: Torque & Velocity Measurement
Measurement of torque using Strain gauge, Inductive principle, Digital methods and Magnetostrictive transducer. Measurement of velocity using Electromagnetic transducer, Moving magnet type, Moving coil type, Tachogenerator, Stroboscope.

UNIT-III: Pressure Measurement
Basics of pressure measurement, Deadweight gauges & Manometer types, Vibrating cylinder transducers, High & Low pressure measurement, McLeod Gauge, Knudsen gauge, Momentum transfer gauges, Thermal conductivity gauges, Ionization gauges, Dual gauge techniques.

UNIT-IV: Flow Measurement
Head type, Area type, Electromagnetic type, Positive displacement type, Mass flow meter, Ultrasonic type, Vertex Shedding type, Hotwire anemometer type, Laser doppler velocimeter.

UNIT-V: Viscosity & Density Measurement
Viscosity: definition, units, Industrial viscometers, laboratory viscometers. Density: definition, units, Load cell method, Buoyancy method, Air pressure balance method, Gamma ray method, Vibrating probe method.

UNIT-VI: Temperature Measurement
Temperature standards, fixed points, filled-system thermometers, Bimetallic thermometer, Thermocouple: Laws of thermocouple, Cold junction compensation. Measuring circuits, Speed of response, linearization, Resistance thermometer: 3 lead and 4 lead connections, thermistors, IC temperature sensors. Radiation pyrometer, optical pyrometer. Installation, maintenance and calibration of thermometers and thermocouples.

UNIT-VII: Level Measurement
Electrical methods, Resistance type, Capacitance type, Ultrasonic level gauging, float gauge, torque tube, bubbler tube, Slight glass, Displacer.

UNIT-VIII: Other Measurements
Accelerometer of different types, Gyroscopes, Humidity, Sound level meter, Microphones.

TEXT BOOKS:
1. Doeblin, E.O., *Measurement Systems: Applications and Design,* 4th Edition, TMH, 2003.
2. Patranabis D, *Principles of Industrial Instrumentation*, TMH, 1997.

REFERENCE BOOKS:
1. Considine D M, *Process Instruments & Control handbook*, 4th Edition, McGraw Hill International, 1993.
2. RK Jain, *Mechanical & Industrial Measurements*, Khanna Publishers, 1986.
3. Jones EB, *Instrument Technology*, Volume-I, Butterworths, 1981.

III B.Tech. I Semester

10BT50431: **IC & PDC LAB**

(Common to EIE & EConE)

L	T	P	C
-	-	3	2

List of Experiments:

PART – A:

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers & Clampers.
3. Transistor as a switch.
4. Sampling Gates.
5. Study of Logic Gates & Some applications.
6. Study of Flip-Flops & some applications.
7. Schmitt Trigger.
8. UJT Relaxation Oscillator.
9. Bootstrap sweep circuit.

PART – B: (Design Aspects to be Included)

1. Bistable Multivibrator.
2. Monostable Multivibrator.
3. Astable Multivibrator.

III B.Tech. I Semester

10BT51011: **MEASUREMENTS AND TRANSDUCERS LAB**

L	T	P	C
-	-	3	2

Minimum of **12** Experiments to be conducted

1. Measurement of AC parameters (Voltage & Current) using D' Arsonval Galvanometers
2. Conversion of D'Arsonval Galvanometer into ohmmeter (Series & Shunt)
3. Measurement of unknown resistance, inductance and capacitance using bridge circuits
4. Study of Spectrum Analyzer
5. Measurement of resistance, inductance, capacitance and quality factor of the coil using Q meter
6. Calibration and testing of single phase energy meter
7. Linear displacement measurement using LVDT
8. Temperature measurement using RTD
9. Strain measurement using Strain Gauges
10. Angular displacement using Capacitive transducer
11. Transfer characteristics of thermocouple
12. Level measurement using Fibre-optic sensor
13. Pressure measurement using Bourdon tube
14. Study of Piezoelectric Transducer

III B.Tech. II Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

(Common to EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I : Introduction to Managerial Economics and Demand Analysis

Definition, Nature and scope of managerial economics. Demand Analysis: Determinants of demand – Demand Function-Law of demand and its exceptions. Elasticity of demand. Types, Measurement and significance of Elasticity of demand. Demand forecasting and methods of demand forecasting.

UNIT-II : Theory of Production and Cost Analysis

Production Function: Isoquants and isocosts. Input – output relationship. Law of returns, internal and external economies of scale. Cost concepts: opportunity Vs out lay costs, Fixed Vs Variable costs, Explicit Vs implicit costs, out of pocket Vs inputted costs. Break Even Analysis (BEA), Determination of break even point (Simple problems).

UNIT-III : Introduction to Markets and Pricing

Market Structure:Types of Markets. Features of Perfect competition. Monopoly and Monopolistic competition. Price and Output determination in Perfect competition and Monopoly. Pricing: Objectives and policies of Pricing – Sealed bid pricing, Marginal cost pricing, Cost plus pricing, Going rate pricing, Limit Pricing, Market Penetration, Market Skimming, Block pricing, Bundling, Peak load pricing, Cross subsidization,Duel Pricing, Administrated pricing.

UNIT-IV : Business and New Economic Environment

Characteristic features of Business, features and evolution of Sole proprietorship, Partnership, Joint stock Company, New Economic policy 1991.

UNIT-V : Introduction and Principles of Accounting

Accountancy: Introduction – Concepts – Conventions – Accounting Principles - Double Entry Book Keeping, Journal, Ledger, Trail Balance (Simple Problems).

UNIT – VI : Final Accounts.

Introduction to Final Accounts. Trading Account, Profit and Loss Account, and Balance Sheet with simple adjustments (Simple Problems).

UNIT – VII : Capital and Capital Budgeting

Capital: Significance, Types of capital. Capital Budgeting: Nature and scope of capital budgeting. Features and Methods of capital budgeting. Pay Back Period Method, Accounting Rate of Return Method, Internal Rate of Return Method, Net present Value Method and Profitability Index (Simple Problems).

UNIT – VIII : Computerization of Accountancy System

Manual Accounting Vs Computerized Accounting – Advantages and Disadvantages of Computerized Accounting – Using Accounting Software.Tally:Tally features – Company Creation – Account Groups – Group Creation – Ledger Creation.

TEXT BOOKS:

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3rd Edition, Tata MC-Graw Hill, New Delhi, 2007.
2. R. Cauvery, U.K.Sudhanayak, M.Girija and R. Meenakshi, *Managerial Economics,* 1st Edition, S.Chand and Company, New Delhi, 1997.

REFERENCE BOOKS:

1. Ms. Samba Lalita, *Computer Accounting Lab Work*, 1st Edition, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19th Edition Sultan Chand and Sons, New Delhi, 2005.
3. H.Craig Petersen and W.Cris Levis, *Managerial Economics*, 4th Edition, Pearson, 2009.
4. Lipsy and Chrystel, *Economics,* 4th Edition,Oxford University Press, New Delhi, 2008.
5. S.N.Maheswari and S.K.Maheswari, *Financial Accounting,* 4th Edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting,* 5th Edition, Kalyani Publishers, Ludhiana, 2000.

III B.Tech. II Semester

10BT60404: MICROPROCESSORS AND MICROCONTROLLERS

(Common to EEE, ECE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: 8085 Architecture

Microprocessor evolution and types, introduction to 8085 architecture, register organization, pin description, instruction set (briefly), simple programs, interrupts of 8085, interfacing I/O devices using memory mapped I/O and I/O mapped I/O.

UNIT-II: 8086 Architecture

Architecture of 8086 microprocessor, register organization, special functions of general purpose registers, memory segmentation, pin description, minimum and maximum mode operation of 8086, timing diagram.

UNIT-III: 8086 Instruction Set and Assembler Directives

Machine language instruction formats, addressing modes, instruction set of 8086, assembler directives, simple programs - procedures and macros.

UNIT-IV: Programmable Interfacing Devices

Types of data communication, serial and parallel, methods of parallel data transfer, 8255A (programmable peripheral interface) internal block diagram, operational modes and initialization, interface of I/O devices: A/D, D/A, key board, stepper motor.

UNIT-V: Serial Data Communication

Types of serial data transmission, synchronous and asynchronous, 8251 (USART), simple programs for sending and receiving characters with an 8251 (polling & interrupt basis), serial communication standard, RS232C, RS232C to TTL and TTL to RS232C conversion, USB.

UNIT-VI: Interfacing with Advanced Devices

Memory (static RAM and EPROM) and I/O interfacing with 8086, 8257 (DMA controller), interrupt structure, interrupt vector table, 8259 Programmable Interrupt Controller (PIC), importance of cascading of PICs.

UNIT-VII: 8051 Microcontroller

Architecture of 8051 microcontroller, internal and external memories, addressing modes and instruction set of 8051, simple programs using 8051.

UNIT-VIII: 8051 Interrupts, Communication and Applications

Interrupts, timers/counters and serial communication, programming of interrupts, timers/counters and serial communication interrupts. Interfacing LEDs, seven segment display.

TEXT BOOKS:

1. Douglas V.Hall, *Microprocessors and Interfacing: Programming and Hardware,* revised 2nd Edition, Tata McGraw-Hill.
2. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems*, Prentice Hall of India, 2000.

REFERENCE BOOKS:

1. Ramesh S. Goankar, *Microprocessor- Architecture, Programming and Applications with the 8085*, 5th Edition, Penram International Publishing Private Limited.
2. A.K. Ray & K.M.Bhurchandi, A*dvanced Microprocessors and Peripherals- Architecture, Programming and Interfacing,* Tata McGraw-Hill, 2002.
3. Yu-cheng Liu, Glenn A. Gibson, *Microcomputer Systems: The 8086 /8088 Family Architecture, Programming and Design,* Prentice Hall of India, 2006.

III B.Tech. II Semester

10BT60401: **DIGITAL SIGNAL PROCESSING**

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Digital Signal Processing

Discrete-time signals and sequences, Linear shift invariant systems, Stability and Causality, Linear constant coefficient difference equations. Frequency domain representation of discrete-time signals and systems.

UNIT-II: Discrete Fourier Series

DFS representation of periodic sequences, properties of Discrete Fourier Series. Discrete Fourier Transforms: properties of DFT, Linear convolution of sequences using DFT, Computation of DFT. Relation between Z-Transforms and DFS.

UNIT-III: Fast Fourier Transforms

Fast Fourier transforms (FFT): Radix-2 Decimation in time (DIT) and Decimation in frequency (DIF), FFT algorithms, Inverse FFT and FFT for composite N.

UNIT-IV: Realization of Digital Filters

Review of Z-transforms, Applications of Z-Transforms, Solution for difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations. Basic structures of IIR systems, Transposed forms. Basic structures of FIR systems, System function.

UNIT-V: IIR Digital Filters

Introduction to analog and digital filters, Analog filter approximations-Butterworth and chebyshev, Design of IIR digital filters from analog filters, Design examples: analog-digital transformations.

UNIT-VI: FIR Digital Filters

Characteristics of FIR digital filters, Frequency response. Design of FIR digital filters using windowing techniques, Frequency sampling technique, Comparison of IIR and FIR filters.

UNIT-VII: Multirate Digital Signal Processing Fundamentals
Basic sample rate alteration devices, Decimation, Interpolation, Sampling rate conversion, Implementation of sampling rate conversion, Multistage design of decimator and Interpolator.

UNIT-VIII: Applications of Digital Signal Processing
Spectral analysis of nonstationary Signals, Musical sound processing, Signal Compression, Transmultiplexers, Discrete multitone transmission of digital data.

TEXT BOOKS:
1. John G. Proakis, Dimitris G. Manolakis, *Digital Signal Processing, Principles, Algorithms and Applications,* 4th Edition, Pearson Education/PHI, 2007.
2. A.V. Oppenheim and R.W. Schaffer, *Discrete Time Signal Processing,* 2nd Edition, PHI, 2006.
3. Sanjit K Mitra, *Digital Signal Processing, A Computer Base Approach,* 3rd Edition, Tata Mcgraw Hill, 2009.

REFERENCE BOOKS:
1. S Salivahana, A Vallavaraj, C Gnanapriya, *Digital Signal Processing,* TATA McGraw Hill, 2005.
2. Andreas Antoniou, *Digital Signal Processing,* TATA McGraw Hill, 2006.

III B.Tech. II Semester

10BT50423: **PRINCIPLES OF COMMUNICATIONS**

L	T	P	C
4	1	-	4

UNIT-I: Introduction
Block diagram of Electrical Communication System, Radio Communication: Types of Communications, Analog, Pulse and Digital types of Signals, Fourier Transform for various Signals, Fourier Spectrum, Power Spectral Density, Autocorrelation, Cross Correlation, Convolution.

UNIT-II: Amplitude Modulation
Need for Modulation, Types of Amplitude Modulation, AM, DSBSC, SSBSC, Power and BW requirements, generation of AM, DSBSC, SSBSC, demodulation of AM: Diode detector, Product demodulation for DSBSC & SSBSC.

UNIT-III: Angle Modulation
Frequency & Phase Modulations, advantages of FM over AM, Bandwidth consideration, Narrowband and Wideband FM, generation and demodulation of FM, Comparison of FM & PM.

UNIT-IV: Pulse Modulations
Sampling, Nyquist rate of Sampling, Sampling theorem for Band limited Signals, PAM, regeneration of Base band Signal, PWM and PPM, Time Division Multiplexing, Frequency Division Multiplexing, Asynchronous Multiplexing.

UNIT-V: PCM Schemes
Advantages, Block diagram of PCM, Quantization, effect of Quantization, Quantization error, Base band Digital Signal, DM, ADM, ADPCM and Comparison.

UNIT-VI: Digital Modulation
ASK, FSK, PSK, QPSK, DPSK, QAM, Modulation and Demodulation-Coherent and Incoherent, Modems.

UNIT-VII: Information Theory
Concept of Information, Rate of Information and Entropy, Source Coding for optimum rate of Information, Coding efficiency, Shanon-Fano and Huffman Coding.

UNIT-VIII: Error Control Coding
Introduction, Error Detection and Correction Codes, Block Codes, Convolutional Codes.

TEXT BOOKS:

1. Simon Haykin, *Communication Systems,* 2nd Edition, John Wiley Publishers, 2008.
2. R.P. Singh and S D Sapre, *Communication Systems Analog and Digital,* 3rd Edition,TMH, 2006.
3. H. Taub and D. Schilling, *Principles of Communication Systems,* 2nd Edition, TMH, 2003.

REFERENCE BOOKS:

1. Kennedy and Davis, *Electronic Communication Systems,* 4th Edition, TMH, 2004.
2. John. G. Proakis and Masoud Salehi, *Communication Systems Engineering,* 2nd Edition, PHI, 2004.

III B.Tech. II Semester

10BT61001: **OPTOELECTRONIC & LASER INSTRUMENTATION**

L	T	P	C
4	1	-	4

UNIT-I: Optical Fibers

Introduction to optical fibers, Laws of reflection, critical angle, Light guidance, Numerical aperture, Dispersion, Losses, Different types of fibers, Modes of operation and their properties transmission characteristics.

UNIT-II: Components of Optical Fiber

Light Sources for fiber optics, Photo detectors, source coupling, Fiber termination, Splicing and connectors.

UNIT-III: Fiber Optic Sensors

Fiber optic instrumentation system, Interferometer method of measurement of length, Moire fringes, Measurement of pressure, Temperature, Current, Voltage, Liquid level and strain, fiber optic Gyroscope, Polarization maintaining fibers, Applications.

UNIT-IV: Laser Fundamentals

Fundamental characteristics of lasers, Three level and four level lasers, Properties of laser, Laser modes, Resonator configuration, Q-switching and mode locking, Cavity damping, Types of lasers, Gas lasers, solid lasers, liquid lasers, semiconductor lasers.

UNIT-V: Laser Instrumentation

Industrial applications of lasers, Laser heating Material processing, Laser welding, melting and trimming of material, Laser Doppler velocity meter.

UNIT-VI: Medical Applications

Lasers and tissue interaction, Laser instruments for surgery, removal tumors of vocal cords, plastic surgery, dermatology, gynecology and oncology.

UNIT-VII: Holography

Principle, Methods, Holographic Interferometers Holography for non-destructive testing, Holographic components, and applications.

UNIT-VIII: Optoelectronic Modulators
Electro-optic, Magneto-optic and Acousto-optic Modulators.

TEXT BOOKS:
1. Das P., *Lasers and Optical Engineering*, Springers International Students Edition, 1991.
2. A.K. Ghatak, *Optics*, 2nd Edition, TMH, 1992.

REFERENCE BOOKS:
1. Ghatak A.K. and Thyagarajan K, *Optical Electronics*, Foundation Books, 1991.
2. Thyagarajan K. and Ghatak A.K., *Lasers: Theory and Applications*, Plenum Press, 1981.
3. Gerd Keiser, *Optical Fiber Communication,* 3rd Edition, TMH, 2000.

III B.Tech. II Semester

10BT61002: **BIOMEDICAL INSTRUMENTATION**

L	T	P	C
4	1	-	4

UNIT-I:
Components of medical instrumentation system, static and dynamic characteristics of medical instruments, biosignals and characteristics, bioamplifier. Problems encountered with measurements from human beings.

UNIT-II: Electro Physiology
Review of Physiology and anatomy. Structure of cell, sources of bioelectric potentials, resting and action potentials, propagation of action potentials, conduction through nerve to neuromuscular junction.

UNIT-III: Electrode Theory
Electrode-electrolyte interface, electrode-electrolyte skin interface, motion artifacts, external and internal electrodes, biochemical electrodes, transducers for biomedical applications.

UNIT-IV: Cardiovascular Instrumentation
Physiology of cardiovascular system, electrical conduction system of the heart, interpretation of ECG waveform, standard 12-lead configurations, Einthoven triangle, specifications of ECG Machine. Blood pressure, blood flow and heart sound measurements. Relation between electrical and mechanical activities of the heart.

UNIT-V: Neuro-Muscular Instrumentation
Physiology of nervous system, electrode placement for EEG and EMG recording. Specification of EEG and EMG machines Interpretation of EEG and EMG.

UNIT-VI: Therapeutic Equipment
Pacemaker, Defibrillator, cardio vector, Diathermy: Shortwave and microwave. Hemodialysis machine.

UNIT-VII: Respiratory Instrumentation
Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

UNIT-VIII: Medical Imaging System
Radiography, computed radiography, computed tomography, magnetic resonance imaging, ultrasonography.

TEXT BOOKS:
1. Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, *Biomedical Instrumentation and Measurements*, 2nd Edition, PHI, 2009
2. John G. Webster, *Medical Instrumentation, Application and Design,* John Wiley, 2007.

REFERENCE BOOKS:
1. R.S. Khandpur, *Hand-book of Biomedical Instrumentation*, 2nd Edition, TMH, 2007.

III B.Tech. II Semester

10BT60411: **MICROPROCESSORS AND MICROCONTROLLERS LAB**

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

Any **TWELVE** experiments to be conducted

I Programs using 8085

1. Arithmetic operations
2. Logical operations

II Programs using 8086

1. Introduction to MASM/TASM
2. Arithmetic operations
3. Logic operations
4. String operations
5. Modular program: use procedure

III Interfacing Programs with 8086

1. Stepper motor
2. Logic controllers
3. A/D and D/A converter
4. Seven segment display
5. Keyboard interfacing

IV Programs using 8051

1. Arithmetic operations
2. Addition operation using external memory
3. Programs using special instructions like SWAP, bit/byte, set/ reset etc.

III B.Tech. II Semester

10BT61011: **PROCESS CONTROL LAB**

L	T	P	C
-	-	3	2

Minimum **10** experiments should be conducted

1. Response of Interacting and Non-interacting Systems.
2. Servo and regulator operation.
3. Realization of control actions: Pneumatic controllers.
4. Realization of control actions: Electronic controllers.
5. Response of Flow process.
6. Response of Level Process.
7. Response of Temperature Process.s
8. Process tuning - Process reaction curve method.
9. Process tuning - continuous and damped oscillation method.
10. Pneumatic Actuator.
11. Control valve characteristics (ON-OFF & LINEAR).
12. Multi loop control systems - Ratio Control.
13. Multi loop control systems - Cascade Control.

IV B.Tech. I Semester

10BT6HS01: **MANAGEMENT SCIENCE**

(Common to EEE, EIE & EConE)

L	T	P	C
4	-	-	4

UNIT-I: Introduction to Management

Concepts of management and organization - Nature and Importance of management - Evolution of management thought - Functions of management - Contributions of F.W. Taylor and Henri Fayol to the management - Systems approach to management - Managerial skills - Elements of corporate planning process - Environmental scanning - SWOT Analysis - Social responsibilities of management.

UNIT-II: Designing Organizational Structures

Basic concepts related to organization - Departmentation and decentralization - Types of organizations - Merits, demerits and adoptability to modern firms.

UNIT-III: Operations Management

Principles and types of plant layout - Methods of production - Forecasting - Forecasting methods - Work study - Basic procedure involved in method study and work measurement - Statistical quality control: Factors affecting quality - Quality control using control charts (simple problems) - Acceptance sampling.

UNIT-IV: Materials Management

Materials management objectives - Inventory - Types of inventory - Safety stock - Classical EOQ model - Need for inventory control - EOQ simple problems - ABC analysis - Purchase procedure - Stores management.

Marketing: Functions of marketing - Marketing mix - Channels of distribution.

UNIT-V: Human Resourses Management (HRM)

Nature and scope of HRM - HRD and personnel management and industrial relations - Functions of HRM - Role of HR Manager in an organization - Performance appraisal - Job evaluation and merit rating - Motivation - Importance of motivation - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

UNIT-VI: Project Management (PERT/CPM)

Network analysis - Program evaluation and review technique (PERT) - Critical path method (CPM) - Identifying critical path - Probability of completing the project within given time - Project cost analysis - Project crashing (simple problems).

UNIT- VII: Entrepreneurship

Introduction to entrepreneurship - Definition of an entrepreneur - Entrepreneurial traits - Entrepreneur vs. manager - Entrepreneurial decision process - Role of entrepreneurship in economic development - Social responsibilities of entrepreneurs - Opportunities for entrepreneurs in India and abroad - Women as an entrepreneur.

UNIT-VIII: Contemporary Management Practices

Basic concepts of Just-In-Time (JIT) system - Total quality management (TQM) - Value chain analysis - Enterprise resource planning (ERP) - Business process outsourcing (BPO) - Globalization-Management challenges - Intellectual property rights - Supply chain management - Role of information technology in managerial decision making.

TEXT BOOKS:

1. O.P. Khanna, *Industrial Engineering and Management*, Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management*, 6th Edition, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement*, 12th Edition, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6th Edition, TMH, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2nd Edition, TMH, New Delhi.
4. Heinz Weihrich and Harold Koontz, *Management- A Global Perspective*, 10th Edition, McGraw-Hill International.

IV B.Tech. I Semester

10BT71001: **ANALYTICAL INSTRUMENTATION**

L	T	P	C
4	1	-	4

UNIT-I: pH and Conductivity & Dissolved Component Analyzer
Conductivity meters, pH meters, dissolved oxygen analyzer, hydrogen analyzer, sodium analyzer, silica analyzer and sampling systems.

UNIT-II: Gas Analyzers
Thermal conductivity types, CO monitor, NO_x analyzer, H_2S analyzer system and sampling, industrial analyzer circuits, analysis based on ionization of gases, sulphur dioxide, hydro carbons estimation.

UNIT-III: Chromatography
Introduction, basic definitions. Gas chromatography: Principle, detection systems and applications, Liquid chromatography: Principle, types, detection system, and applications.

UNIT-IV: Oxygen Analyzer
Principles of oxygen analyzer, paramagnetic type, magnetic wind type, medical oxygen analyzer, detectors, sampling system.

UNIT-V: Spectrophotometers – I
Special methods of analysis, Beer-Lambert law, colorimeters, UV-VIS spectrophotometers, single and double beam instruments, sources and detectors. IR spectrophotometers and their types.

UNIT-VI: Spectrophotometers – II
FTIR spectrophotometer, flame emission and atomic absorption spectrophotometer, atomic emission spectrophotometer, flame photometers, calorific value measurements.

UNIT-VII: Principle of Nuclear Magnetic Resonance
Instrumentation associated with NMR spectrometer, introduction to mass spectrometer, electron spin resonance principle, X-ray spectrometer principle, X-ray detectors, X-ray diffractometers.

UNIT-VIII: Applications

Nuclear radiation detectors, ionization chamber, GM counter, proportional counter, solid state detectors, gamma detector.

TEXT BOOKS:

1. Khandpur, *Handbook of Analytical Instruments*, 2nd Edition,TMH.
2. Jain R.K., *Mechanical and Industrial Measurements*, 2nd Edition, Khanna Publishing, New Delhi, 1992.

REFERENCE BOOKS:

1. Willard H.H., Merrit L.L., Dean J.A.. and Seattle F.L., *Instrumental Methods of Analysis*, 6th Edition, CBS Publishing and Distributors, 1995.
2. Skoog D.A. and West D.M., *Principles of Instrumental Analysis*, Holt Sounder Publication, Philadelphia, 1985.

IV B.Tech. I Semester

10BT71002: **AUTOMATION OF INDUSTRIAL PROCESSES**

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Computer Control
Role of computers in the control of Industrial processes. Elements of Computer Controlled Process. Classification, Batch Process, Types of Batch process, Continuous, Supervisory and Direct Digital Controls. Architecture, Centralized, Distributed and Hierarchical Systems. Man Machine Interface.

UNIT-II: Building Blocks
Process Control Requirements of Computers. Process related variables. Computer Networks, Communications in Distributed control Systems. Smart Sensors and Field bus.

UNIT-III: Control System Design - I
Control System Design using heuristics and models. Controller Design: Regulator design and other design considerations. Controller Tuning - P, PI, PID, and Ziegler-Nicholas method.

UNIT-IV: Control System Design - II
Computer control loop, Modified Z - Transform, Zero-order hold equivalence, First order system with time delay, Converting continuous time controller to discrete time domain, Design of controllers based on discrete time model: Deadbeat and Dahlin's algorithms.

UNIT-V: Design of Feed Forward Controller
Block Diagram, Feed Forward control algorithms: dynamic, static, deadbeat.

UNIT-VI: Advanced Strategies
Cascade Control: Dynamic response, Types, Implementation, Predictive Control: Model based and Multivariable System, Statistical Process Control. Algorithms for Processes with deadtime: Smith Predictor (SP), Analytical Predictor (AP).

UNIT-VII: Programmable Logic Controllers: Architecture, Basic PLC Programming, Creating Ladder diagrams for Digital Logic gates, Timer/counter functions. Skip and MCR functions, Sequencer functions, Networking of PLCs.

UNIT-VIII: Distributed Control System

Overview of Distributed Control System (DCS). DCS Software configuration, DCS Communication, DCS Supervisory Computer tasks, DCS Integration with PLCs and Computers.

TEXT BOOKS:

1. S.K.Singh, *Computer Aided Process Control,* PHI, 2009.
2. M.Chidambaram, *Computer Control of Processes*, 2nd Edition, Narosa Publications, 2003.

REFERENCE BOOKS:

1. Krishna Kanth, *Computer-based Industrial Control*, PHI, 1997.
2. S.Bennett, *Real Time Control: An Introduction*, 2nd Edition, Pearson Education, 2003.
3. John W.Webb and Ronald A.Reis, *Programmable Logic Controllers-Principles and Applications*, 5th Edition, Pearson Education.

IV B.Tech. I Semester

10BT40502: OBJECT ORIENTED PROGRAMMING
(Common to ECE, EIE, EConE)

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Object Oriented Programming

Need for OOP paradigm, OOP concepts, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions. C++ class overview-class definition, objects, class members, access control, class scope, constructors and destructors, inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

UNIT-II: Polymorphism and Inheritance

Function overloading, operator overloading, generic programming-function and class templates, inheritance basics, base and derived classes, different types of inheritance, base class access control, virtual base class, function overriding, run time polymorphism using virtual functions, abstract classes, Streams.

UNIT-III: Basics of Java

History of Java, Java buzzwords, datatypes, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects- concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT-IV: Inheritance and Interfaces

Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

Interfaces: differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-V: Exceptional Handling
Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.
Exception handling: Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

UNIT-VI: Multithreading and Applets
Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads.
Applets: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets, Graphics class.

UNIT-VII: Event Handling
Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels- scroll pane, dialogs, menubar, graphics, layout manager- boarder, grid, flow, card and grid bag.

UNIT-VIII: SWINGS
Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing, JApplet, JFrame and JComponent, Icons and labels, text fields, The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed panes, Scroll Panes, Trees and Tables.

TEXT BOOKS:

1. Robert Lafore, Waite Group's *Object-Oriented Programming in C++,* 3rd Edition, 2007.
2. Herbert schildt, *Java; The Complete Reference*, 7th Edition, TMH, 2008.

REFERENCES:

1. Y. Daniel Liang, *Introduction to Java Programming*, 6th Edition, Pearson Education.
2. Cay.S.Horstmann and Gary Cornell, *Core Java 2 Fundamentals,* 7th Edition, Vol I, Pearson Education.
3. S.B.Lippman, *C++ primer,* 3rd Edition, Pearson Education.
4. W.Savitch, *Problem Solving with C++, The OOP*, 4th Edition, Pearson Education.
5. B. Stroustrup, T*he C++ Programming Language*, 3rd Edition, Pearson Education.

IV B.Tech. I Semester

10BT71003: **POWER PLANT INSTRUMENTATION**
(ELECTIVE - I)

L	T	P	C
4	-	-	4

UNIT-I: An Overview of Power Generation
Brief survey of methods of power generation: Hydroelectric, Nuclear, Solar, Wind etc. Importance of Instrumentation for power generation, Thermal power plants: Building blocks, PI diagram of Boiler, Cogeneration.

UNIT-II: Parameters and Measurements - I
Instrument Transformers, Measurement of power-one wattmeter method, Reactive power measurement, single phase and three phase electrodynamometer power factor meter, Frequency meters: Mechanical resonance type, electrical resonance type, electrodynamometer type and ratio meter type, Trivector meter.

UNIT-III: Parameters and Measurements - II
Non electrical parameters, flow of feed water, temperature, level radiation detectors, smoke density measurements, dust monitor.

UNIT-IV: Combustion Control in Boilers
Basic building blocks of a boiler, types of boilers, Combustion control, control of Main header Pressure, air fuel ratio control, drum level (three element control), main and reheat steam temperature control.

UNIT-V: Draught and Other Controls
Introduction, Natural draught, mechanical draught control, gas recirculation control, deaerator level control, pulverizer control.

UNIT-VI: Turbine Monitoring and Control
Condenser vaccum control, gland steam exhaust pressure control, Shell temperature monitoring and control, Lubricating oil temperature control, Hydrogen generator cooling system.

UNIT-VII: Analyzers in Power Plants - I
Thermal conductivity type, paramagnetic type oxygen analyzer, infrared type and trim analyzer, hydrogen purity meter.

UNIT-VIII: Analyzers in Power Plants - II
Chromatography, pH meter, Conductivity cell, fuel analyzer, brief survey of pollution monitoring and control equipment.

TEXT BOOKS:
1. *Modern Power Stations Practice, vol. 6, Instrumentation, Controls and Testing*, Pergamon Press, Oxford, 1971.
2. Krishnaswamy & Ponni Bala, *Power Plant Instrumentation*, PHI, 2011.

REFERENCE BOOKS:
1. Elonka S.M., and Kohal A.L., *Standard Boiler Operations,* TMH, 1994.
2. Wakil M.M., *Power Plant Technology*, McGraw Hill, 1984.

IV B.Tech. I Semester

10BT71004: **PETROCHEMICAL PLANT INSTRUMENTATION (ELECTIVE - I)**

L	T	P	C
4	-	-	4

UNIT-I: Petroleum Processing

Petroleum exploration, characteristics of petroleum, chemicals manufacture, sources of refinery gases, applications of refinery gases, raw materials.

UNIT-II: Chemicals from Petroleum Products

Chemicals from petroleum, methane derivatives, acetylene derivatives, ethylene derivatives, propylene derivatives, derivatives of higher olefins.

UNIT-III: Products from Miscellaneous Petroleum Sources

Derivatives of synthesis gas, ammonia-methyl alcohol oxoprocess, fischer-tropsch reaction, carbon monoxide reactions.

UNIT-IV: Overview of Binary Distillation Concepts

Binary equilibrium flash calculations, graphical methods for binary distillation, an analytical method for distillation, other design parameters in distillation.

UNIT-V: Control Loops in Petrochemical Industry

Process control in refinery and petrochemical industry, control of distillation column, control of catalytic crackers and pyrolysis unit, automatic control of polyethylene.

UNIT-VI: Process Identification and Frequency Response

Controller tuning deadtime compensation, Smith and analytical predictors. Feed forward, cascade and parallel cascade control for distillation columns.

UNIT-VII: Dynamic Modeling and Simulation

Pairing and Interaction in distillation, Proper pairing in single and dual composition control, Relative Gain Analysis, Decoupling for non- interacting control.

UNIT-VIII: Inferential Control Schemes for Distillation
Model Algorithmic Control, DMC control strategy, comparison of MAC with classical feedback design. Adaptive control.

TEXT BOOKS:

1. Waddams A.L, *Butter and Chemical from Petroleum*, Janner Ltd., 1968.
2. P.B. Deshpande, *Distillation Dynamics and Control*, ISA, 1985.

REFERENCE BOOKS:

1. Austin G.T.Shreeves, *Chemical Process Industries*, McGraw Hill International Student Edition, Singapore, 1985.
2. Balchan.J.G. and Mumme K.I., Van, *Process Control Structures and Applications,* Nostrand Reinhold Company, New York, 1988.
3. Liptak B.G., *Instrumentation in Process Industries*, Chilton Book Company, 1994.
4. F.G. Shinskey, *Distillation Control*, McGraw Hill, 1977.
5. W.L. MaCabe, J.C.Smith and P. Harriott, *Operations of Chemical Engineering,* 5th Edition, McGraw Hill, 1993.

IV B.Tech. I Semester

10BT71005: **MEMS AND MICROSYSTEMS (ELECTIVE - I)**

L	T	P	C
4	-	-	4

UNIT-I: Overview of MEMS & Microsystems
Basics of MEMS & microsystems, products, evolution of microfabrication, microsystems & microelectronics, miniaturization, microsystem design & manufacture, applications.

UNIT-II: Working Principles of Microsystems
Introduction, microsensors, microactuation, MEMS with microactuators, microaccelerometers, microfluidics.

UNIT-III: Engineering Mechanics for Microsystems Design
Introduction, static bending of thin plates, mechanical vibration, thermomechanics, fracture mechanics.

UNIT-IV: Scaling Laws in Miniaturization
Introduction to scaling, scaling in geometry, rigid body dynamics, electrostatic forces, electromagnetic forces, fluid mechanics, electricity, heat transfer.

UNIT-V: Materials For MEMS & Microsystems
Substrates & wafers, active substrate materials, silicon as a substrate material, silicon compounds, silicon piezoresistors, gallium arsenide, quartz, piezoelectric crystals, polymers, packaging materials.

UNIT-VI: Microsystem Fabrication Processes
Photolithography, ion implantation, diffusion, oxidation, chemical vapor deposition, physical vapor deposition, deposition by epitaxy, etching.

UNIT-VII: Overview of Micromanufacturing & Microsystems Design
Bulk micromanufacturing, surface micromanufacturing, LIGA process, design consideration, process design, mechanical design.

UNIT-VIII: Microsystems Packaging

Overview of mechanical packaging of microelectronics, Microsystem packaging, essential packaging technologies, three-dimensional packaging, signal mapping and transduction, design case: Pressure sensor packaging.

TEXT BOOKS:

1. HSU, TAI RAN, *MEMS and Microsystems Design and Manufacture,* TMH, 2002.

REFERENCE BOOKS:

1. Rai-Choudhury, *MEMS and MOEMS Technology and Applications*, PHI, 2011.

IV B.Tech. I Semester

10BT71006: **VIRTUAL INSTRUMENTATION**
(ELECTIVE - I)

L	T	P	C
4	-	-	4

UNIT-I: Virtual Instrumentation
Historical perspective, advantages, block diagram and architecture of a virtual instrument, data flow techniques, graphical programming in data flow, comparison with conventional programming. Development of Virtual Instrument using GUI, Real-time systems, Embedded Controller, OPC, HMI / SCADA software, Active-X programming.

UNIT-II: VI Programming Techniques
VIS and sub-VIS, loops and charts, arrays, clusters and graphs, case and sequence structures, formula nodes, local and global variables, string and file I/O, Instrument Drivers, Publishing measurement data in the web.

UNIT-III: Basics of Data Acquisition
Introduction to data acquisition on PC, Sampling fundamentals, I/O techniques and buses. ADC, DAC, Digital I/O, counters and timers, DMA, Software and hardware installation, Calibration, Resolution, Data acquisition interface requirements.

UNIT-IV: VI Chassis requirements
Common Instrument Interfaces, Current loop, RS 232C/ RS485, GPIB.

UNIT-V: BUS Interfaces
USB, PCMCIA, VXI, SCSI, PCI, PXI, Firewire. PXI system controllers, Ethernet control of PXI. Networking basics for office & Industrial applications, VISA and IVI.

UNIT-VI: Networking
Networking Basics for office and Industrial applications, VISA and IVI, Distributed I/O modules.

UNIT-VII: Mathematics and Simulation in LabVIEW
Fourier Transforms, power spectrum, correlation methods, windowing & filtering.

UNIT-VIII: VI Applications
Development of Control system, Industrial Communication, Image acquisition and processing, Motion control, LabVIEW based fuzzy logic and genetic algorithm.

TEXT BOOKS:
1. Gary Johnson, *LabVIEW Graphical Programming*, 2nd Edition, McGraw Hill New York, 1997.
2. Lisa K. wells & Jeffrey Travis, *LabVIEW for everyone*, Prentice Hall, New Jersey, 1997.

REFERENCE BOOKS:
1. Kevin James, *PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control,* Newnes, 2000.

IV B.Tech. I Semester

10BT61202: **COMPUTER NETWORKS**
(ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I: Introduction
Network Applications, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Example Network: Novell Networks, X.25, Internet.

UNIT-II: The Physical Layer
Theoretical Basis for communication, Guided Transmission media, Wireless Transmission, The public switched telephone Networks, Mobile telephone system.

UNIT-III: The Data Link Layer
Design Issues, Error detection and correction-CRC, Hamming codes, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols: HDLC, The Data Link Layer in the Internet.

UNIT-IV: The Medium Access Sublayer
Channel Allocations problem, Multiple Access protocols: ALOHA, CSMA, CSMA/CD protocols, Collision free protocols, Limited contention protocols, Ethernet, DLL Switching.

UNIT-V: The Network Layer
Network Layer Design Issues, Routing Algorithms: Shortest path, Flooding, Distance vector, Hierarchical, Broadcast and Multicast, Congestion Control Algorithms, Internetworking. The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, Ipv6 Main Header.

UNIT-VI: The Transport Layer
Transport Service, Elements of transport protocol, Internet Transport layer protocols: UDP and TCP.

UNIT-VII: The Application Layer
DNS: The Domain name system, Electronic Mail, World Wide Web: Architectural Overview, Dynamic Web Document, HTTP.

UNIT-VIII: IEEE Standards and Network Security

Introduction to IEEE standards, Wi-Fi: 802.11b, Bluetooth: 802.15, 3G: 802.16, 4G: 802.16m, Wi-Max: 802.16a.

Introduction to Network Security: Cryptography - Substitution Techniques, Transposition Techniques.

TEXT BOOKS:

1. A.S.Tanenbaum, *Computer Networks*, 4th Edition, Pearson Education/PHI.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, *Data communication and Networking,* TMH, 2004.
2. Peterson and Davie, *Computer Networks*, 2nd Edition, Morgan Kaufmann.
3. Kurose Ross, *Computer Networking*, Pearson Education.
4. Leon-Garcia and Widjaja, *Communication Networks,* 2nd Edition, TMH.
5. S.Keshay, *An Engineering Approach to Computer Networking*, Addison Wesley, 1997.

IV B.Tech. I Semester

10BT71301: **NEURAL NETWORKS AND FUZZY SYSTEMS (ELECTIVE - II)**

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Artificial Neural networks
Introduction, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Types of Neuron Activation Function, ANN Architectures, Supervised, Unsupervised, Reinforced Learning, Potential applications to ANN.

UNIT-II: Feed Forward Networks
Perceptron Models, Learning Rules, Hebbian Learning Rule, Perceptron Learning Rule, Delta Learning Rule, Back propagation: Architecture, Calculation of error, Training algorithm, Applications, Kohenen Self organizing Feature map: Architecture, Training, Learning Vector Quantizer (LVQ).

UNIT-III: Feedback and Counter Propagation Networks
Hopfield network, Architecture, Training algorithm, Application. Full Counter Propagation Network (Full CPN): Architecture, Training Phases of Full CPN, Training Algorithm, Application.

UNIT-IV: Associative Memories
General Concepts of Associative Memory, Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms, Basic architecture BAM Energy Function, Adaptive resonant Theory- ART1-ART2, Architecture, Algorithm, Applications.

UNIT-V: Classical & Fuzzy Sets
Introduction to classical sets, properties, Fuzzy sets, Membership functions, Classical Relations and Fuzzy Relations, Composition.

UNIT-VI: Fuzzy Logic System Components
Properties of Membership Functions, Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification, methods, α-cuts for Fuzzy Relations, Extension principle.

UNIT-VII: Fuzzy Systems

Natural Language, Linguistic Hedges, Fuzzy (Rule-Based) Systems, Graphical Techniques of Inference, Fuzzy Control Systems, Control System Design Problem, Simple Fuzzy Logic Controllers-Examples.

UNIT-VIII: Neural Network and Fuzzy applications

Neural network applications: Load forecasting, Process identification, control and fault diagnosis (Image Processing).

Fuzzy logic applications: Temperature control, Cruise control application, Air conditioner control, DC motor speed control.

TEXT BOOKS:

1. S. Rajasekharan and G. A. Vijayalakshmi pai, *Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications*, PHI Publication, 2004.
2. Timothy J. Ross, *Fuzzy Logic with Engineering Applications*, McGraw-Hill Inc. 1997.

REFERENCE BOOKS:

1. Simon Haykin, *Neural Networks- A Comprehensive Foundation,* Pearson Education, 2001.
2. S.N.Sivanandam, S.Sumathi,S. N. Deepa, *Introduction to Neural Networks using MATLAB 6.0,* TMH, 2006.
3. Philip D.Wasserman, *Neural Computing*, Wiley Publications.

IV B.Tech. I Semester

10BT71007: **TELEMETRY AND TELECONTROL (ELECTIVE - II)**

L	T	P	C
4	1	-	4

UNIT-I: Telemetry Principles

Introduction, Functional blocks of Telemetry system, Methods of Telemetry: Non Electrical, Electrical, Pneumatic, Frequency, Power Line Carrier Communication.

UNIT-II: Symbols and Codes

Bits and Symbols, Time function pulses, Line and Channel Coding, Modulation Codes. Intersymbol Interference.

UNIT-III: Frequency Division Multiplexed Systems

FDM, IRIG Standard, FM and PM Circuits, Receiving end, PLL.

UNIT-IV: Time Division Multiplexed Systems

TDM, PAM, PAM /PM and TDM, PCM Systems. PCM reception. Differential PCM. Introduction to QAM, Protocols.

UNIT-V: Satellite Telemetry

General considerations, TT&C Service, Digital Transmission systems, TT&C Subsystems, Telemetry and Communications.

UNIT-VI: Optical Telemetry

Optical fiber cable, sources and detectors. Transmitter and Receiving Circuits, Coherent Optical Fiber Communication System.

UNIT-VII: Microwave Telemetry

Introduction, microwave spectrum and bands, rectangular Waveguides, microwave transmitter, microwave receiver, Applications of Microwave telemetry.

UNIT-VIII: Telecontrol Methods

Analog and Digital techniques in Telecontrol, Telecontrol apparatus, Remote adjustment, Guidance and regulation, Telecontrol using information theory, Applications of Telecontrol System.

TEXT BOOKS:

1. D. Patranabis, *Telemetry Principles*, TMH.
2. Swoboda G., *Telecontrol Methods and Applications of Telemetry and Remote Control*, Reinhold Publishing Corp., London, 1991.

REFERENCE BOOKS:

1. M. Kulakarni, *Microwave and Radar Engineering*, 9th Edition, Umesh Publications, 1998.
2. Gruenberg L., *Handbook of Telemetry and Remote Control*, McGraw Hill, New York, 1987.
3. Young R.E., *Telemetry Engineering*, Little Books Ltd., London, 1988.
4. Housley T., *Data Communication and Teleprocessing System*, Prentice Hall International, Englewood Cliffs, New Jersey, 1987.

IV B.Tech. I Semester

10BT70402: **DIGITAL IMAGE PROCESSING**

(ELECTIVE - II)

L	T	P	C
4	1	-	4

UNIT-I: Digital Image Fundamentals
Image sensing and acquisition, Image sampling & quantization, some basic relationships between pixels. Mathematical tools used in digital image processing – array Vs matrix operations, linear Vs non linear operations, Arithmetic operations, Set and Logical operations, Spatial operations, vector and matrix operations, Probabilistic methods.

UNIT-II: Image Transforms
2D-DFT and properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar-Transform, Slant Transform, Hotelling Transform.

UNIT-III: Image Enhancement in The Spatial Domain
Basic Intensity transformation functions, Histogram processing, Fundamentals of Spatial Filtering, Smoothing spatial filters, Sharpening spatial filters, Combining spatial Enhancement methods.

UNIT-IV: Image Enhancement in Frequency Domain
Basics of filtering in frequency domain, Correspondence between filtering in the spatial and frequency domains, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters, Homomorphic filtering.

UNIT-V: Image Restoration
Noise models, Restoration in the presence of Noise only-spatial filtering - mean, order- statistic and adaptive filters, Estimating the degradation function, Inverse filtering, Weiner filtering, Constrained least squares filtering.

UNIT-VI: Image Segmentation
Point, line and edge Detection, Thresholding, Region based Segmentation, The use of motion in Segmentation.

UNIT-VII: Image Compression

Need for Image Compression, Classification of redundancy in Images, Image Compression models, Classification of image compression schemes, Run length coding, Arithmetic coding, Block truncation coding, Dictionary based compression, Transform based compression, Image compression standards.

UNIT-VIII: Color Image Processing

Color models, Pseudo color image processing, Color transformations, Smoothing and Sharpening, Image segmentation based on color.

TEXT BOOKS:

1. R. C .Gonzalez & R.E. Woods, *Digital Image Processing,* 2nd Edition, Addison Wesley/Pearson Education, 2002.
2. Malay K. Pakhira, *Digital Image Processing and Pattern Recognition,* PHI, 2011.

REFERENCE BOOKS:

1. Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, *Digital Image Processing using MATLAB,* Tata McGraw Hill, 2010.
2. S jayaraman, S Esakkirajan, T Veerakumar, *Digital Image Processing,* Tata McGraw Hill.
3. A .K. Jain, *Fundamentals of Digital Image Processing,* PHI.

IV B.Tech. I Semester

10BT71011: **ANALYTICAL & BIOMEDICAL INSTRUMENTATION LAB**

L	T	P	C
-	-	3	2

Minimum **10** experiments to be conducted

1. pH measurement.
2. Spectrometer: UV and VIS spectrometer
3. Flame Photometer
4. Geiger Muller Counter
5. Gas chromatography
6. Measurement of calorific value
7. Thermal conductivity detector
8. Blood pressure measurement
9. Measurement of blood flow
10. Study of ECG
11. Design of Instrumentation Amplifier for bioelectrical Signals
12. Measurement of Respiration rate
13. Measurement of heart sounds

IV B.Tech. I Semester

10BT71012: **PLC AND LABVIEW PROGRAMMING LAB**

L	T	P	C
-	-	3	2

Minimum **10** experiments to be conducted

Part A: PLC

1. Implementation of Logic gates, timer and counters.
2. Level control.
3. Pressure control.
4. Motor speed control.
5. Bottle filling system.
6. Temperature control.

Part B: LabVIEW

1. Study of functional blocks.
2. Experiments using Boolean and numeric functional blocks.
3. Experiments using string and array functional blocks.
4. Convert Centigrade to Fahreinheat.
5. Creation of Sub VI.
6. Analyzing and logging of data.
7. Cluster and Error handling.

IV B.Tech. I Semester

10BT7HS01: PROFESSIONAL ETHICS

(Audit Course)

(Common to ECE, EEE, EIE, EConE, CSE, IT & CSSE)

L	T	P	C
2	-	-	-

UNIT-I: Engineering Ethics

Scope and aims of engineering ethics-Senses of Engineering Ethics-Variety of Moral Issues-Types of Inquiry- Moral Dilemmas- Moral Autonomy- Kohlberg's Theory, Gilligan's theory, Consensus and Controversy.

UNIT-II: Professional Ideals and Virtues

Theories about virtues, professional responsibility, integrity, self-respect, sense of "responsibility". Self-Interest, Customs and Religion- Self-interest and ethical egoism, customs and ethical relativism, religion and divine command ethics. Use of ethical theories- resolving moral dilemmas and Moral leadership.

UNIT-III: Engineering as Social Experimentation

Engineering as experimentation- similarities to standard experiments, learning from the past and knowledge gained. Engineering as Responsible experiments-Conscientiousness. Moral autonomy and accountability, the challenger case.

UNIT-IV: Responsibilities and Rights

Collegiality and Loyalty, Respect for authority, collective bargaining, confidentiality, conflict of interests, occupational crime. Rights of Engineers- Professional rights, whistle-blowing, The bart case, employee rights and discrimination.

UNIT-V: Global Issues

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Managers, Consultants and Leaders. Engineers as managers - Managerial ethics applied to engineering profession.

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, *Ethics in Engineering,* 3rd Edition, TMH, 2007.
2. Govindarajan.M, Nata Govindarajan.M, Natarajan.S, Senthilkumar. V.S, *Engineering Ethics*, PHI, 2004.

REFERENCE BOOKS:

1. Dr. S. Kannan, K. Srilakshmi, *Human Values and Professional Ethics*, Taxmann Allied Services Pvt Ltd., 2009.
2. Edmund G seebauer and Robert L Barry, *Fundamental of Ethics for Scientists and Engineers*, Oxford University Press, Oxford, 2001.
3. Charles F Fledderman, *Engineering Ethics*, Pearson education/ Prentice Hall, NewJercy, 2004, (Indian reprint).

IV B.Tech. II Semester

10BT81001: **INDUSTRIAL ELECTRONICS**
(Common to EIE & EConE)

L	T	P	C
4	1	-	4

UNIT-I: DC Amplifiers

Need for DC amplifiers, DC amplifiers: drift, causes, compensation techniques, darlington emitter follower, cascode amplifier, stabilization, chopper stabilization.

UNIT-II: Regulated Power Supplies

Design of series and shunt voltage regulators, protection techniques, switching mode voltage regulators, servo voltage stabilizer, monolithic voltage regulators.

UNIT-III: Silicon Controlled Rectifier

Principle of operation, characteristics of SCR, methods of turn on and turn off mechanism, gate characteristics, triggering modes of SCR: R, RL, RC.

UNIT-IV: Applications of SCR in Power Control

Static circuit breaker, protection of SCR, inverters: classification, single phase inverters, converters: single phase half wave and full wave.

UNIT-V: DIAC, TRIAC and SCR Applications

Chopper circuits, principle, methods and configurations, Cycloconverters, Single phase and Three phase, DIAC, TRIAC.

UNIT-VI: Numeric Control

Basic concept of numerical control, driving devices, hydraulic systems, DC motors, stepping motors, data processing unit characteristics of N/C system, CNC / DNC - CNC typical system, block diagram, interfacing of CNC Machines, adaptive control systems.

UNIT-VII: Industrial Applications - I

Industrial Timers: classification, types, electronic timers: classification, RC and digital timers, time base generators, electric welding: classification, types and methods of resistance and arc welding.

UNIT-VIII: Industrial Applications - II

High frequency heating: principle, merits, applications, high frequency source for induction heating, dielectric heating: principle, material properties, electrodes and their coupling to RF generator, thermal losses and applications. Ultrasonics: generation and applications.

TEXT BOOKS:

1. G K Mithal and Dr Maneesh Gupta, *Industrial and Power Electronics,* 19th Edition, Khanna Publications, 2003.
2. Yoram Korean and Joseph Ben, *Numerical Control of Machine tools*, Khanna Publishers, New Delhi, 1998**.**

REFERENCE BOOKS:

1. D Roy Chowduary, *Linear Integrated Circuits*, 2nd Edition, New age International (p) Ltd, 2003.

IV B.Tech. II Semester

10BT60405: **VLSI DESIGN**

(Elective-III)

L	T	P	C
4	1	-	4

UNIT-I: Introduction
Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT-II: Basic Electrical Properties
Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit ; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT-III: VLSI Circuit Design Processes
VLSI design flow, MOS layers, Stick diagrams, Design rules and Layout, 2 m CMOS design rules for Wires, Contacts and Transistors, Layout diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

UNIT-IV: Gate Level Design
Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations - Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT-V: Subsystem Design
Adders – Transmission based Adder, Carry Bypass Adder, Carry Skip Adder, Carry Select Adder, Shifters- Barrel Shifter, Logarithmic Shifter, Multipliers – Definitions, Array Multiplier, Carry Save multiplier, Booth Multiplier, ALUs, Parity generators, Comparators, Zero/One Detectors, Counters- Synchronous & Asynchronous Counter, High Density Memory Elements.

UNIT-VI: Semiconductor Integrated Circuit Design
PLAs, FPGAs, CPLDs, PALs, Cell based Design Methodology, Design Approach.

UNIT-VII: VHDL Synthesis
VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Types of Simulation, Layout Synthesis, Design capture tools, Design Verification Tools.

UNIT-VIII: CMOS Testing
CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, *Essentials of VLSI Circuits and Systems,* PHI, 2005 Edition.
2. Weste and EShraghian, *Principles of CMOS VLSI Design,* Pearson Education, 1999.

REFERENCE BOOKS:

1. John M. Rabaey, *Digital Integrated Circuits: A Design Perspective,* 2nd Edition, PHI, EEE, 1997.
2. Wayne wolf, *Modern VLSI Design,* 3rd Edition, Pearson Education, 1997.
3. Charles H. Roth, *Fundamentals of Logic Design,* 5th Edition, Thomson Publications, 2004.

IV B.Tech. II Semester

10BT70521: **OPERATING SYSTEM PRINCIPLES (ELECTIVE - III)**

L	T	P	C
4	1	-	4

UNIT-I: Operating Systems Overview
What Operating Systems do, operating systems operations, process management, memory management, storage management, protection and security, distributed systems, special purpose systems, Operating Systems Structures: operating system services and systems calls.

UNIT-II: Process Management
Process concepts and scheduling operations on processes, threads and inter process communication, scheduling criteria, scheduling algorithms.

UNIT-III: Concurrency and Synchronization
Process synchronization, critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors.

UNIT-IV: Deadlocks
System model, deadlock characterization, methods for handling deadlock, deadlock prevention, detection and avoidance, recovery form deadlock, Bankers algorithm.

UNIT-V: Memory Management
Logical versus physical address space, Swapping, contiguous memory allocation, paging, segmentation, demand paging, performance of demand paging, page-replacement algorithms, Thrashing.

UNIT-VI: File System
File System Interface: Concept of a file, Access Methods, Directory structure, File system mounting, File sharing, protection.
File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management.

UNIT-VII: I/O System

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling algorithms, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

UNIT-VIII: Security

The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks.

TEXT BOOK:

1. Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, *Operating System Principles*, 7th Edition, John Wiley.

REFERENCE BOOKS:

1. Stallings, *Operating Systems: Internals and Design Principles,* 5th Edition, Pearson Education, 2008.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition, PHI.
3. Crowley, *Operating System A Design Approach*, 2nd Edition, TMH.
4. Dhamdhere, *Operating Systems,* TMH, 2006.

IV B.Tech. II Semester
10BT70405: EMBEDDED AND REALTIME SYSTEMS
(Elective - III)

L	T	P	C
4	1	-	4

UNIT-I: Introduction
Embedded systems overview, classification, applications, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

UNIT-II: General Purpose Processors
Basic architeicture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Microcontrollers and Digital Signal Processors.

UNIT-III: State Machine and Concurrent Process Models
Introduction, models versus languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT-IV: Communication Interface
Need for communication interfaces, RS232 / UART, RS422 / RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, I^2C bus and CAN.

UNIT-V: Embedded/RTOS Concepts–I
Architecture of the Kernel, Tasks and Task scheduler, Types of real-time tasks, Task periodicity, Task scheduling, Classification of scheduling algorithms, Clock driven Scheduling, Event driven Scheduling, resource sharing, Commercial RTOs.

UNIT-VI: Embedded/RTOS Concepts–II
Interrupt service routines, Semaphores, Mutex, Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority inversion problem.

UNIT-VII: Target Architectures

Host and target machines, linkers, loading software into target machine, debugging techniques, ARM microcontroller, ARM pipeline, Instruction set architecture, THUMB instructions, Exceptions in ARM, salient features of SHARC microcontroller and comparison with ARM microcontroller.

UNIT-VIII: Design Technology

Introduction, Automation, Synthesis, Parallel evolution of compilation and synthesis, Logic Synthesis, RT synthesis, Behavioral Synthesis, Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation, Reuse of intellectual property codes.

TEXT BOOKS:

1. Frank Vahid, Tony D. Givargis, *Embedded System Design – A Unified Hardware/Software Introduction,* John Wiley, 2002.
2. KVKK Prasad, *Embedded/Real Time Systems,* Dreamtech Press, 2005.
3. Santanu Chattopadyay, *Embedded System Design,* PHI, 2010.

REFERENCE BOOKS:

1. Jonathan W. Valvano, Brooks/Cole, *Embedded Microcomputer Systems,* Thompson Learning, 2002.
2. David E. Simon, *An Embedded Software Primer,* Pearson Education, 2005.
3. Sri Ram VIyer, Pankaj Gupta, *Embedded Real Time Systems Programming,* TMH, 2004.

IV B.Tech. II Semester

10BT70421: **ADVANCED MICROPROCESSORS AND MICROCONTROLLERS**
(Elective - III)

L	T	P	C
4	1	-	4

UNIT-I: The 80286 Microprocessors
Architecture, Register Organization, Addressing Modes and over view on instruction set of 80286.

UNIT-II: The 80386 and 80486 Microprocessors
Architectural features, Register Organization, Memory management, Virtual 8086 mode, The Memory Paging Mechanism.

UNIT-III: The Pentium and Pentiumpro Processors
The Memory System, Input/output system, Branch Prediction Logic, Cache Structure, Pentium Registers, Serial Pentium pro features.

UNIT-IV: The Pentium IV and Dualcore Microprocessors
Architecture, Special Registers and Pin Structures (brief treatment only)

UNIT-V: Overview of Architecture and Microcontroller Resources
Architecture of a typical micro controller – Microcontroller resources – Resources in advanced and next generation microcontrollers.
8051 microcontroller – Internal and External memories – Counters and Timers – Synchronous serial-cum asynchronous serial communication - Interrupts.

UNIT-VI: 8051 Family Microcontrollers Instruction Set
Basic assembly language programming – Data transfer instructions – Data and Bit-manipulation instructions – Arithmetic instructions – Instructions for Logical operations on the test among the Registers, Internal RAM, and SFRs– Program flow control instructions – Interrupt control flow.

UNIT-VII: Real Time Control

INTERRUPTS: Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-mask able interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051.

TIMERS: Programmable Timers in the MCU's – Free running counter and real time control – Interrupt interval and density constraints.

UNIT-VIII: 16/32 Bit Microcontrollers

16 bit Microcontrollers: Hardware – Memory map in Intel 80196 family MCU system – IO ports – Programmable Timers and High-speed outputs and input captures – Interrupts

ARM 32 Bit Microcontrollers: Introduction to 16/32 Bit processors – ARM architecture and organization – ARM / Thumb programming model – ARM / Thumb instruction set

TEXT BOOKS:

1. Barry B. Brey, *The Intel Microprocessors,* 8th Edition, Pearson Education, 2009.
2. A.K.Ray and K.M.Bhurchandi, *Advanced Microprocessor and Peripherals,* TMH, 2000.
3. Raj Kamal, *Microcontrollers Architecture, Programming, Interfacing and System Design,* Pearson Education, 2005.
4. Mazidi and Mazidi, *The 8051 Microcontroller and Embedded Systems,* PHI, 2000.

REFERENCE BOOKS:

1. YU-Chang, Glenn A. Gibson, *Micro Computer Systems: The 8086/ 8088 Family Architecture, Programming and Design,* 2nd Edition, Pearson Education, 2007.
2. Douglas V. Hall, *Microprocessors and Interfacing,* Special Indian Edition, 2006.
3. A.V. Deshmuk, *Microcontrollers (Theory & Applications),* WTMH, 2005.
4. John B. Peatman, *Design with PIC Microcontrollers,* Pearson Education, 2005.

IV B.Tech. II Semester

10BT4EC01: **OPTIMIZATION TECHNIQUES**
(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I: Introduction to Optimization Techniques
Statement of an Optimization problem, design vector, design constraints, constraint surface, objective function, objective function surfaces, classification of Optimization problems.

UNIT-II: Classical Optimization Techniques
Single variable Optimization, multi variable Optimization without constraints, necessary and sufficient conditions for minimum/ maximum, multivariable Optimization with equality constraints, Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn - Tucker conditions.

UNIT-III: Introduction to Linear Programming
Standard form of a linear programming problem, geometry of linear programming problems, definitions and theorems, solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations, motivation to the simplex method, simplex algorithm, big M-method, dual simplex algorithm.

UNIT-IV: Transportation Problem and Convex Programming
Finding initial basic feasible solution by North-West corner rule, least cost method and Vogel's approximation method, Assignment problems, variants, Integer Programming, Branch and bound technique, Convex programming.

UNIT-V: Unconstrained Nonlinear Programming
One-dimensional minimization methods: Classification, Fibonacci method, Problems and Quadratic interpolation method, Problems.

UNIT-VI: Unconstrained Optimization Techniques
Univariate method, Problems, Powell's Method, Conjugate directions, Algorithms, Problems, Steepest Descent (Cauchy) Method, Problems.

UNIT-VII: Constrained Nonlinear Programming
Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods.

UNIT-VIII: Dynamic Programming
Dynamic programming, multistage decision processes, types, concept of sub optimization and the principle of optimality, computational procedure in dynamic programming, examples illustrating the calculus method of solution, examples illustrating the tabular method of solution.

TEXT BOOKS:
1. S. S.Rao, *Engineering optimization: Theory and Practice*, 3rd Edition, New Age International (P) Limited, 1998.
2. Dr. S.D. Sharma, *Operations Research*, Kedarnath Ram Nath and Co. Publications, Meerut.

REFERENCE BOOKS:
1. H.A. Taha, *Operations Research: An Introduction*, 6th Edition, PHI.
2. Kanthi Swaroop, Gupta and Mohan, *Introduction to Operations Research,* 2006.

IV B.Tech. II Semester

10BT61302: **ROBOTICS AND AUTOMATION**
(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I: Fundamentals of Manufacturing and Automation
Automation, Types of Automation, Arguments for and against automating, manufacturing industries, manufacturing functions and automation strategies, fundamentals of CAD/CAM.

UNIT-II: Introduction to Robotics
Human factors in automated factories, An overview of Robotics, Laws of robotics, Industrial Robotics - classification by coordinate system and control system, Electronic and Pneumatic manipulators, Present and Future applications.

UNIT-III: Power Sources and Sensors
Hydraulic, Pneumatic and electric drivers, Motor HP determination and gearing ratio, variable speed arrangements, Path Determination, Machinery Vision, Ranging, Laser, Acoustic, Magnetic Fiber Optic and Tactile Sensor.

UNIT-IV: Actuators and Grippers
Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits, End Effecter, Various types of Grippers, Design consideration.

UNIT-V: Kinematics and Dynamics
Differential transformation and manipulators, Jacobians-problems. Dynamics : Lagrange-Euler and Newton-Euler formations-Problems, Forward and Inverse Kinematics Problems, Solutions of Inverse Kinematic problems, Multiple Solution, Jacobian Work Envelop.

UNIT-VI: Robot Programming
Robot programming- Lead through methods, textual robot languages, position specification, motion interpolation, Basic programming languages.

UNIT-VII: Flexible Manufacturing Systems and Automated Material Handling

Automated material handling and storage systems, conveyor systems and automated guided vehicle systems, FMS workstations, applications and benefits.

UNIT-VIII: Robot Applications in Manufacturing

Multiple Robots, Artificial intelligence and Robotics, Robots in Manufacturing and Non-Manufacturing applications – Robot Cell Design and control.

TEXT BOOKS:

1. Groover, M.P., Mitchell Weiss, Nagel,R.N., Nicholas G.Odrey, *Industrial Robotics Technology,* Programming and Applications, McGraw Hill International Edition, 1986.
2. S. R. Deb, *Robotics Technology and Flexible Automation*, TMH.

REFERENCE BOOKS:

1. R. K. Mittal, I. J. Nagrath, *Robotics and Control*, TMH, 2003.
2. R.D.Klafter, T.A. Chimielewski and M.Negin, *Robotic Engineering An Integrated Approach* , PHI, 1989.
3. K. S. Fu., R. C. Gonzalez, C. S. G. Lee, *International Edition, Robotics: Control Sensing,* Vision and Intelligence, McGraw Hill Company.
4. Mikell P. Grower. Automation, *Production Systems and CIM,* PHI, 1987.
5. Jhon J Craig, *Introduction to Robotics Mechanics and Control,* 2nd Edition, Pearson Education.

IV B.Tech. II Semester

10BT81302: **ADAPTIVE CONTROL SYSTEMS**
(ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I: Introduction

Concept of adaptive control, definitions, types of adaptivity, effects of process variation, adaptive systems, adaptive control problem, learning in adaptive systems.

UNIT-II: Real Time Parameter Estimation

Introduction to parameter estimation, least squares and regression models, least squares estimation, recursive computation, continuous time models. Estimation parameters in dynamical systems, finite impulse response models, transfer function models. Experimental conditions.

UNIT-III: Deterministic Self Tuning Regulators

Introduction, block diagram, pole placement design, indirect self tuning regulators, continuous time self tuners, direct self tuning regulators.

UNIT-IV: Stochastic Self Tuning Regulators

Design of minimum variance and moving average controllers - minimum variance control, non-minimum phase system, moving average controller, LQG control, stochastic self tuning regulators, unification of direct self tuning regulators, linear quadratic STR.

UNIT-V: Stability Analysis

Introduction to stability, definitions, theorems, lyapunov theory on stability, bounded input - bounded output stability.

UNIT-VI: Model Reference Adaptive Systems

Introduction - The MIT rules, Determination of Adaptation Gain, Design of MRAS using Lyapunov Theory, Output Feedback, Relations between MRAS and STR.

UNIT-VII: Auto-Tuning
Introduction, PID control, auto-tuning techniques, transient response methods, methods based on relay feedback, relay oscillations.

UNIT-VIII: Gain Scheduling
Introduction, principle, design of gain, scheduling controllers, nonlinear transformations, applications, ship steering, pH control

TEXT BOOKS:
1. Karl.J.Astrom and Bjorn Wittenmark, *Adaptive Control,* Pearson Education, 2003.

REFERENCE BOOKS:
1**.** Misthkin and Braun, *Adaptive Control Systems*, McGraw Hill.

IV B.Tech. II Semester

10BT51301: ADVANCED CONTROL SYSTEMS (ELECTIVE - IV)

L	T	P	C
4	1	-	4

UNIT-I: State Space Analysis

State Space Representation using phase variables, Solution of State Equation, State Transition Matrix, Diagonalization, Canonical Forms, Controllable Canonical Form, Observable Canonical Form, Jordan Canonical Form.

UNIT-II: Controllability and Observability

Tests for controllability and observability for continuous time systems, Necessary and sufficient conditions for controllability and observability, Principle of Duality, Controllability and observability form, Jordan canonical form and other canonical forms.

UNIT-III: Describing Function Analysis

Introduction to nonlinear systems, Different physical nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT-IV: Phase-Plane Analysis

Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase-plane analysis of nonlinear control systems, Delta method.

UNIT-V: Stability Analysis

Stability in the sense of Lyapunov, Lyapunov's stability and Lyapunov's instability theorems, Graphical representation, Sylvester principle, Definiteness, Direct method of Lyapunov for the Linear and Nonlinear continuous time autonomous systems.

UNIT-VI: Modal Control

Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.

UNIT-VII: Optimal Control

Formulation of optimal control problem. Minimum time, Minimum energy, minimum fuel problems, State regulator problem, Output regulator problem, Tracking problem, Continuous-Time Linear Regulators.

UNIT-VIII: Calculus of Variations

Minimization of functionals of single function, Euler Lagrange Equation, Constrained minimization, Minimum principle, Control variable inequality constraints, Control and state variable inequality constraints.

TEXT BOOKS:

1. M. Gopal, *Modern Control System Theory*, 2nd Edition, New Age International Publishers, 1996.
2. A.Nagoor kani, *Advanced Control Theory*, 2nd Edition, RBA Publications, 2009.

REFERENCE BOOKS:

1. K. Ogata, *Modern Control Engineering*, 3rd Edition, Prentice Hall of India, 1998.
2. I.J. Nagarath and M.Gopal, *Control Systems Engineering,* New Age International (P) Ltd.
3. A. Ananda Kumar, *Control Systems,* PHI, 2007.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2010-2011)

I Year B.Tech. (Yearly Pattern)

CIVIL ENGINEERING

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT10101	Engineering Mechanics	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer Programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer Programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics & Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language & Communication Skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering & IT Workshop	-	-	3	4	25	50	75
	TOTAL	15	6	15	**50**	305	670	**975**
		36						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet - 517 102.

COURSE STRUCTURE : II B.Tech., I Semester

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT3BS04	Matrices and Numerical Methods	4	1	-	4	30	70	100
10BT30101	Mechanics of Solids	4	1	-	4	30	70	100
10BT30102	Building Materials and Concrete Technology	4	-	-	4	30	70	100
10BT30103	Basics of Electrical and Mechanical Technology	4	-	-	4	30	70	100
10BT30104	Surveying	4	1	-	4	30	70	100
10BT30105	Fluid Mechanics - I	4	1	-	4	30	70	100
10BT30111	Surveying Lab – I	-	-	3	2	25	50	75
10BT30112	Strength of Materials Lab	-	-	3	2	25	50	75
	TOTAL	24	4	6	**28**	230	520	**750**
		34						

COURSE STRUCTURE : II B.Tech., II Semester

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT3BS01	Probability and Statistics	4	1	-	4	30	70	100
10BT40101	Structural Analysis - I	4	1	-	4	30	70	100
10BT40102	Fluid Mechanics - II	4	1	-	4	30	70	100
10BT40103	Reinforced Cement Concrete Structures - I	4	1	-	4	30	70	100
10BT40104	Construction, Planning and Project Management	4	-	-	4	30	70	100
10BT3BS02	Environmental Sciences	4	-	-	4	30	70	100
10BT40111	Surveying Lab - II	-	-	3	2	25	50	75
10BT40112	Fluid Mechanics and Hydraulic Machinery Lab	-	-	3	2	25	50	75
	TOTAL	24	4	6	**28**	230	520	**750**
		34						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet - 517 102.

COURSE STRUCTURE : III B.Tech., I Semester

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT4HS01	Managerial Economics and Principles of Accountancy	4	-	-	4	30	70	100
10BT50101	Structural Analysis – II	4	1	-	4	30	70	100
10BT50102	Reinforced Cement Concrete Structures – II	4	1	-	4	30	70	100
10BT50103	Engineering Hydrology	4	-	-	4	30	70	100
10BT50104	Soil Mechanics	4	-	-	4	30	70	100
10BT50105	Engineering Geology	4	-	-	4	30	70	100
10BT50111	Computer Aided Building Drawing	-	-	3	2	25	50	75
10BT50112	Engineering Geology Lab	-	-	3	2	25	50	75
10BT4HS02	Advanced English Communication Skills*	-	3	-	-	-	-	-
	TOTAL	24	5	6	**28**	230	520	**750**
		35						

*Audit Course

COURSE STRUCTURE : III B.Tech., II Semester

SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
	L	T	P		Internal Marks	Externa l Marks	Total
ɪtimation and Quantity Surveying	4	-	-	4	30	70	100
eel Structures - I	4	1	-	4	30	70	100
ater Resources Engineering	4	1	-	4	30	70	100
ıvironmental Engineering - I	4	-	-	4	30	70	100
ansportation Engineering	4	-	-	4	30	70	100
ıundation Engineering	4	-	-	4	30	70	100
eotechnical Engineering Lab	-	-	3	2	25	50	75
ıvironmental Engineering Lab	-	-	3	2	25	50	75
ɨminar	-	-	-	2	75	-	75
ɔread Sheet Applications in Civil ıgineering*	-	3	-	-	-	-	-
TOTAL	24	5	6	30	305	520	**825**
	35						

* Audit Course

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet - 517 102.

COURSE STRUCTURE : IV B.Tech., I Semester

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT70101	Remote Sensing and GIS	4	-	-	4	30	70	100
10BT70102	Environmental Engineering - II	4	-	-	4	30	70	100
10BT70103	Steel Structures - II	4	1	-	4	30	70	100
10BT70104	Traffic Engineering and Management	4	-	-	4	30	70	100
	ELECTIVE - I	4	1	-	4	30	70	100
10BT70105	Advanced Structural Analysis							
10BT70106	Soil Dynamics and Machine Foundations							
10BT70107	Design and Drawing of Irrigation Structures							
10BT70108	Environmental Impact Assessment and Management							
10BT70109	Design of Bridges							
	ELECTIVE - II	4	1	-	4	30	70	100
10BT70110	Industrial Structures							
10BT70111	Ground Improvement Techniques							
10BT70112	Water Resources System Planning and Management							
10BT70113	Air Pollution and Control							
10BT70114	Transportation Planning and Pavement Design							
10BT70115	GIS and Computer Aided Design and Detailing Lab	-	-	3	2	25	50	75
10BT70116	Concrete and Highway Engineering Lab	-	-	3	2	25	50	75
10BT70117	Mini Project	-	-	-	2	25	50	75
	TOTAL	24	3	6	**30**	255	570	**825**
		33						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet - 517 102.

COURSE STRUCTURE : IV B.Tech., II Semester

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT6HS01	Management Science	4	-	-	4	30	70	100
	ELECTIVE – III	4	1	-	4	30	70	100
10BT80101	Earthquake Resistant Design							
10BT80102	Advanced Foundation Engineering							
10BT80103	Watershed Management							
10BT80104	Environmental Sanitation							
10BT80105	Architecture and Town Planning							
	ELECTIVE – IV	4	1	-	4	30	70	100
10BT80106	Prestressed Concrete							
10BT80107	Water Power Engineering							
10BT80108	Ground Water Development and Management							
10BT80109	Industrial Waste Water Treatment							
10BT80110	Natural Disaster Mitigation and Management							
10BT80111	Comprehensive Viva	-	-	-	2	100	-	100
10BT80112	Project Work	-	-	12	12	75	150	225
	TOTAL	12	2	12	**26**	265	360	**625**
		26						

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension

Letter writing

Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT10101: ENGINEERING MECHANICS

(for Civil Engineering)

L	T	P	C
3	1	-	6

UNIT–I

Statics of Particles: Basic concepts, system of units, system of concurrent coplanar forces in plane, resultant of forces, laws of mechanics, equilibrium of forces, Lami's theorem, vectorial representation of forces.

UNIT–II

Statics of Rigid Bodies: Moment of a force, Varignon's theorem, moment of a couple, vectorial representation of moments and couples, coplanar non-concurrent forces, equilibrium of rigid bodies, types of supports and loads, principle of virtual work, work done by forces and moments.

UNIT–III

Perfect Frames: Types of frames, free body diagram, degree of indeterminacy, analysis by method of joints and method of sections, tension coefficient method.

UNIT–IV

Friction: Types of friction, frictional force, laws of friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, application, body on horizontal/inclined plane, two bodies in contact, Ladder friction, Screw friction, Belt friction, Wedge friction.

UNIT–V

Centroid and Centre of Gravity: Determination of centroid: method of moments, method of integration, graphical method, theorem of Pappu's, centroid of a line, centroid of a volume, centre of gravity of rigid bodies.

UNIT–VI

Moment of Inertia: Parallel and perpendicular axis theorems, moment of inertia of composite sections, product of inertia, transfer of axes, principal axes of Inertia, mass moment of Inertia.

UNIT–VII

Kinematics of Particles: Basics of dynamics, rectilinear motion, motion with constant acceleration, freely falling bodies, curvilinear motion, motion of a projectile, uniform circular motion, relative motion.

UNIT–VIII

Kinetics of Particles: Kinetics of rectilinear motion, Newton's law of motion, D'Alembert's principle, motion of a lift, motion on an inclined plane, kinetics of circular motion, centrifugal force, super elevation of curves, rotation.

TEXT BOOKS

1. *Engineering Mechanics*, S. S. Bhavikatti and K. G. Rajashekarappa, New Age International (P) Ltd., 3rd Edition
2. *Engineering Mechanics: Statics (Vol. 1), Dynamics (Vol. 2),* J. L. Meriam and L. G. Kraige, John Wiley & Sons Ltd., 5th Edition

REFERENCES

1. *Engineering Mechanics - Statics and Dynamics,* Arthur P. Boresi and Richard J. Schmidt, Cengage Learning, 1st Edition
2. *Engineering Mechanics – Statics and Dynamics*, S. Rajasekaran and G. Sankarasubramanian, Vikas Publishing House Pvt. Ltd., 3rd Edition
3. *Singer's Engineering Mechanics - Statics and Dynamics*, K. Vijaya Kumar Reddy and J. Suresh Kumar, BS Publications, 3rd Edition
4. *Engineering Mechanics*, S. Timoshenko, D. H. Young and J. V. Rao, Tata McGraw-Hill Education Pvt. Ltd., Revised 4th Edition

B.Tech. I Year

10BT1EC01: **PROBLEM SOLVING AND COMPUTER PROGRAMMING**

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | $x^2 + y^2$| + $\sqrt{}$2xy
iii) $x^5 + 10\ x^4 + 8\ x^3 + 4\ x + 2$
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer_ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS04 **: MATRICES AND NUMERICAL METHODS**
(Common to Biotechnology and Civil Engineering)

L	T	P	C
4	1	-	4

UNIT – I
MATRICES AND LINEAR SYSTEM OF EQUATIONS : Matrices - Algebra of matrices – Inverse of a square matrix - Rank of a matrix – Echelon form – Normal form - Inverse of a matrix by normal form - Symmetric matrix – Skew-symmetric matrix – Hermitian matrix – Skew Hermitian matrix – Unitary matrix – Orthogonal matrix. Homogenous and Non Homogenous Linear systems – Consistency and solutions of linear system of equations - Direct methods – Gauss elimination method – Gauss-Jordan method.

UNIT - II
EIGEN VALUES AND EIGEN VECTORS : Evaluation of eigen values – Eigen vectors – Properties - Cayley Hamilton theorem (without proof) – Inverse and powers of a matrix using Cayley Hamilton theorem – Diagonalization.

UNIT - III
SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS AND CURVE FITTING : Solutions of algebraic and transcendental equations by bisection method – False position method – Newton Raphson's Method – Iterative method - Curve fitting by the principle of least squares – fitting of a straight line, parabola, exponential and power curves.

UNIT - IV
INTERPOLATION : Interpolation – Forward difference operator – Backward difference operator – Central difference operator – Relationship between the operators – Newton's forward formula – Newton's backward formula – Interpolation with unequal intervals – Lagrange's interpolation formula.

UNIT - V
NUMERICAL DIFFERENTIATION AND INTEGRATION : Numerical values of derivatives using Newton's forward formula – Newton's backward formula –Numerical integration - Trapezoidal rule - Simpsons 1/3 rule – Simpsons 3/8 rule.

UNIT - VI

NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS : Numerical Solutions of ordinary differential equations using Taylor's method – Euler's modified method – Picard's method – Runge-Kutta method – Milne's predictor corrector method.

UNIT - VII

PARTIAL DIFFERENTIAL EQUATIONS : Formation of partial differential equations - Solutions of first order partial differential equation using Lagrange's method - Method of separation of variables – Solutions of one dimensional wave equation - Heat equations.

UNIT - VIII

FOURIER SERIES : Fourier series of functions in $(0, 2\pi), (-\pi, \pi)$, $(0, 2l)$,$(-l, l)$ - Determination of Fourier coefficients – Euler's formulae – Even and odd functions – Periodic continuation – Half-range Fourier sine and cosine expansions.

TEXT BOOKS

1. T.K.V. Iyenger, B. Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad, *Mathematical Methods,* 5th Revised Edition, S. Chand Group, New Delhi, 2010.

REFERENCES

1. B.S. Grewal, *Higher Engineering Mathematics,* 40th Edition, Khanna Publishers, New Delhi, 2010.
2. Erwin Kreyszig, *Advanced Engineering Mathematics,* 9th Edition, John-Wiley & Sons, New Delhi, 2006.
3. S.S. Sastry, *Introductory Methods of Numerical Analysis,* 3rd Edition, Prentice Hall of India Pvt. Ltd., 2009 .
4. B.V. Ramana, *Mathematical Methods*, 2nd Edition, Tata McGraw Hill, 2010.

II B.Tech. I Semester

10BT30101 **: MECHANICS OF SOLIDS**

L	T	P	C
4	1	-	4

UNIT - I

SIMPLE STRESSES AND STRAINS : Elasticity and plasticity – Types of stresses and strains – Hooke's law – Stress-strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – Composite bars – Temperature stresses - Strain energy – Resilience – Gradual, sudden and impact loadings – Simple applications.

UNIT-II

SHEAR FORCE AND BENDING MOMENT : Types of beams, supports and loads – Concept of shear force and bending moment – SF and BM diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed load, uniformly varying load and combination of these loads – Point of contra flexure – Relation between SF, BM and rate of loading at a section of beam.

UNIT-III

STRESSES IN BEAMS :

Flexural Stresses: Theory of simple bending – Basic bending equation– Neutral axis – Bending stresses – Section modulus of rectangular and circular sections, I, T, Angle and Channel sections – Design of simple beam sections – Strain energy due to bending.

Shear Stresses: Basic shear stress equation – Shear stress distribution: Rectangular, circular, triangular, I, T, Angle sections – Strain energy due to shear.

UNIT-IV

COMBINED DIRECT AND BENDING STRESSES : Stresses under the combined action of direct loading and bending moment – Core of a section – Stresses in chimneys, retaining walls and dams – Conditions for stability – Stresses due to direct loading and bending moment about both axes.

UNIT-V

TORSION : Theory of pure torsion – Torsional equation – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending, torsion and end thrust – Design of shafts.

UNIT-VI

SPRINGS : Deflection of close and open coiled helical springs under axial load and axial twist – Springs in series and springs in parallel – Carriage springs.

UNIT-VII

THIN CYLINDERS : Thin cylindrical shells – Longitudinal and circumferential stresses – Hoop, longitudinal and volumetric strains – Changes in diameter and volume of thin cylinders.

UNIT-VIII

THICK CYLINDERS : Lame's theory – Distribution of hoop and radial stresses across thickness – Design of thick cylinders – Compound cylinders – Difference of radii for shrinkage.

TEXT BOOKS

1. Punmia, B. C., Ashok Kumar Jain and Arun Kumar Jain, *Mechanics of Materials*, 1st Edition, Laxmi Publications (P) Ltd**,** New Delhi, 2001.
2. Basavarajaiah, B.S. and Mahadevappa.P, *Strength of Materials,* 3rd Edition, Universities Press (India) Pvt. Ltd**.**, Hyderabad, 2010.

REFERENCES

1. *Rajput, R.K.,* Strength of Materials (Mechanics of Solids), *5th Edition, S. Chand Group, New Delhi, 2006.*
2. Junnarkar, S. B. and Shah, H. J., *Mechanics of Structures vol. I (Strength of Materials),* 27th Revised and Enlarged Edition, Charotar Publishing House Pvt. Ltd., Anand, 2008.
3. Bhavikatti, S. S., *Strength of Materials*, 3rd Edition, Vikas Publishing House**,** New Delhi,
4. Khurmi, R. S., *Strength of Materials,* 23rd Edition, S. Chand Group, New Delhi, 1968.

II B.Tech. I Semester

10BT30102 **: BUILDING MATERIALS AND CONCRETE TECHNOLOGY**

L	T	P	C
4	-	-	4

UNIT – I

STONES, BRICKS AND TILES : Properties of building stones – Relation to their structural requirements – Classification of stones – Stone quarrying – Precautions in blasting – Dressing of stone – Composition of good brick earth – Various methods of manufacture of bricks – Qualities of a good brick – Efflorescence in Bricks – Classification of bricks – Characteristics of good tile – Manufacturing methods - Types of tiles.

UNIT – II

LIME AND CEMENT : Various ingredients of lime – Constituents of lime stone – Classification of lime – Various methods of manufacture of lime – Ingredients of cement – Manufacture of OPC –Types of cement and their properties – Various field and laboratory tests on cement.

UNIT-III

TIMBER : Structure – Properties – Seasoning of timber – Classification of various types of woods used in buildings – Defects in timber - Decay of timber – Mechanical treatment – Paints – Varnishes – Distempers - Bituminous wooden products in construction.

UNIT-IV

OTHER MATERIALS IN CONSTRUCTION : Use of Materials like galvanized iron, steel, aluminium, gypsum, copper, glass, bituminous materials, rubber, fiber-reinforced plastics, ceramic products, asbestos and their quality.

UNIT – V

CEMENT CONCRETE : Various ingredients of cement concrete and their importance – Proportioning of concrete - Water-cement ratio – Workability of concrete - Factors influencing workability – Measurement of workability - Effect of time and temperature on workability – Segregation and bleeding – Mixing and vibration of concrete – Quality of mixing water.

UNIT – VI

HARDENED CONCRETE : Nature of strength of concrete – Maturity concept – Strength in tension and compression – Factors affecting strength – Relation between compression and tensile strength - Curing.

TESTS ON HARDENED CONCRETE: Compression test – Tension test – Factors affecting strength – Flexure test – Non-destructive testing methods

UNIT – VII

ELASTICITY, CREEP AND SHRINKAGE : Modulus of elasticity – Dynamic modulus of elasticity – Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep and time – Effects of creep – Shrinkage – Types of shrinkage.

MIX DESIGN : Factors in the choice of mix proportions - BIS and ACI methods of mix design.

UNIT – VIII

SPECIAL CONCRETES : Light weight aggregates - Cellular concrete – No-fines concrete – High density concrete – Fiber reinforced concrete – Different types of fibers – Factors affecting properties of FRC – Applications – Polymer concrete – Types of polymer concrete – Properties of polymer concrete – Applications – High performance concrete – Self consolidating concrete .

TEXT BOOKS

1. S. K. Duggal, *Building material*, 3rd Edition, New Age International Publishers, 2010.
2. M.S. Shetty, *Concrete Technology*, 6th Edition, S. Chand and Company Ltd., New Delhi, 2011.

REFERENCES

1. Rajput R.K., *Engineering Materials*, 1st Edition, S. Chand and Company Ltd., New Delhi, 2000.
2. P.C. Varghese, *Building Materials*, Prentice-Hall of India Private Ltd., New Delhi, 2011.
3. A.M. Neville, *Properties of Concrete*, 4th Edition, John Wiley and Sons, New Delhi, 1996.
4. M.L. Gambhir, *Concrete Technology*, 3rd Edition, Tata McGraw-Hill Publishers, New Delhi, 2008.
5. A.R. Santha Kumar, *Concrete Technology*, 7th Edition, Oxford University Press, New Delhi, 2011.

II B.Tech. I Semester

10BT30103 **: BASICS OF ELECTRICAL AND MECHANICAL TECHNOLOGY**

PART –A
ELECTRICAL TECHNOLOGY

L	T	P	C
4	-	-	4

UNIT - I
ELECTRICAL CIRCUITS AND CABLES : Basic definitions - Types of elements - Ohm's law - Resistive networks - Kirchhoff's laws - Inductive networks - Capacitive networks - Series and parallel circuits - Star-delta and delta-star transformations - Types of cables.

UNIT - II
DC MACHINES : Principle of operation of DC Generator – EMF equation - Types – DC motor types – Torque equation – Applications – Three point starter.

UNIT - III
TRANSFORMERS : Principle of operation of single phase transformers – EMF equation – Losses – Efficiency and regulation.

UNIT - IV
AC MACHINES : Principle of operation of alternators – Regulation by synchronous impedance method – Principle of operation of induction motor – Slip – Torque characteristics – Applications.

TEXT BOOKS

1. M.S Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering*, Tata McGraw-Hill Publications Ltd., New Delhi, 2009.
2. V.K. Mehta and Rohit Mehta, *Principles of Electrical Engineering*, S. Chand and Company Ltd., New Delhi, 2006.
3. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*, Oxford University Press, New Delhi, 2009.

REFERENCES

1. D.P. Kothari and I. J. Nagrath, *Theory and Problems of Basic Electrical Engineering,* Prentice Hall of India, New Delhi, 2009.
2. P.S. Bimbhra, *Electrical Machinery*, 7th Edition, Khanna Publishers, New Delhi, 2005.

PART - B

MECHANICAL TECHNOLOGY

UNIT - V

WELDING PROCESSES : Introduction, classification of welding processes - Arc welding and gas welding – Equipment, welding fluxes and filler rods – Submerged arc welding, TIG and MIG processes - Soldering and brazing importance – Applications.

UNIT - VI

INTERNAL COMBUSTION ENGINES : Introduction, Classification and Main components of IC Engines – Working principle of petrol and diesel engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Lubrication and fuel systems of petrol and diesel engines.

UNIT - VII

REFRIGERATION AND AIR CONDITIONING : Terminology of refrigeration and air conditioning – Refrigerants and their desirable properties – Methods of refrigeration: Vapour compression and vapour absorption systems - Basic principles of air conditioning – Room air conditioning systems - Comfort air conditioning systems.

UNIT - VIII

AIR COMPRESSORS AND EARTH MOVING MACHINERY : Working principles of air compressors – Reciprocating air compressor: single and multi stage compression – Earth moving machines and mechanical handling equipment – Bull dozers – Power showels – Excavators – Concrete mixer – Belt and bucket conveyors.

TEXT BOOKS

1. R.S. Khurmi, *A Text Book of Thermal Engineering: Mechanical Technology,* S. Chand Group, Delhi, 2008.
2. R. K. Rajput,*Thermal Engineering*, 8th Edition, Laxmi Publishers, New Delhi, 2010.

REFERENCES

1. Khurmi, R. S and Gupta, J.K.,*Refrigeration and Air Conditioning*, 5th Edition, S. Chand Group, Delhi, 2011.
2. S.K. Hajra Choudhary and S.K. Bose, *Elements of Workshop Technology – Vol. I and II*, 2nd Edition, Asia Publishing House, Bombay, 2008.
3. Kripal Singh, *Automobile Engineering - Vol. II: Engine and Electrical Equipment*, 12th Edition, Standard Publishers Distributors, New Delhi, 2011.

II B.Tech. I Semester

10BT30104 **: SURVEYING**

L	T	P	C
4	1	-	4

UNIT – I

LINEAR MEASUREMENTS AND CHAIN SURVEYING : Principle – Classification - Accuracy and errors - Linear measurements - Direct measurements - Instruments for chaining – Ranging out survey lines – Errors in chaining – Tape corrections - Chain triangulation - Field book - Instruments for setting right angles - Basic problems in chaining - Obstacles for chaining.

UNIT – II

COMPASS AND PLANE TABLE SURVEYING :

Compass Survey: Types of compass – Bearings - Included angles– Declination - Dip and local attraction.

Plane Table Survey: Components – Setting – Methods – Radiation– Traversing - Intersection and Resection.

UNIT – III

LEVELING AND CONTOURING : Types of levels - Dumpy level and tilting level - Temporary and permanent adjustments - Height of instrument and rise and fall methods - Effect of curvature and refraction - Characteristics of contours - Direct and indirect methods of contouring and plotting of contours - Uses of contour maps.

UNIT – IV

COMPUTATION OF AREAS AND VOLUMES :

Areas: Areas dividing into number of triangles - By offsets to a base line - By latitudes and departures (D.M.D. and D.P.D) - By coordinates - Areas from maps.

Volumes : Volume from cross-section - Embankments and cutting for a level section and two level sections with and without transverse slopes - Determination of the capacity of reservoir - Volume of barrow pits - Spot levels from contours.

UNIT – V

THEODOLITE : Description and uses of vernier micrometer – Micro-optic theodolites – Temporary and permanent adjustments of vernier transit – Measurement of horizontal and vertical angles – Heights and distances – Traversing – Closing error and distribution – Gale's traverse table – Omitted measurements.

UNIT – VI

TACHEOMETRIC SURVEYING : Principle of stadia method – Distance and elevation formulae for staff held vertical –Instrumental constants – Anallactic lens – Tangential method – Use of subtense bar –Tacheometric contouring.

UNIT – VII

CURVES : Types of curves - Linear and angular methods of setting out of simple curves – By offsets from long chord – By offsets from tangents - By successive bisection of arcs of chords – By offsets from chords produced – Two theodolite method.

UNIT – VIII

ELECTRONIC DISTANCE MEASUREMENT AND GIS :

Electronic Distance Measurement: Basic concepts - Classification of electronic radiation - Basic principle of electronic distance measurement - Computing the distance from the phase differences - Total station- Instrumental errors in EDM.

Geographical Information System : Introduction to geodetic surveying - Global positioning system (GPS) - Introduction to geographic information system (GIS).

TEXT BOOKS

1. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Surveying - Vol. I, II and III*, 15th Edition, Laxmi Publications (P) Ltd., New Delhi, 2010.
2. S. K. Duggal, *Surveying - Vol. I and II*, 3rd Edition, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 2010.

REFERENCES

1. R. Subramanian, *Surveying and Leveling*, 1st Edition, Oxford University Press, New Delhi, 2010.
2. Arthur R. Benton and Philip J. Taety, *Elements of Plane Surveying*, 3rd Edition, McGraw Hill, 2010.
3. Arora, K. R., *Surveying - Vol. I, II and III*, 10th Edition, Standard Book House, Delhi, 2011.
4. Chandra, A.M, *Plane Surveying,* 2nd Edition, New Age International Publishers, New Delhi, 2010.
5. Chandra, A M, *Higher Surveying,* 2nd Edition, New age International Publishers, New Delhi, 2010.

II B.Tech. I Semester

10BT30105 **: FLUID MECHANICS - I**

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UNIT – I

PROPERTIES OF FLUIDS AND PRESSURE MEASUREMENTS : Dimensions and units – Physical properties of fluids – Mass density- specific weight- specific volume- specific gravity - ideal and real fluids- Newtonian and non-Newtonian fluids – Viscosity - Surface tension - Vapour pressure and their influences on fluid motion - Pressure at a point - Pascal's law - Hydrostatic law - Atmospheric, gauge and absolute pressures - Measurement of pressure - Pressure gauges – Manometers - Differential and micro manometers.

UNTI – II

HYDROSTATIC FORCES : Hydrostatic forces on submerged plane surfaces – Total pressure and centre of pressure on plane and curved surfaces – Calculation of total pressure from pressure diagrams.

UNTI – III

FLUID KINEMATICS : Description of fluid flow - Stream line - Path line and streak lines - Stream tube - Classification of flows - Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one dimensional flows – stream and velocity potential functions - Flownet and its uses.

UNIT – IV

FLUID DYNAMICS : Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line – Momentum equation and its application – Momentum and kinetic Energy correction factors – Forces on pipe bend.

UNIT – V

CLOSED CONDUIT FLOW : Laws of fluid friction – Darcy-Weisbach equation - Minor losses – Pipes in series – Pipes in parallel – Total energy line and hydraulic gradient line - Pipe network problems - Variation of friction factor with Reynold's number – Moody's chart.

UNIT – VI

MEASUREMENT OF FLOW : Pitot tube - Venturimeter and orifice meter – Orifices and mouthpieces - Rectangular, triangular and trapezoidal notches – Broad crested weirs.

UNIT – VII

LAMINAR AND TURBULENT FLOW : Reynold's experiment - Characteristics of laminar and turbulent flows – Laminar flow through circular pipes - Flow between parallel plates - Hydrodynamically smooth and rough boundaries.

UNIT – VIII

HYDRAULIC SIMILITUDE : Dimensional analysis - Rayleigh's method and Buckingham's pi theorem - Model studies – Geometric, kinematic and dynamic similarities - Dimensionless numbers – Model laws – Scale effects.

TEXT BOOKS

1. P.N. Modi and S.M. Seth, *Hydraulics and Fluid Mechanics,* 18th Edition, Standard Book House, Delhi, 2011.
2. R.K. Bansal, *Fluid Mechanics and Hydraulic Machines*, 9th Edition, Laxmi Publishers, New Delhi, 2011.

REFERENCES

1. R.K. Rajput, *Fluid Mechanics and Hydraulic Machinery,* 4th Edition, S. Chand Publishers, New Delhi, 2010.
2. J.F. Douglas, J.M. Gaserek and J.A. Swaffirld, *Fluid Mechanics,* 5th Edition, Longman, 2010.
3. A.K. Mohanty,*Fluid Mehanics*, 2nd Edition, Prentice Hall of India Pvt. Ltd., New Delhi, 2010.
4. S.K. Som and G. Biswas, *Introduction to Fluid Machines*, 2nd Edition, Tata McGraw-Hill Publishers Pvt. Ltd, 2010.

II B.Tech. I Semester

10BT30111 : **SURVEYING LAB – I**

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LIST OF EXERCISES

A) CHAIN SURVEY

1. Study of chains and its accessories - Aligning, Ranging and Chaining
2. Cross staff survey and plotting
3. Chaining across obstacles and plotting
4. Chain traversing and plotting

B) COMPASS SURVEY

5. Study of prismatic compass – Measurement of bearings of lines
6. Determination of area by radiation method and plotting
7. Determination of distance between two inaccessible points with compass
8. Compass traversing and plotting

C) PLANE TABLE SURVEY

9. Study of plane table and its accessories
10. Radiation and Intersection methods by plane table survey
11. Plane table traversing
12. Resection - Two point and three point problems

D) LEVELLING

13. Study of Dumpy level/Auto level and levelling staff
14. Fly levelling (differential levelling)
15. Longitudinal and cross-sectioning of a road profile and plotting.
16. Contouring exercise

II B.Tech. I Semester

10BT30112 : STRENGTH OF MATERIALS LAB

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LIST OF EXPERIMENTS

1. Tension test on mild steel / HYSD bar
2. Compression test on wood
3. Compression test on coiled spring
4. Tension test on coiled spring
5. Bending test on carriage spring
6. Brinell and Rockwell hardness tests
7. Charpy and Izod impact tests
8. Shear test on mild steel
9. Bending test on simply supported beam
10. Bending test on cantilever beam
11. Bending test on fixed beam
12. Bending test on continuous beam
13. Verification of Maxwell's reciprocal theorem
14. Torsion test on mild steel

II B.Tech. II Semester

10BT3BS01 **: PROBABILITY AND STATISTICS**

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UNIT - I

PROBAILITY MATHEMATICAL EXPECTATIONS :

Introduction to Probability : Definition of random experiment, events and sample space – Definition of probability – Addition and multiplication theorems - Conditional probability – Baye's theorem – Simple problems on Baye's theorem.

Random Variable : Discrete and continuous random variables - Distribution function of random variable – Properties – Probability mass function - Probability density function – Mathematical expectation – Properties of mathematical expectations – Mean and variance.

UNIT - II

PROBABILITY DISTRIBUTIONS :

Discrete Distributions : Binomial distribution – Mean and standard deviations of Binomial distribution – Poisson distribution – Mean and standard deviations of Poisson distribution – Applications.

Continuous Probability Distributions : Uniform distribution – Exponential distribution – Normal distribution – Properties of normal distribution – Importance of normal distribution – Area properties of normal curve.

UNIT-III

CORRELATION AND REGRESSION :

Correlation : Definition - Measures of correlation – Correlation for bivariate distribution – Rank correlation coefficients.

Regression : Simple linear regression – Regression lines and properties.

UNIT-IV

SAMPLING DISTRIBUTIONS : Population and sample – Parameter and statistic – Sampling distribution of statistic – Standard error of statistic – Null and alternative hypotheses – Type I and II errors – Level of significance – Critical region –Degrees of freedom.

UNIT-V

LARGE SAMPLES TEST OF SIGNIFICANCE : Test of significance for single proportion – Test of significance for difference of proportions - Test of significance for a single mean - Test of significance for difference of means – Test of significance for difference of standard deviations.

UNIT – VI

SMALL SAMPLES TEST OF SIGNIFICANE : Student's t-test – F-test for equality of population variance – Chi-square test of goodness of test – Contingency table – Chi-square test for independence of attributes.

UNIT – VII

STATISTICAL QUALITY CONTROL : Introduction – Advantages and limitations of statistical quality control – Control charts – Specification limits - , R, np and c charts.

UNIT – VIII

QUEUING THEORY : Queuing theory – Pure birth and death process – M/M/1 Model – Problems.

TEXT BOOKS

1. T.K.V. Iyengar, B. Krishna Gandhi and Others, *Probability and Statistics*, 3rd Edition, S. Chand Group, New Delhi, 2011.
2. Shahnaz Bathul, *A Text Book of Probability and Statistics*, 2nd Edition, Ridge Publications, Hyderabad.
3. Kandaswamy and Tilagavathy, *Probability Statistics and Queuing Theory,* 1st Edition, S. Chand Group, New Delhi, 2004.

REFERENCES

1. Miller and John E. Freund, *Probability and Statistics for Engineers*, 7th Edition, Pearson Higher Education, 2010.
2. Ronald E. Walpole, *Probability and Statistics for Engineers and Scientists*, 8th Edition, Pearson Education India, New Delhi, 2007.
3. S.C. Gupta and V.K. Kapoor, *Fundamentals of Mathematical Statistics,* 11th Edition, Sutan and Chand, New Delhi, 2007.
4. S.C. Gupta and V.K. Kapoor, *Fundamentals of Applied Statistics*, 3rd Edition, Sultan and Chand, New Delhi, 2009.

II B.Tech. II Semester

10BT40101 **: STRUCTURAL ANALYSIS - I**

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UNIT-I

PRINCIPAL STRESSES AND STRAINS : Stresses on an inclined plane under axial loading – Compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains.

UNIT-II

DEFLECTION OF BEAMS - I : Bending into a circular arc – Slope, deflection and radius of curvature – Differential equation for the elastic curve of a beam – Double integration and Macaulay's methods - Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L. and uniformly varying load.

UNIT-III

DEFLECTION OF BEAMS - II : Mohr's theorems – Moment area method – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L., Uniformly varying load - Application to simple cases including overhanging beams.

UNIT-IV

COLUMNS AND STRUTS : Types of columns – Short, medium and long columns – Axially loaded compression members – Euler's theorem for long columns – Euler's critical load – Equivalent length of a column – Slenderness ratio – Limitations of Euler's theory – Rankine-Gordon formula – Long columns subjected to eccentric loading – Secant formula.

UNIT-V

THEORIES OF FAILURE : Maximum principal stress theory - Maximum principal strain theory - Maximum shear stress theory - Maximum strain energy theory - Maximum shear strain energy theory.

UNIT-VI

UNSYMMETRICAL BENDING AND SHEAR CENTRE : Centroidal principal axes of section - Moment of inertia referred to any set of rectangular axes - Stress in beams due to unsymmetrical bending - Principal axes - Resolution of bending moment into two rectangular axes through the centroid - Location of neutral axis – Shear centre of channel section and unequal section.

UNIT-VII

FIXED BEAMS AND PROPPED CANTILEVERS : Introduction to statically indeterminate beams – Fixed end moment due to uniformly distributed load, point loads, uniformly varying load, couple and combination of loads - Shear force and Bending moment diagrams – Deflection of fixed beams - Effect of sinking of support - Effect of rotation of a support - Shear force and Bending moment diagrams of propped cantilever.

UNIT-VIII

CONTINUOUS BEAMS : Clapeyron's theorem of three moments – Analysis of continuous beams with one or both ends fixed - Continuous beams with overhang.

TEXT BOOKS

1. R.S.Khurmi, *Theory of Structures,* 11th Edition, S.Chand Publications, New Delhi, 2010.
2. V.N. Vazirani, M.M.Ratwani and S.K.Duggal, *Analysis of Structures-Vol.I* (17th Edition) *and Vol.II* (16th Edition), Khanna Publications, New Delhi, 2011.

REFERENCES

1. H.J.Shah and S.B.Junnarkar, *Mechanics of Structures – Vol. II,*21st Edition, Charotar Publishing House, Anand, Gujrat, 2010.
2. Pandit, G., Gupta, S. and Gupta, R., *Theory of Structures – Vol. I,* 2nd Edition, Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi, 1999.
3. B.C.Punmia, *Strength of Materials and Mechanics of Structures*, 7th Edition, Standar Publishers Distributors, New Delhi, 1986.
4. Ramamrutham, S. and Narayanan, R., *Theory of Structures,* 9th Edition, Dhanpat Rai Publishing Co. Ltd., New Delhi, 2010.

II B.Tech. II Semester

10BT40102 **: FLUID MECHANICS - II**

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UNIT – I

BOUNDARY LAYER THEORY : Boundary layer concepts - Thickness of boundary layer - Characteristics of boundary layer along a thin flat plate - Vonkarmen momentum integral equation - Laminar and turbulent boundary layers (no derivation) - Laminar sub-layer separation of boundary layer - Control of boundary layer- Flow around submerged objects – Drag and lift - Magnus effect.

UNIT – II

OPEN CHANNEL FLOW - I : Types of flows – Types of channels – Velocity distribution – Chezy's, Manning's and Bazin's formulae for uniform flow – Most Economical sections - Critical flow - Specific Energy - Critical depth – Computation of critical depth – Critical, sub-critical and super critical flows – Velocity measuring instruments.

UNIT – III

OPEN CHANNEL FLOW - II : Non uniform flow - Dynamic equation for gradually varied flow - Mild, critical, steep, horizontal and adverse slopes - Surface profiles - Direct step method – Rapidly varied flow - Hydraulic jump and its applications - Energy dissipation.

UNIT – IV

IMPACT OF JETS : Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes - Series of vanes - Jet striking centrally and at tip - Velocity triangles at inlet and outlet - Expressions for work done and efficiency - Applications to radial flow turbines.

UNIT – V

HYDRAULIC TURBINES – I : Layout of a typical hydropower installation – Heads and efficiencies -classification of turbines - Pelton wheel - Francis turbine - Kaplan turbine - Working, working proportions - Velocity diagrams **-** Work done and efficiency - Hydraulic design – Runaway speed - Draft tube theory, function and efficiency.

UNIT – VI

HYDRAULIC TURBINES – II : Governing of turbines - Surge tanks - Unit quantities and specific speed – Performance characteristics - Geometric similarity - Cavitation, causes, effects.

UNIT – VII

CENTRIFUGAL PUMPS : Pump installation details – Classification - Heads – Losses and efficiencies - Limitation of suction lift - Work done - Minimum starting speed - Specific speed - Multistage pumps -Pumps in parallel - Performance of pumps - Characteristic curves - Net positive suction head – Priming devices - Cavitation.

UNIT – VIII

HYDROPOWER ENGINEERING : Classification of hydropower plants – Load factor - Utilization factor - Capacity factor - Estimation of hydropower potential.

TEXT BOOKS

1. P.N. Modi and S.M. Seth, *Hydraulics and Fluid Mechanics,* 18th Edition, Standard Book House, Delhi, 2011.
2. K, Subramanya, *Flow in Open Channels,* 3rd Edition, Tata McGraw-Hill Publishers, New Delhi, 2010.
3. D.S. Kumar, *Fluid Mechanics and Fluid Power Engineering,* 7th Edition, Kataria and Sons, Delhi, 2009.
4. R.K. Bansal, *Fluid Mechanics and Hydraulic Machines,* 9th Edition, Laxmi Publishers, New Delhi, 2011.

REFERENCES

1. Ranga Raju, *Flow Through Open Channels,* 7th Edition, Tata McGraw-Hill Publications, New Delhi, 2009.
2. R.K. Rajput, *Fluid Mechanics and Hydraulic Machinery,* 4th Edition, S. Chand Publishers, New Delhi, 2010.
3. V.T .Chow, *Open Channel Flow,* McGraw-Hill Publishers, New Delhi, 1996.
4. Banga and Sharma, *Hydraulic Machines,* 7th Edition, Khanna Publishers, New Delhi, 2007.
5. M.M. Dandekar and K.N. Sharma, *Water Power Engineering,* 1st Edition, Vikas Publishing House, New Delhi, 2009.

II B.Tech. II Semester

10BT40103 **: REINFORCED CEMENT CONCRETE STRUCTURES - I**

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UNIT –I

CONCRETE : Constituents of concrete - IS 456 Recommendations - Grades of concrete - Working stress method - Design constants – Design for flexure - Singly reinforced beams.

UNIT –II

LIMIT STATE DESIGN : Concepts of limit state design – Comparison with working stress method - Basic statistical principles – Characteristic loads – Characteristic strength – Partial safety factors – Stress-strain curves for cold worked deformed bars and mild steel bars - Assumptions in limit state design – Stress-block parameters – Limiting moment of resistance.

UNIT –III

BEAMS : Limit state design of singly reinforced, doubly reinforced, T and L beams for flexure.

UNIT – IV

SHEAR, TORSION AND BOND : Limit state design of section for shear and torsion – Concept of bond, anchorage and development lengths - I.S. Code provisions - Design of simply supported and continuous beams, including detailing.

UNIT – V

COLUMNS : Short and long columns under axial loads, uniaxial bending and biaxial bending – Slender columns – I S Code provisions.

UNIT –VI

FOOTINGS : Different types of footings – Design of isolated square, rectangular and circular footings.

UNIT – VII

SLABS : Design of one way slab - Two-way slab - Continuous slab using I S Coefficients.

UNIT –VIII

SERVICEABILITY : Limit state design of serviceability for deflection and cracking – I S Code provisions.

TEXT BOOKS

1. S. Unnikrishna Pillai and Devdas Menon, *Reinforced Concrete Design,* 3nd Edition, Tata Mc.Graw Hill, New Delhi, 2010.
2. S.K. Ray and N.C. Sinha, *Fundamentals of Reinforced Concrete,* 5th Edition, S. Chand Publishers, 2010.

REFERENCES

1. P.C. Varghese, *Limit State Designed of Reinforced Concrete,* 2nd Edition, Prentice Hall of India, New Delhi, 2010.
2. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Reinforced Concrete Structures - Vol. I,* 19th Edition, Laxmi Publications Pvt. Ltd., New Delhi, 2010.
3. N. Krishna Raju and R.N. Pranesh, *Reinforced Concrete Design,* 3rd Edition, CBS Publishers Distributors, New Delhi, 2010.
4. M.L. Gambhir, *Fundamentals of Reinforced Concrete Design,* Printice Hall of India Pvt. Ltd., New Delhi, 2010.

Codes: IS 456-2000 code book is to be permitted into the examination hall.

II B.Tech. II Semester

10BT40104 **: CONSTRUCTION, PLANNING AND PROJECT MANAGEMENT**

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UNIT – I

MASONRY AND FOUNDATIONS :

Masonry : Types of masonry – English and Flemish bonds – Rubble and Ashlar masonry – Cavity walls – Partition walls.

Foundations : Foundations: Shallow foundations – Spread, combined, strap and mat footings.

UNIT – II

BUILDING COMPONENTS : Lintels, arches, vaults, stair cases – Different types of floors - Concrete, mosaic, terrazzo floors – Pitched, flat and curved roofs – Lean-to-Roof, coupled roofs, trussed roofs - King and Queen post trusses - RCC Roofs - Madras Terrace/Shell Roofs.

UNIT – III

FINISHINGS : Damp Proofing , water proofing, Termite proofing, Fire proof- materials used – Plastering – Pointing – White washing and distempering – Painting – Constituents of a paint – Types of paints – Painting of new/old Wood – Varnish – Form work and scaffolding.

UNIT – IV

ORGANIZATION : Types of organization – Merits and demerits of different types of organization – Authority – Policy – Recruitment process and training – Development of personnel department – Labour Problems – Labour legislation in India – Workmen's Compensation Act of 1923 and Minimum Wages Act of 1948, and subsequent amendments– Safety in construction.

UNIT – V

RESOURCE MANAGEMENT :

Manpower: Resource smoothing – Resource leveling – Establishing workers productivity.

Materials : Objectives of material management – Costs – Functions of material management departments – ABC classification of materials – Inventory of materials – Material procurement – Stores management.

Machinery : Classification of construction equipment – Earth moving equipment - Excavation equipment - Hauling equipment - Earth compaction equipment - Hoisting equipment - Concreting plant and equipment – Time and motion study – Selection of equipment –

Task consideration – Cost consideration – Factors affecting the selection - Factors affecting cost owning and operating the equipment – Equipment maintenance.

UNIT – VI

PROJECT MANAGEMENT, BAR CHARTS AND MILESTONE CHARTS: Project planning – Scheduling – Controlling – Role of decision in project management – Techniques for analyzing alternatives - Operation research – Methods of planning and programming problems – Development of bar chart – Illustrative examples – Shortcomings of bar charts and remedial measures – Milestone charts – Development of PERT network problems.

UNIT – VII

ELEMENTS OF NETWORK AND DEVELOPMENT OF NETWORK : Introduction – Event – Activity – Dummy – Graphical guidelines for network – Common partial situations in network – Numbering the events – Cycles Problems – Planning for network construction – Modes of network construction – Steps in development of network – Work breakdown structure – Hierarchies – Illustrative examples.

UNIT – VIII

PERT AND CPM : Network analyses - PERT – Slack – Critical path – Illustrative examples – Probability of meeting scheduled date Problems – CPM Process – CPM Networks – Activity time estimate – Earliest event time – Latest allowable occurrence time – Combined tabular computations for T_E and T_L - Start and finish times of activity – Float – Critical activities and critical path – Illustrative examples.

TEXT BOOKS

1. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain,*Building Construction,* 10th Edition, Laxmi Publications (P) Ltd., New Delhi, 2010**.**
2. B.C.Punmia, K.K. Khandelwal, *Project Planning and Control with PERT and CPM,* 4th Edition, Lakshmi Publications(P). Ltd., New Delhi, 2010.
3. Jha, *Construction Project Management,* 1st Edition, Pearson Pubilications, New Delhi, 2011.

REFERENCES

1. S. Seetharaman, *Construction Engineering and Management,* 3rd Edition, Umesh Publications, Delhi, 2010.
2. R. Chudly, *Construction Technology – Vol. I and Vol. II,* 4th Edition, Longman, UK, 1987.
3. P.K. Joy, *Total Project Management: The Indian Context*, 1st Edition, Mac Millan Publishers India Limited, 1993.

II B.Tech. II Semester

10BT3BS02 **: ENVIRONMENTAL SCIENCES**

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UNIT-I

INTRODUCTION TO ENVIRONMENTAL SCIENCES : Definition and concept of the term Environment – Various components of Environment – Abiotic and biotic – Atmosphere – Hydrosphere – Lithosphere – Biosphere – Inter relationships – Need for public awareness – Role of important National and International individuals and organizations in promoting Environmentalism.

UNIT-II

NATURAL RESOURCES, CONSERVATION AND MANAGEMENT : Renewable and Non renewable resources and associated problems – Forests: Deforestation, Causes, effects and remedies – Effects of mining, dams and river valley projects – case studies; Water resources: Water use and over exploitation – Conflicts over water – Large dams – benefits and problems; Food resources : World food problems – Adverse effects of modern agriculture – Fertilizer and pesticide problems; Land resources: Land degradation – Land slides- Soil erosion – desertification- water logging – salinity – Causes, effects and remedies; Mineral resources: Mining – Adverse effects; Energy resources: Growing needs – Renewable and Non renewable resources – Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear Energy, Hydrogen fuel, Solar - Impact on environment - Sustainable life styles.

UNIT-III

ECOLOGY AND ECOSYSTEMS : Definitions and concepts – Characteristics of ecosystem – Structural and functional features – Producers, consumers and decomposers and food webs – Types of ecosystems – Forests grassland, desert, crop land, pond, lake, river and marine ecosystems – Energy flow in the ecosystem – Ecological pyramids – Ecological successions.

UNIT-IV

BIODIVERSITY, CONSERVATION AND MANAGEMENT :

Introduction – Definition and concept of biodiversity – Value of biodiversity – Role of biodiversity in addressing new millennium challenges – Global, national biodiversity – Hot spots of biodiversity– Threats to biodiversity – Man and wild life conflicts – Remedial measures – Endemic, endangered and extinct species – In-situ and Ex-situ conservation of biodiversity.

UNIT-V

ENVIRONMENTAL POLLUTION AND CONTROL : Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution – Solid waste management – Causes, effects, control and disposal methods – Role of individuals in the prevention of pollution – Hazards and disaster management – Floods – Earthquakes – Tsunamis – Cyclones – Land slides – Case studies.

UNIT-VI

SOCIAL ISSUES AND THE ENVIRONMENT : Concept of sustainable development – Methods of rainwater harvesting – Watershed management – waste land reclamation – Green cover – Green power – Green technology – Resettlement and rehabilitation of people and related problems – Case studies – Issues and possible solutions - Greenhouse effect and global warming – Carbon credits – Acid rains – Ozone layer depletion – Causes, effects and remedies – Consumerism and waste production – Environment protection acts – Air (Prevention and Control of Pollution) Act – Water Act – Forest Conservation Act – Wild Life Protection Act – Issues involved in the enforcement.

UNIT-VII

HUMAN POPULATION AND ENVIRONMENT : Population growth and its impact on environment – Environmental ethics – Family welfare programmes – Human health: T.B., Cancer, HIV/AIDS – Causes, effects and remedies – Occupational health hazards – Human rights – Important international protocols and conventions on Environment.

UNIT-VIII

FIELD WORK/ ENVIRONMENTALIST'S DIARY / ASSIGNMENTS/ SEMINARS

TEXT BOOKS

1. Erach Barucha, *Environmental Studies*,1st Edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies,* 3rd Edition, New Age International Publishers, 2011

REFERENCES

1. Deshwal, *Environmental Studies,* 2nd Edition, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies,* 1st Edition, Oxford UniversityPress, 2009.
3. Joseph Benny, *Environmental Studies,* 2nd Edition, Tata McGraw-Hill, New Delhi, 2010.

II B.Tech. II Semester

10BT40111 **: SURVEYING LAB – II**

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LIST OF EXERCISES

A) THEODOLITE SURVEY

1. Study of theodolite - Measurement of horizontal and vertical angles.
2. Measurement of horizontal angles by method of repetition and method of reiteration.
3. Finding out distance between two inaccessible points.
4. Trigonometric levelling - Measurement of heights and distances (Two Exercises)
5. Tacheometric surveying - Measurement of heights and distances (Two Exercises)
6. Setting out a circular curve by Rankine's method of tangential angles.
7. Setting out a circular curve by Double Theodolite method.
8. Setting out works for buildings and pipe lines.

B) TOTAL STATION SURVEY

9. Study of total station - Measurement of horizontal angles, vertical angles and distances
10. Determination of area using total station.
11. Determination of remote height using total station
12. Distance, gradient, and differential height between two inaccessible points using total station
13. Stake-out using total station
14. Traversing using total station
15. Contouring using total station

II B.Tech. II Semester

10BT40112 **: FLUID MECHANICS AND HYDRAULIC MACHINERY LAB**

L	T	P	C
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LIST OF EXPERIMENTS

Any **TWELVE** experiments are to be conducted .

1. Calibration of venturimeter
2. Calibration of orificemeter
3. Determination of coefficient of discharge for a small orifice by a constant head method.
4. Determination of coefficient of discharge for an external mouth piece by variable head method.
5. Calibration of rectangular notch
6. Calibration of triangular notch
7. Determination of loss of head due to sudden contraction
8. Determination of loss of head due to sudden expansion
9. Determination of friction factor for pipes
10. Verification of Bernoulli's equation.
11. Impact of jet on vanes
12. Study of hydraulic jump.
13. Performance test on Pelton wheel turbine
14. Performance test on Francis turbine
15. Performance test on Kaplan turbine.
16. Performance test on single stage centrifugal pump
17. Performance test on multi stage centrifugal pump
18. Performance test on reciprocating pump

III B.Tech. I Semester

10BT4HS01 **: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY**

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UNIT – I

INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS : Definition, Nature and scope of managerial economics. **Demand Analysis:** Determinants of demand – Demand function - Law of demand and its exceptions - Elasticity of demand – Types - Measurement and significance of elasticity of demand - Demand forecasting and methods of demand forecasting.

UNIT – II

THEORY OF PRODUCTION AND COST ANALYSIS :

Production Function: Isoquants and isocosts – Input-output relationship - Law of returns - Internal and external economies of scale.

Cost Concepts : Opportunity vs. out lay costs, Fixed vs. variable costs - Explicit vs. implicit costs - Out of pocket vs. inputted costs – Break even analysis (BEA) - Determination of break even point (Simple problems).

UNIT – III

INTRODUCTION TO MARKETS AND PRICING :

Market Structure: Types of Markets - Features of perfect competition - Monopoly and monopolistic competition - Price and output determination in perfect competition and monopoly.

Pricing : Objectives and policies of pricing – Sealed bid pricing - Marginal cost pricing - Cost plus pricing - Going rate pricing - Limit pricing - Market penetration - Market skimming - Block pricing – Bundling - Peak load pricing - Cross subsidization - Dual pricing - Administrated pricing.

UNIT – IV

BUSINESS AND NEW ECONOMIC ENVIRONMENT : Characteristic features of business - Features and evolution of sole proprietorship - Partnership - Joint stock company - New economic policy 1991.

UNIT – V

INTRODUCTION AND PRINCIPLES OF ACCOUNTING:

Accountancy : Introduction – Concepts – Conventions – Accounting principles - Double entry book keeping – Journal – Ledger - Trial balance (Simple problems).

UNIT – VI

FINAL ACCOUNTS : Introduction to final accounts - Trading account - Profit and loss account and balance sheet with simple adjustments (Simple problems).

UNIT – VII

CAPITAL AND CAPITAL BUDGETING :

Capital : Significance - Types of capital.

Capital Budgeting : Nature and scope of capital budgeting - Features and methods of capital budgeting – Pay back period method - Accounting rate of return method - Internal rate of return method - Net present value method and profitability index (Simple problems).

UNIT – VIII

COMPUTERIZATION OF ACCOUNTANCY SYSTEM : Manual accounting vs. computerized accounting – Advantages and disadvantages of computerized account – Using accounting software **Tally :** Tally features – Company creation – Account groups – Group creation – Ledger creation**.**

TEXT BOOKS

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3rd Edition, Tata Mc-Graw Hill, New Delhi, 2007.
2. R.Cauvery, U.K. Sudhanayak, M. Girija and R. Meenakshi, *Managerial Economics*, 1st Edition, S. Chand and Company, New Delhi, 1997.

REFERENCES

1. Samba Lalita, *Computer Accounting Lab work,* 1st Edition, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics,* 19th Edition, Sultan Chand and Sons, New Delhi, 2005.
3. H. Craig Petersen and W. Cris Levis, *Managerial Economics,* 4th Edition, Pearson Education, 2009.
4. Lipsy and Chrystel, *Economics,* 4th Edition, Oxford University Press, New Delhi, 2008.
5. S.N. Maheswari and S.K. Maheswari, *Financial Accounting*, 4th Edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting*, 5th Edition, Kalyani Publishers, Ludhiana, 2000.

III B.Tech. I Semester

10BT50101 **: STRUCTURAL ANALYSIS – II**

L	T	P	C
4	1	-	4

UNIT-I

MOVING LOADS : Maximum SF and BM at a given section and absolute maximum SF and BM due to single concentrated load, UDL longer than the span, UDL shorter than the span, two point loads and several point loads – Equivalent uniformly distributed load – Focal length.

UNIT-II

INFLUENCE LINES : Influence line for support reaction, shear force and bending moment – Load position for maximum SF and for maximum BM at a section – Point loads, UDL longer than the span, UDL shorter than the span – Influence lines for forces in members of Pratt and Warren trusses.

UNIT-III

MOMENT DISTRIBUTION METHOD : Basic concepts - Stiffness factor – Carry over factor - Application to continuous beams with and without settlement of supports.

UNIT IV

SLOPE–DEFLECTION METHOD : Basic concepts - Slope deflection equation - Application to continuous beams with and without settlement of supports.

UNIT–V

KANI'S METHOD : Analysis of continuous beams including settlement of supports - Single bay, single storey portal frames without side sway.

UNIT-VI

ENERGY METHOD : Strain in linear elastic system - Expression of strain energy due to axial load, bending moment and shear forces – Castigliano's first theorem – Deflections of simple beams and pin jointed plane trusses.

UNIT-VII

REDUNDANT PIN-JOINTED FRAMES : Introduction to indeterminate frames – Static and kinematic indeterminacies – Castigliano's theorem – Analysis of pin-jointed frames with upto two degrees of internal and external indeterminacies.

UNIT – VIII

MULTI STOREY FRAMES (Approximate Methods) : Substitute frame method (Two cycle method) for gravity loads – Portal method and cantilever method for lateral loads.

TEXT BOOKS

1. R.S.Khurmi, *Theory of Structures,* 11th Edition, S.Chand Publications, New Delhi, 1987.
2. V.N. Vazirani, M.M.Ratwani and S.K.Duggal, *Analysis of Structures - Vol.II,* 16th Edition, Khanna Publications, New Delhi, 2011.

REFERENCES

1. H.J.Shah and S.B.Junnarkar, *Mechanics of Structures – Vol. II,* 21st Edition, Charotar Publishing House, Anand, Gujrat, 2010.
2. Pandit, G., Gupta, S. and Gupta.R., *Theory of Structures – Vol. II,* 1st Edition, Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi, 1999.
3. Punmia, B. C., Ashok Kumar Jain and Arun Kumar Jain, *SMTS–II - Theory of Structures,* 12th Edition, Laxmi Publications (P) Ltd**,** New Delhi, 2004*.*
4. Ramamrutham, S. and Narayanan, R., *Theory of Structures,* 9th Edition, Dhanpat Rai Publishing Co. Ltd., New Delhi, 2010.

III B.Tech. I Semester

10BT50102 **: REINFORCED CEMENT CONCRETE STRUCTURES - II**

L	T	P	C
4	1	-	4

UNIT-I
STAIRCASES : Types of staircases - Stairs spanning longitudinally and transversally.

UNIT-II
FOUNDATIONS : Combined footings - Strap footing - Raft foundations.

UNIT-III
PILE FOUNDATIONS : Design of piles and pile caps – Underreamed piles – Grade beams

UNIT-IV
RETAINING WALLS : Lateral earth pressure - Design of cantilever and counter fort retaining walls.

UNIT-V
DOMES : Circular domes – Stresses - Membrane theory - Design.

UNIT-VI
WATER TANKS-I : Design of members in tension - Minimum steel areas and covers - Design of circular water tanks resting on ground.

UNIT VII
WATER TANKS-II : Design of underground water tanks – Overhead water tanks – Circular beams.

UNIT-VIII
PRESTRESSED CONCRETE : Introduction to prestressing - Materials - Types of prestressing – Loss of prestress – Pretensioning and posttensioning - Design of simple beams.

TEXT BOOKS

1. S. Unnikrishna Pillai and Devdas Menon, *Reinforced Concrete Design,* 3nd Edition, Tata Mc.Graw Hill, New Delhi, 2010.
2. N.C. Sinha and S.K. Roy, *Fundamentals of Reinforced Concrete,* 5th Edition, S. Chand Publishers, 2010.

REFERENCES

1. Limit State Designe of Reinforced Concrete, P.C. Varghese, Prentice Hall of India, New Delhi, 2nd Edition, 2010.
2. Reinforced Concrete Structures - Vol. I and Vol.II, B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, Publications Pvt. Ltd., New Delhi, 19th Edition, 2010.
3. Reinforced Concrete Design, N. Krishna Raju and R.N. Pranesh, CBS Publishers Distributors, New Delhi, 3rd Edition, 2010.
4. Prestressed Concrete, N. Rajagopalan, Narosa Publishing House, New Delhi, 2nd Edition, 2008.

Codes: IS 456-2000 and IS 1343-1980 code books are to be permitted into the examination hall.

III B.Tech. I Semester

10BT50103 **: ENGINEERING HYDROLOGY**

L	T	P	C
4	-	-	4

UNIT – I
INTRODUCTION TO HYDROLOGY : Definition and scope of hydrology – Hydrologic cycle – Practical applications and historical development – Precipitation – Types and forms of precipitation – Weather and seasons in India.

UNIT – II
PRECIPITATION : Measurement of rainfall – Recording and non-recording type of rain gauges – Errors in measurement – Analysis and interpretation of rain fall data – Mass curve of rainfall – Hyetograph – Double mass curve - Methods of calculation of mean precipitation over an area – Depth-Area-Duration relationships.

UNIT – III
EVAPORATION AND EVAPOTRANSPIRATION : Process – Factors affecting evaporation – Estimation – Methods of reduction.
Infiltration : Definition – Factors affecting infiltration – Infiltration equation and indices – Measurement.
Streamflow : Measurement of discharge – Area velocity method – Moving boat method.

UNIT – IV
RUNOFF : Components – Factors affecting runoff – Rainfall-Runoff relationships – Flow mass curve, Flow duration curves.

UNIT – V
HYDROGRAPHIC ANALYSIS : Components of Hydrograph – Unit Hydrograph – Derivation – Use and limitation of unit hydrograph.

UNIT – VI
DESIGN FLOOD : Methods – envelope curves – Empirical formulae – Rational method – Unit hydrograph method – Frequency analysis – Flood routing.

UNIT – VII
GROUNDWATER HYDROLOGY : Introduction – Forms of subsurface water – Classification of formations – Aquifer characteristics – Porosity – Specific yield.

UNIT – VIII

WELLS : Types of wells – Draw down – Discharge of flow operating in unconfined aquifer – Discharge of flow operating in a confined aquifer – Pumping test – Recuperation test for open wells.

TEXT BOOKS

1. K. Subramanya, *Engineering Hydrology,* 3rd Edition, Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2011.
2. P. Jaya Rami Reddy, *A Text book of Hydrology,* 3rd Edition, University Press, Laxmi Publications, New Delhi, 2011.

REFERENCES

1. H.M. Raghunath, *Ground Water,* 3rd Edition, Wiley Eastern Ltd., New Delhi, 2009.
2. David Keith Todd, *Ground Water Hydrology,* 2nd Edition, Wiley India Pvt. Ltd., New Delhi, 2010.
3. V.T. Chow., *Hand Book of Applied Hydrology,* 2ndEdition, Mc Graw-Hill Education Pvt.Ltd., New Delhi, 2000.

III B.Tech. I Semester

10BT50104 **: SOIL MECHANICS**

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION : Soil formation - Types of soils – Soil structure and clay mineralogy – Adsorbed water – Volume-weight relationships - Three-phase diagram.

UNIT – II

INDEX PROPERTIES OF SOILS : Moisture content - Specific gravity – In-situ density - Relative density- Grain size analysis – Sieve and hydrometer methods – Plasticity of soils - Consistency limits and indices – I.S. Classification of soils – Sensitivity – Thixotropy - Activity of soils.

UNIT –III

PERMEABILITY : Soil water – Capillary rise – Flow of water through soils – Darcy's law - Permeability – Factors affecting permeability – Laboratory determination of coefficient of permeability – Permeability of layered systems.

UNIT –IV

SEEPAGE THROUGH SOILS : Effective stress principle - Effective stress under different loading conditions - Seepage pressure **-** Quicksand condition – Seepage through soils – Flownets: Characteristics and Uses - Seepage through earth dams with horizontal filter - Critical hydraulic gradient.

UNIT – V

STRESS DISTRIBUTION IN SOILS : Boussinesq's and Westergaard's theories for point loads and areas of different shapes – Newmark's influence chart – Approximate methods – Contact pressure distribution.

UNIT – VI

COMPACTION : Mechanism of compaction - Optimum moisture content and maximum dry density - Factors affecting compaction - Effects of compaction on soil properties - Laboratory determination of OMC and MDD - Field compaction methods - Compaction control.

UNIT – VII

CONSOLIDATION OF SOILS : Initial, primary and secondary consolidation - Spring analogy for primary consolidation - Consolidation test - e-p and e-log p curves - Terzaghi's theory of one dimensional consolidation - Coefficient of consolidation – Preconsolidation pressure – Secondary consolidation.

UNIT – VIII

SHEAR STRENGTH OF SOILS : Mohr-Coulomb failure theories – Types of laboratory shear strength tests – Strength tests based on drainage conditions and their field applicability – Shear strength of cohesionless soils – Critical void ratio – Liquefaction - Shear strength of cohesive soils.

TEXT BOOKS

1. Gopal Ranjan and ASR Rao, *Basic and Applied Soil Mechanics,* 2nd Revised Edition, New age International Pvt . Ltd, New Delhi, 2010.
2. K.R. Arora, *Soil Mechanics and Foundation Engineering,* 7th Edition,Standard Publishers and Distributors, New Delhi, 2010.

REFERENCES

1. Braja.M.Das, *Text Book of Geotechnical Engineering,* 1st Edition, Cengage Learning India, New Delhi, 2009.
2. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Soil Mechanics and Foundation,* 16th Edition, Laxmi Publications Pvt. Ltd., New Delhi, 2005.
3. C. Venkatramaiah, *Geotechnical Engineering,* 3rd Edition,New Age International Publishers, New Delhi, 2010.
4. V. N. S. Murthy, *Text Book of Soil Mechanics and Foundation Engineering,* 3rd Edition, CBS Publishers & Distributors (P) Ltd., New Delhi, 2010.

III B.Tech. I Semester

10BT50105 **: ENGINEERING GEOLOGY**

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION : Importance of geology from civil engineering point of view – Brief study of case histories of failure of some civil engineering constructions due to geological draw backs – Importance of physical geology, petrology and structural geology; Weathering: Effects of weathering of rocks – Importance of weathering with reference to dams, reservoirs and tunnels.

UNIT – II

MINERALOGY : Definition of mineral – Importance of study of minerals – Different methods of study of minerals– Advantages of study of minerals by physical properties - Identification of minerals – Physical properties of common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite – Study of other common economic minerals such as Pyrite, Hematite, Magnetite, Galena, Pyrolusite, Graphite, Magnesite and Bauxite.

UNIT – III

PETROLOGY : Definition of rock – Geological classification of rocks into igneous, sedimentary and metamorphic rocks –Dykes and sills - Common structures, textures – Features of igneous, sedimentary and metamorphic rocks – Megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT – IV

STRUCTURAL GEOLOGY : Out crop - Strike and dip – Classification and recognition of folds, faults, unconformities, and joints – Their importance in-situ – Foliation and lineation – Concept of stress and strain, analysis of stress and response of rock to stress – Analysis of deformation and strain ellipsoid – Common types of soils, their origin and occurrence in India.

UNIT – V

GROUNDWATER, EARTHQUAKE AND LANDSLIDES : Groundwater – Water table – Common types of groundwater – Springs – Cone of depression – Geological controls of groundwater movement – Groundwater exploration – Hydrological properties of rocks: porosity, permeability, storativity, specific yield and specific retention

Earthquakes, their causes and effects - shield areas and seismic zones – Seismic waves - Richter scale - Precautions to be taken for building construction in seismic areas – Landslides, their causes and effect - Measures to be taken to prevent their occurrence.

UNIT – VI

GEOPHYSICAL STUDIES : Importance of geophysical studies - Principles of geophysical study by gravity methods –Magnetic methods – Electrical resistivity methods – well logging and interpretation – Seismic refraction methods – Radiometric methods and geothermal method – Special importance of electrical resistivity methods and seismic refraction methods.

UNIT – VII

GEOLOGY OF DAMS AND RESERVOIRS : Types of dams – Geological considerations in the selection of a dam site – Analysis of dam failures of the past – Factors contributing to the success of a reservoir.

UNIT – VIII

TUNNELS : Purposes of tunneling – Effects of tunneling on the ground – Geological considerations (i.e., Tithological, structural and groundwater) in tunneling, over break and lining in tunnels.

TEXT BOOKS

1. N.Chennkesavulu, *Engineering Geology,* 2nd Edition, Mc-Millan India Ltd., New Delhi, 2011.
2. D. Venkata Reddy, *Engineering Geology,* 1st Edition, Vikas Publications, New Delhi, 2010.

REFERENCES

1. K.V.G.K. Gokhale, *Principles of Engineering Geology,* 1st Edition, B.S. Publications, Hyderabad, 2005.
2. Parbin Singh, *A Text Book of Engineering and General Geology,* 8th Edition, S.K. Kataria and Sons, New Delhi, 2010.
3. Krynine and Judd, *Principles of Engineering Geology and Geotechnics,* 1st Edition, CBS Publishers and Distributors, 2005.
4. Mukarjee, *Engineering Geology,* 11th Edition, World Press Pvt. Ltd., Calcutta, 2010.

III B.Tech. I Semester

10BT50111 **: COMPUTER AIDED BUILDING DRAWING**

L	T	P	C
-	-	3	2

SOFTWARE: AUTOCAD

LIST OF EXERCISES

1. Buildings with load bearing walls (Flat and pitched roof) – Including details of doors and windows
2. RCC framed structures
3. Industrial buildings – North light roof trusses
4. Perspective view of one and two storey buildings

TEXT BOOKS

1. Varma B.P., *Civil Engineering Drawing and House Planning,* 10th Edition, Khanna Publishers, Delhi, 1992.
2. Balagopal and T.S. Prabhu, *Building Drawing and Detailing,* Spades Publishers, Calicut, 1987.

REFERENCES

1. Shah, M.G., *Building Drawing,* Tata McGraw-Hill, New Delhi, 1992.
2. Kumaraswamy N. and Kameswara Rao A., *Building Planning and Drawing,* 4th Edition, Charotar Publishing, 2010.
3. Kale and Patki, Shah, *Building Drawing with Integrated Approach To Built Environment,* Tata McGraw-Hill, New Delhi, 2002.

III B.Tech. I Semester

10BT50112 **: ENGINEERING GEOLOGY LAB**

L	T	P	C
-	-	3	2

LIST OF EXERCISES

1. Study of physical properties and identification of rock forming minerals.
2. Study of physical properties and identification of ore forming minerals.
3. Megascopic identification of common igneous rocks.
4. Megascopic identification of common sedimentary rocks.
5. Megascopic identification of common metamorphic rocks.
6. Interpretation and drawing of sections for geological maps showing tilted beds, faults, unconformities etc.
7. Simple structural geology problems.

III B.Tech. I Semester

10BT4HS02 **: ADVANCED ENGLISH COMMUNICATION SKILLS (Audit Course)**

L	T	P	C
-	3	-	-

UNIT - I

VOCABULARY BUILDING : Synonyms and antonyms - Word roots - One-word substitutes - Prefixes and suffixes - Study of word origin - Analogy, idioms and phrases.

FUNCTIONAL ENGLISH : Starting conversation - Responding appropriately and relevantly - Using the right body language - Role play in different situations.

UNIT - II

READING COMPREHENSION : Reading for facts - Guessing meanings from context - Scanning, skimming, inferring meaning and critical reading.

UNIT - III

ACADEMIC ESSAY WRITING : Accuracy, brevity, clarity, brainstorm - List your ideas - Sub-headings - Revising content and organisation.

UNIT - IV

TECHNICAL REPORT WRITING : Types of formats and styles - Subject-matter - Subject-organization - Clarity, coherence and style - Planning - Data-collection - Tools - Analysis.

UNIT - V

CAREER SKILLS : Career direction - Exploring your talents - Personality inventories - Write a "Who I Am" statement - Thinking further - Perform career research - How do I get hired - Creating job satisfaction - Identify your satisfaction triggers - Positive attitude - Maintain a balanced lifestyle - Analyze your job in terms of your interests - Set goals to bring your interests and responsibilities in line - Personal SWOT analysis - Making the most of your talents and opportunities - Shaping your job to fit you better - Future proof your career - Managing your emotions

UNIT - VI

RESUME WRITING: Structure and presentation - Planning - Defining the career objective - Projecting ones strengths and skill-sets - Summary - Formats and styles - Cover letter.at work - Get the recognition you deserve.

UNIT - VII

GROUP DISCUSSION: Dynamics of group discussion - Intervention- Summarizing - Modulation of voice - Fluency and coherence - Participation, relevance, assertiveness, eye contact and body language.

UNIT - VIII

INTERVIEW SKILLS: Concept and process - Pre-interview planning- Opening strategies - Answering strategies - Interview through tele and video-conferencing.

REFERENCES

1. M. Ashraf Rizvi, *Effective Technical Communication Skills,* Tata McGraw-Hill, New Delhi, 2005.
2. Meenakshi Raman and Sangetha Sharma, *Technical Communication - Principles and Practice*, Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, *Secrets of Success in Interviews*, Crucial Books, Secunderabad, 2007.
4. M. Ashraf Rizvi, *Resumes and Interviews - The Art of Wining*, Tata McGraw-Hill, New Delhi, 2008.
5. Gopala Swamy Ramesh and Mahadevan Ramesh, *The Ace of Soft Skills: Attitude, Communication and Etiquette for Success*, Pearson Education, New Delhi, 2009.

SUGGESTED SOFTWARE

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.

III B.Tech. II Semester

10BT60101 **: ESTIMATION AND QUANTITY SURVEYING**

L	T	P	C
4	-	-	4

UNIT – I

GENERAL ITEMS OF WORK IN BUILDING : Standard Units Principles of working out quantities for detailed and abstract estimates – Calculation of quantities of brick work, RCC, PCC, Plastering, whitewashing, colourwashing and painting/varnishing for shops, rooms, residential building with flat and pitched roof – Approximate method of estimating.

UNIT – II

DETAILED ESTIMATES OF BUILDINGS : Different items of works in building – Principles of taking out quantities – Detailed measurement form – Estimate of RCC building - Long walls - Short wall method and Centre line method – Various types of arches – Calculation of brick work and RCC works in arches.

UNIT – III

ROADS AND CANALS :

Roads: Estimate of bituminous and cement concrete - Estimate of earthwork - Estimate of pitching of slopes - Estimate of earthwork of road from longitudinal sections - Estimate of earthwork in hill roads.

Canals: Earthwork in canals – Different cases – Estimate of earthwork in irrigation channels.

UNIT – IV

RATE ANALYSIS : Working out data for various items of work overhead and contigent charges - Task or out – Turn work - Labour and materials required for different works - Rates of materials and labour - Schedule of Rates - Preparing analysis of rates for the following items of work: Concrete, RCC Works, Brick work in foundation and super structure, plastering, CC flooring, whitewashing.

UNIT-V

REINFORCEMENT BAR SCHEDULE : Reinforcement bar bending and bar requirement schedules.

UNIT – VI

CONTRACTS AND TENDERS : Contracts: Elements of contract- offer acceptance and consideration - Valid contract - Types of contracts – Lumpsum contract, schedule contract, item rate contract, sub-contracts, joint ventures - Departmental execution of works - Muster Roll Form 21 - Piece work agreement form - Work order.

Tenders: Contract contractor – Quotation - Earnest money - Security money – Tender - Tender notice, tender form - Bidding procedure, irregularities in bidding – Bidding award - Arbitration disputes and claim settlement.

UNIT – VII

VALUATION OF BUILDINGS: Necessity - Different terms used in valuation and their meaning - Different methods of building valuation and rent fixation - Outgoings – Depreciation - Methods for estimating cost depreciation – Escalation.

UNIT – VIII

SPECIFICATIONS: Purpose and method of writing specifications - General specifications - Detailed specifications for different items of building construction.

TEXT BOOKS

1. B.N. Dutta, *Estimating and Costing,* UBS publishers, New Delhi, 2000.
2. G.S. Birdie, *Estimating and Costing,* Danpatrai Publications, New Delhi, 2009.

REFERENCES

1. M. Chakraborthi, *Estimating Costing Specification and Valuation in Civil Engineering,* 23rd Edition, Laxmi Publications, New Delhi, 2010.
2. Standard Schedule of Rates and Standard Data Book, Public Works Department.
3. IS 1200 (Parts I to XXV–1974/ Method of Measurement of Building and Civil Engineering Works – B.I.S.)
4. National Building Code of India – 2010, BIS, Govt. of India, New Delhi.

III B.Tech. II Semester

10BT60102 **: STEEL STRUCTURES - I**

L	T	P	C
4	1	-	4

UNIT-I

DESIGN CONCEPTS : Types of rolled steel sections – Stress-strain relationship for mild steel – Loads – Design concepts of steel structures – Working stress design – Limit state design – Design requirements – Design strength – Serviceability limit state.

By Limit State Method: [IS 800-2007]

UNIT–II

RIVETED AND BOLTED CONNECTIONS : Failure of a joint - Strength and efficiency of a joint - Lap Joint - Butt joint - Eccentric connections.

UNIT - III

WELDED CONNECTIONS : Strength of welds - Butt and fillet welds - Design of fillet welds subjected to axial load - Design of fillet welds subjected to moment acting in the plane and at right angles to the plane of the joints - Beam to beam and beam to column connections.

UNIT–IV

TENSION MEMBERS : Net effective sectional area for angle and tee sections - Design of tension members - Lug angles.

UNIT-V

BEAMS : Bending, shear and bearing strength – Design of simple beams - Design of plated beams - Design of connection of cover plates with the flanges of beams.

UNIT-VI

COMPRESSION MEMBERS : Effective length, radius of gyration and slenderness of compression members - Design strength - Design of axially loaded compression members.

UNIT –VII

BUILT-UP COMPRESSION MEMBERS : Design of built-up compression members - Design of lacings and battens - Design principles of eccentrically loaded columns - Splicing of columns.

UNIT – VIII

DESIGN OF COLUMN FOUNDATIONS : Design of slab base and gusseted bases - Column bases subjected moment.

TEXT BOOKS

1. S.K. Duggal, *Design of steel structures,* 1st Edition, Tata McGraw Hill, New Delhi, 2010
2. N. Subramanian, *Design of steel structures,* 1st Edition, Oxford University Press, 2010

REFERENCES

1. S.S. Bhavikatti, *Design of Steel Structures,* 2nd Edition, I.K. International Publishing House Pvt. Ltd, 2010.
2. N. Krishna Raju, *Structural Design and Drawing,* 3rd Edition, Universities Press, Hyderabad, 2009.
3. Ramachandra and Virendra Gehlot, *Design of Steel Structures,* 11th Edition, Scientific Publishers, Jodhpur, 2005.
4. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Design of Steel Structures,* 2nd Edition, Laxmi Publications, New Delhi, 1998.

IS Codes: IS -800 – 2007, IS – 875 – Part III and Steel Tables are to be permitted into the examination hall.

III B.Tech. II Semester

10BT60103 **: WATER RESOURCES ENGINEERING**

L	T	P	C
4	1	-	4

UNIT – I

IRRIGATION : Necessity and importance– Advantages and Disadvantages – Types of Irrigation – Application of irrigation water – Indian agricultural soils – Methods of increasing soil fertility – Standards for irrigation water.

UNIT – II

SOIL MOISTURE : Soil-Water-Plant relationship – Vertical distribution of soil moisture – Soil moisture constants – Consumptive use – Duty-Delta relationship **-** Factors affecting duty – Irrigation efficiency.

UNIT – III

DIVERSION HEAD WORKS : Types of diversion head works – Weirs – Barrages – Layout of diversion works – Causes and failure of hydraulic structures on permeable foundations – Bligh's creep theory – Khosla's theory – Determination of uplift pressure – Impervious floors – Exit gradient – Functions of upstream and downstream sheet piles.

UNIT – IV

DAMS : Types of dams – Merits and demerits – Factors affecting selection of site – Zones of storage of reservoir – Estimation of reservoir capacity – Mass curve.

UNIT – V

GRAVITY DAMS : Forces acting on gravity dam - Causes of failure of gravity dams – Elementary profile and practical profile of gravity dam – Limiting height of a low gravity dam – Stability analysis – Drainage galleries.

UNIT – VI

EARTH DAMS : Types – Causes of failure – Criteria for safe design - Seepage through earth dam – Measures of seepage control.

UNIT – VII

CANAL STRUCTURES : Types of falls – Canal regulation works – Canal outlets.

UNIT – VIII

CROSS DRAINAGE WORKS : Types – Selection of site aqueducts - Super passages – Level crossing.

TEXT BOOKS

1. S.K. Garg, *Irrigation Engineering and Hydraulic Structures,* 23rd Edition, Khanna Publishers, New Delhi, 2010.
2. B.C. Punmia and P.B.B. Lal, *Irrigation and Water Power Engineering,* 16th Edition, Laxmi Publications, New Delhi, 2011.
3. R.K. Sharma and T.K. Sharma, *Irrigation Engineering,* 3rd Edition, S. Chand Publishers, New Delhi, 2007.

REFERENCES

1. K.R. Arora, *Irrigation, Water Power and Water Resources Engineering,* 4th Edition, Standard Publishers Distributers, Delhi, 2011.
2. G.L. Asawa, *Irrigation and Water Resources Engineering.*

III B.Tech. II Semester

10BT60104 **: ENVIRONMENTAL ENGINEERING - I**

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION : Importance of water supply Engineering - Need for protected water supply – Objective of water supply systems – Flow diagram of water supply systems.

UNIT – II

SOURCES AND DEMAND OF WATER : Different sources of water **–** Quantity and quality of different sources – Types and variation in water demand – Factors affecting water demand – Design period – Forecasting of population, different methods and their suitability.

UNIT – III

WATER COLLECTION, CONVEYANCE AND DISTRIBUTION : Intake works for collection of surface water – Conveyance of water – Gravity and pumping methods – Different materials used for conveying conduits and their suitability – Systems of distribution – Distribution reservoirs – Distribution networks – Design of simple networks – Pipe accessories – Valves and their location and suitability.

UNIT – IV

QUALITY REQUIREMENTS OF WATER : Sources of water pollution – Water borne diseases – Physical, chemical and biological impurities – Tests conducted for determining impurities – Water standards for different uses - Water quality standards WHO.

UNIT – V

WATER TREATMENT – I : Conventional water treatment processes units and their functions - Theory and design of aeration, coagulation, flocculation, and clarification - Determination of optimum dose of alum for coagulation of water.

UNIT – VI

WATER TREATMENT – II : Theory of filtration – Different types of filters and their design - Disinfection – Disinfectants – Mechanism of disinfection – Different methods of disinfection – Break point chlorination – Types chlorination – Dose of disinfectant.

UNIT – VII

ADVANCED TREATMENT METHODS : Removal of fluorides, arsenic, hardness, iron and manganese, salinity, colour, organic chemical and biological residues, Removal of Persistant Organic Pollutants – Adsorption with activated carbon, ion-exchange resins, membrane processes, chemical oxidation and softening.

UNIT – VIII

WATER SUPPLY ARRANGEMENTS IN BUILDINGS : Definition of technical terms used in water supply arrangements – Identification of different water supply of pipes – General layout of water supply in single storey and multi storeyed buildings - Principles and precautions in laying pipe lines in the premises of buildings - Connection from water main to building – Water supply fittings – Detection and prevention of leakage.

TEXT BOOKS

1. G.S. Birdie and J. S. Birdie, *Water Supply and Sanitary Engineering*, 8th Edition, Dhanpat Rai and Sons Publishers, New Delhi, 2010.
2. S.K. Garg, *Environmental Engineering (Vol.I): Water Supply Engineering*, 20th Revised Edition, Khanna Publishers, New Delhi, 2011.

REFERENCES

1. K.N. Duggal, *Elements of Environmental Engineering*, 1st Edition, S.Chand Publishers, New Delhi, 2010.
2. Nazih K. Shammas and Lawrence K. Wang, *Fair, Geyer and Okun's Water and Waste Water Engineering: Water Supply and Wastewater Removal*, 3rd Edition, John Wiley and Sons, New Delhi, 2011.
3. H.S. Peavy and D.R.Rowe, *Environmental Engineering*, 1st Edition, McGraw-Hill Publishing Company, New York, 1984.

III B.Tech. II Semester

10BT60105 **: TRANSPORTATION ENGINEERING**

L	T	P	C
4	-	-	4

UNIT I

HIGHWAY DEVELOPMENT AND PLANNING : Highway development in India – Necessity for highway planning - Different road development plans - Classification of roads - Road network patterns – Highway alignment - Factors affecting alignment - Engineering surveys – Drawings and reports.

UNIT – II

HIGHWAY GEOMETRIC DESIGN : Importance of geometric design - Design controls and criteria- Highway crosssection elements- sight distance elements - Stopping sight distance, overtaking sight distance and intermediate sight distance - Design of horizontal alignment - Design of super elevation and extra widening - Design of transition curves - Design of vertical alignment – Gradients - Vertical curves.

UNIT – III

HIGHWAY MATERIALS : Aggregates and bitumen – Desirable properties – Laboratory tests on aggregate and bitumen, CBR test – Specifications – Aggregate bitumen mixes – Desirable properties – Mix design by Marshal method – Cement and cement concrete.

UNIT – IV

PAVEMENT DESIGN : Types of pavements – Difference between flexible and rigid pavements – Pavement components – Sub grade, sub base, base and wearing course – Functions of pavement components – Design factors – Flexible pavement design methods – G.I method, CBR method, Triaxial method – Numerical examples – Design of rigid pavements – Critical load positions – Westergaard's stress equations – Computing radius of relative stiffness and equivalent radius of resisting section – Stresses in rigid pavements – Design of expansion and contraction joints in CC pavements. Design of dowel bars and tie bars.

UNIT – V

HIGHWAY DRAINAGE : Importance of highway drainage – Requirements – Surface drainage – Subsurface drainage – Drainage of slopes and erosion control – Road construction in water logged areas and black cotton soils.

UNIT – VI

RAILWAY ENGINEERING : Permanent way components – Cross section of permanent way - Functions of various components like rails, sleepers and ballast –Rail fastenings – Creep of rails - Theories related to creep – Adzing of sleepers - Sleeper density.

UNIT – VII

GEOMETRIC DESIGN OF RAILWAY TRACK : Gradients - Grade compensation - Cant and negative super elevation - Cant deficiency – Degree of curve – Crossings and turn out .

UNIT – VIII

AIRPORT ENGINEERING : Factors affecting selection of site for airport – Aircraft characteristics - Geometric design of runway - Computation of runway length – Correction for runway length – Orientation of runway – Wind rose diagram – Runway lighting system.

TEXT BOOKS

1. S.K. Khanna and C.E.G.Justo, *Highway Engineering,* 8th Edition, Nemchand and Brothers, Roorkee, 2009.
2. S.P. Saxena, S.P. Arora, *Railway Engineering - A Text Book of Transportation Engineering,* 7th Edition, S.Chand and Co. Ltd., 2010.
3. L.R. Kadiyali and Lal, *Highway Engineering Design,* 5th Edition, Khanna Publications, New Delhi, 2009.
4. S.K. Khanna and Arora, *Airport Planning and Design,* 6h Edition, Nemchand and Brothers, Roorkee, 2009.

REFERENCES

1. S.P.Bindra, *Highway Engineering,* 4th Edition, Dhanpat Rai and Sons, New Delhi, 2011.
2. L.R.Kadyali, *Traffic Engineering and Transportation Planning,* 7th Edition, Khanna Publications, 2010.
3. M. M. Agarwal,*Railway Engineering,* 15th Edition, Prabha and Co., New Delhi, 1994.
4. Virendhra Kumar and Statish Chandhra, *Air Transportation Planning and Design,* 1st Edition, Galgotia Publishers, New Delhi, 1999.

III B.Tech. II Semester

10BT60106 **: FOUNDATION ENGINEERING**

L	T	P	C
4	-	-	4

UNIT – I

SOIL EXPLORATION : Need – Planning - Methods of soil exploration – Geophysical methods – Open excavation methods - Boring and sampling methods – Types of soil samples - Field tests: penetration tests, plate load test, in-situ vane shear test, pressure meter test – Observation of groundwater table - Borehole logging – Soil investigation report - Selection of foundation based on soil condition.

UNIT – II

LATERAL EARTH PRESSURE : Types of Earth Pressures – Plastic equilibrium in soils – Rankine's theory – Earth pressures in cohesionless and cohesive soils - Coloumb's wedge theory – Earth pressure on retaining walls of simple configurations - Graphical methods (Rebhann and Culmann) - Pressure on the wall due to single line load alone.

UNIT – III

EARTH RETAINING STRUCTURES : Types of retaining structures - Stability considerations of gravity and cantilever retaining walls - Proportioning of retaining walls - Cantilever sheet pile walls - Anchored bulk heads (free earth support method only).

UNIT – IV

STABILITY OF EARTH SLOPES : Infinite and finite earth slopes – Types of failures – Factor of safety of infinite slopes – Stability analysis of finite slopes: Swedish arc method, standard method of slices, Bishop's simplified method, Taylor's stability number - Stability of slopes of earth dams under different conditions - Improving stability of slopes.

UNIT – V

BEARING CAPACITY OF SHALLOW FOUNDATIONS : Types and choice of foundation - Depth of foundation - Types of shear failure – Safe bearing capacity – Terzaghi's, Meyerhof's, Skempton's and IS methods - Effect of groundwater table on bearing capacity.

UNIT – VI

ALLOWABLE BEARING PRESSURE : Bearing capacity from penetration tests - Allowable bearing pressure - Safe bearing capacity and settlement from plate load test – Presumptive bearing capacity – Allowable settlements of structures – Settlement analysis

UNIT – VII

PILE FOUNDATIONS : Types of piles – Factors influencing the selection of pile - Load carrying capacity of piles in granular and cohesive soils - Static and dynamic pile formulae – In-situ penetration tests - Pile load tests – Negative skin friction - Load carrying capacity of pile groups in sands and clays – Settlement of pile groups.

UNIT – VIII

CAISSONS AND WELL FOUNDATIONS : Types of caissons - Bearing capacity - Construction of caissons - Advantages and disadvantages of caisson foundations – Comparison of caisson types - Well foundations - Shape – Lateral stability - Terzaghi's analysis - Components of wells - Functions and design - Design criteria – Sinking of wells – Tilts and shifts.

TEXT BOOKS

1. K.R. Arora, *Soil Mechanics and Foundation Engineering*, 7th Edition, Standard Publishers and Distributors, New Delhi, 2010.
2. C. Venkatramaiah, *Geotechnical Engineering,* 3rd Edition, New Age International Publishers, New Delhi, 2010.

REFERENCES

1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Soil Mechanics and Foundation*, 16th Edition, Laxmi Publications Pvt. Ltd., New Delhi, 2005.
2. Gopal Ranjan and A.S.R. Rao, *Basic and Applied Soil Mechanics,* 2nd Revised Edition, New Age International Pvt. Ltd, New Delhi, 2010.
3. Braja M. Das, *Principles of Foundation Engineering,* 6th Edition, Cengage Learning India, New Delhi, 2007.
4. J.E. Bowles, *Foundation Analysis and Design*, 5th Edition, McGraw-Hill Publishing Company, New York, 2001.
5. W.C. Teng, *Foundation Design*, 1st Edition, Prentice Hall Inc., New Jersy, 1962.
6. V.N.S. Murthy, *Text Book of Soil Mechanics and Foundation Engineering*, 3rd Edition, CBS Publishers & Distributors (P) Ltd., New Delhi, 2010.

III B.Tech. II Semester

10BT60111 **: GEOTECHNICAL ENGINEERING LAB**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS

1. Tests for Atterberg's limits
2. Determination of field density - core cutter and sand replacement method
3. Grain size analysis
4. Permeability of soil - constant head test and variable head test
5. Compaction test
6. Relative density test
7. CBR test
8. Consolidation test
9. Unconfined compression test
10. Tri-axial compression test
11. Direct shear test.
12. Vane shear test

III B.Tech. II Semester

10BT60112 **: ENVIRONMENTAL ENGINEERING LAB**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS

1. Determination of pH and turbidity
2. Determination of conductivity and total dissolved solids.
3. Determination of alkalinity/acidity.
4. Determination of chlorides.
5. Determination and estimation of total solids, organic solids and inorganic solids.
6. Determination of iron.
7. Determination of dissolved oxygen.
8. Determination of nitrogen.
9. Determination of total phosphorous.
10. Determination of B.O.D
11. Determination of C.O.D
12. Determination of optimum coagulant dose.
13. Determination of chlorine demand.
14. Presumptive E - Coli test.

III B.Tech. II Semester

10BT60114 **: SPREADSHEET APPLICATIONS IN CIVIL ENGINEERING**
(AUDIT COURSE)

L	T	P	C
-	3	-	-

LIST OF EXERCISES

1. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources. Creating a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
2. Creating a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.
3. Design of singly reinforced beam
4. Design of doubly reinforced beam
5. Design of one-way slab
6. Design of two-way slab
7. Design of isolated footings
8. Analysis of frames
9. Design of surplus weir
10. Design of trapezoidal notch
11. Design of canal regulator
12. Design of sewer pipe

TEXT BOOKS

1. Sylvan Charles Bloch, *Excel for Engineers and Scientists in Geotechnical Engineering,* Wiley, 2002.
2. Craig T. Christy, *Engineering with the spreadsheet: structural engineering templates using Excel,* ASCE Publications, 2006.

REFERENCES

1. Thomas F. Wolff, *Spreadsheet Applications in Geotechnical Engineering,* 1st Edition, PWS Publishing Company, 1995.

IV B.Tech. I Semester

10BT70101 **: REMOTE SENSING AND GIS**

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION TO PHOTOGRAMMETRY : Principle and types of aerial photographs – stereoscopy – Map vs. Mosaic – Ground control – Parallax measurements for height – Determinations - Techniques of photo interpretation – Aerial and satellite photogrammetry.

UNIT – II

REMOTE SENSING – I : Basic concepts and foundation of remote sensing – Elements involved in remote sensing, electromagnetic spectrum – Spectral reflectance and spectral regions remote sensing terminology and units.

UNIT – III

REMOTE SENSING – II : Energy resources – Energy interactions with earth surface features and atmosphere – Resolution, sensors and satellite visual interpretation techniques – Basic elements – Converging evidence – Interpretation for terrain evaluation – Spectral properties of water bodies – Introduction to digital data analysis – Structure of digital image.

UNIT – IV

GEOGRAPHIC INFORMATION SYSTEM : Introduction to GIS – GIS definition and terminology – GIS categories – Components of GIS, fundamental operations of GIS – Land surveying – Global positioning system.

UNIT – V

TYPES OF DATA REPRESENTATION : Data collection and input overview – Data input and output – Keyboard entry and coordinate geometry procedure – Manual digitizing and scanning – Raster GIS – Vector GIS – File management, spatial data – Layer based GIS – Feature based GIS mapping, map projections.

UNIT – VI

GIS SPATIAL ANALYSIS : Computational analysis methods (CAM) – Visual analysis methods (VAM) – Data storage – Vector data storage – Attribute data storage – Overview of the data manipulation and analysis – Integrated analysis of the spatial and attribute data.

UNIT – VII

WATER RESOURCES APPLICATIONS - I : Land use/Land cover in water resources – Surface water mapping and inventory – Rainfall – Runoff relations and runoff potential indices of watersheds – Flood and drought impact assessment and monitoring – Watershed management for sustainable development and Watershed characteristics.

UNIT – VIII

WATER RESOURCES APPLICATIONS – II : Reservoir sedimentation – Fluvial Geomorphology – Water resources management and monitoring – Ground water targeting – Identification of sites for artificial recharge structures – Drainage Morphometry – Inland water quality survey and management – Water depth estimation and bathymetry.

TEXT BOOKS

1. B. Bhatta, *Remote Sensing and GIS*, 1st Edition, Oxford University Press, New Delhi, 2009.
2. M. Anji Reddi, *A Text Book of Remote Sensing and Geographical Information Systems*, 2nd Edition, B.S. Publications, Hyderabad, 2010.

REFERENCES

1. C.P. Lo Albert and K.W. Yong, *Concepts and Techniques of GIS*, 2nd Edition, Prentice Hall (India) Publications, 2010.
2. Narayana Panigrahi, *Geographical Information Science*, 1st Edition, University Press, New Delhi, 2008.
3. Peter A. Burragh and Rachael Mc Donnell, *Principles of Geographical Information Systems*, 2nd Edition, Oxford University Press, USA, 2005.

IV B.Tech. I Semester

10BT70102 **: ENVIRONMENTAL ENGINEERING - II**

L	T	P	C
4	-	-	4

UNIT – I

INTRODUCTION : Definition of terms – Sewage, sullage, refuse, garbage – Objectives of sewerage works systems of sewage collection and disposal – Conservancy systems – Water carriage systems – Merits and demerits - Sewerage systems – Combined, separate, partially separate and combined systems - Merits and demerits**.**

UNIT – II

QUANTITY OF SEWAGE : Estimation of quantity of municipal waste water – Estimation of quantity of storm water – Different types of sewers, design flows through sanitary sewers, storm sewers and combined sewers - Hydraulic design of sewers – Sewer appurtenances – House drainage and plumbing systems.

UNIT – III

CHARACTERSTICS OF SEWAGE : Sampling of sewage – Characteristics and composition of sewage – Physical, chemical and biological – Total solids – C.O.D – B.O.D – Equation and factors affecting the BOD rate of reaction – Population equivalent.

UNIT – IV

PRELIMINARY AND PRIMARY SEWAGE TREATMENT : Concept of waste water treatment, primary, secondary and tertiary treatment – Conventional treatment process flow diagrams of municipal wastewater treatment plants – Functions of each unit principles and design of screens, grit chamber, and primary setting tanks.

UNIT – V

SECONDARY TREATMENT OF SEWAGE : Principles of biological treatment, nutritional requirement of biological treatment systems, factors affecting biological treatment systems – Design, construction, operation and maintenance of trickling filter, activated sludge process - Oxidation ditch - Stabilization ponds.

UNIT – VI

SLUDGE MANAGEMENT : Quantity and characteristics and types of sludge - Sludge conditioning and dewatering - Handling, treatment, sludge utilization and disposal - Tertiary treatment – Removal of nitrogen, phosphorus, refractory organic, heavy metals, suspended solids and pathogenic bacteria.

UNIT – VII

EFFLUENT DISPOSAL : Standards for disposal – Disposal into surface water bodies – Self purification, zones of pollution – Dissolved oxygen sag curve – Streeter – Phelps equation, marine disposal – On land disposal and treatment systems – Overflow, flooding and irrigation. Onsite disposal systems – Septic tank and effluent disposal system.

UNIT – VIII

MUNICIPAL SOLID WASTE : Characteristics, generation, collection and transportation of solid wastes - Engineered systems for solid waste management – Reuse – Recycling – Energy recovery – Treatment and disposal.

TEXT BOOKS

1. G.S. Birdie and J. S. Birdie, *Water Supply and Sanitary Engineering*, 8th Edition, Dhanpat Rai and Sons Publishers, New Delhi, 2010.
2. P.N. Modi, *Sewage Treatment Disposal and Wastewater Engineering*, 3rd Edition, Standard Publishers Distributors, Delhi, 2011.

REFERENCES

1. S.K. Garg., *Environmental Engineering (Vol. II): Sewage Disposal and Air Pollution Engineering*, 22nd Edition, Khanna Publishers, New Delhi, 2010.
2. Met Calf and Eddy, *Wastewater Engineering*, 4th Edition, TMH Education Pvt. Ltd., New Delhi, 2010.
3. K.N. Duggal, *Elements of Environmental Engineering*, 1st Edition, S.Chand Publishers, New Delhi, 2010.
4. Nazih K. Shammas and Lawrence K. Wang, *Fair, Geyer and Okun's Water and Waste Water Engineering: Water Supply and Wastewater Removal*, 3rd Edition, John Wiley and Sons, New Delhi, 2011.

IV B.Tech. I Semester

10BT70103 **: STEEL STRUCTURES - II**

L	T	P	C
4	1	-	4

UNIT - I
RIVETED PLATE GIRDERS : Design of cross section - Curtailment of flange plates - Connection of flange angles to web and flange angles to flange plates - Design of vertical, horizontal and bearing stiffeners.

UNIT–II
WELDED PLATE GIRDERS : Design of cross section of plate girders - Design of vertical, horizontal and bearing stiffeners.

UNIT - III
ROOF TRUSSES : Different types of trusses – Design loads – Load combinations - IS Code recommendations - Structural details – Design of simple roof trusses involving the design of purlins, members and joints.

UNIT - IV
TUBULAR TRUSSES : Design of tension members, compression members and flexural members – Tubular trusses – Connections.

UNIT – V
GANTRY GIRDER : Gantry girder impact factors - Longitudinal forces - Design of gantry girders.

UNIT – VI
STEEL WATER TANKS : Specifications – Design of rectangular pressed steel tank – Design of staging.

UNIT –VII
STEEL - CONCRETE COMPOSITE CONSTRUCTION : Design principles – Shear connections – Composite beam design.

UNIT – VIII
PLASTIC ANALYSIS : Introduction to plastic analysis –Shape factor, plastic hinge, collapse loads for simply supported beams, propped cantilevers, and two span continuous beams - Design simple beams.

TEXT BOOKS

1. S.K. Duggal, *Design of Steel Structures,* 1st Edition, Tata McGraw Hill, New Delhi, 2010
2. N. Subramanian, *Design of Steel Structures,* 1st Edition, Oxford University Press, 2010

REFERENCES

1. S.S. Bhavikatti, *Design of Steel Structures,* 2ndEdition, I.K. International Publishing House Pvt. Ltd, 2010.
2. N. Krishna Raju, *Structural Design and Drawing,* 3rd Edition, Universities Press, Hyderabad, 2009.
3.. Ramachandra and Virendra Gehlot, *Design of Steel Structures,* 11th Edition, Scientific Publishers, Jodhpur, 2005.
4. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Design of Steel Structures,* 2nd Edition, Laxmi Publications, New Delhi, 1998.

IS Codes: IS -800 – 2007, IS – 875 – Part III and Steel Tables are to be permitted into the examination hall.

IV B.Tech. I Semester

10BT70104 **: TRAFFIC ENGINEERING AND MANAGEMENT**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO TRAFFIC ENGINEERING : Significance and scope - Characteristics of vehicles and road users - Skid resistance and braking efficiency (Problems) - Components of traffic engineering - Road, traffic and land use characteristics

TRAFFIC CHARACTERISTICS : Basic characteristics of traffic - Volume, speed and density - Relationship among traffic parameters.

UNIT-II

TRAFFIC MEASUREMENT : Traffic volume studies - Objectives - Types of volume studies – Concept of PCU- Data collection and presentation – Speed studies – Types of speeds - Objectives of speed studies - Methods of conducting speed studies - Data collection and presentation - Statistical methods for analysis of speed data - Origin and destination studies - Pedestrian studies - Basic principles of traffic flow.

UNIT-III

HIGHWAY CAPACITY : Definition of capacity – Importance of capacity – Factors affecting capacity - Concept of level of service - Different levels of service - Concept of service volume - Peak hour factor.

PARKING STUDIES : Types of parking facilities – On street and off street parking facilities - Parking studies - Parking inventory study – Parking survey by patrolling method - Analysis of parking data and parking characteristics - Multi storey car parking facility - Design standards.

UNIT-IV

TRAFFIC CONTROL AND REGULATION : Traffic problems in urban areas - Importance of traffic control and regulation - Traffic regulatory measures - Channelisation – Principle and design of intersections, grade separations and interchanges - Traffic signals – Saturation flow - Design of traffic signals and signal co-ordination (Problems) - Signal phasing and timing diagrams - Traffic control aids and street furniture, street lighting, computer applications in signal design.

UNIT-V

TRAFFIC AND ENVIRONMENT : Detrimental effect of traffic on environment – Air pollution – Pollutants due to traffic – Measures to reduce air pollution due to traffic - Noise pollution – Measures to reduce noise pollution.

UNIT-VI

TRAFFIC SIGNS AND ROAD MARKINGS : Types of traffic signs - Cautionary, regulatory and informative signs - Specifications - Pavement markings - Types of markings – Lane markings and object markings - Standards and specifications for road markings.

UNIT-VII

HIGHWAY SAFETY : Problem of highway safety – Types of road accidents - Causes – Engineering measures to reduce accidents- Enforcement measures – Educational measures - Road safety audit - Principles of road safety audit.

UNIT-VIII

TRAFFIC MANAGEMENT : Traffic management - Transportation system management (TSM) - Travel demand management (TDM) - Traffic forecasting techniques, restrictions on turning movements - Oneway Streets - Traffic segregation - Traffic calming - Tidal flow operations - Exclusive bus lanes - Introduction to intelligent transportation system (ITS).

TEXT BOOKS

1. Kadiyali L R, *Traffic Engineering and Transport Planning,* 7th Edition, Khanna Technical Publications, Delhi, 2010.
2. Khanna K and Justo C E G, *Highway Engineering,* 8th Edition, Nem Chand & Bros, Roorkee, 2009.

REFERENCES

1. *Indian Roads Congress (IRC) Specifications: Guidelines and Special Publications on Traffic Planning and Management.*
2. *Guidelines of Ministry of Road Transport and Highways,* Government of India.
3. Subhash C. Saxena, *A Course in Traffic Planning and Design,* Dhanpat Rai Publications, New Delhi, 1989.
4. C. Jotin Khisty and B.Kent Lall, *Transportation Engineering – An Introduction,* Prentice Hall of India Pvt. Ltd., 2006.
5. Partha Chakroborthy and Animesh Das, *Principles of Transportation Engineering,* Prentice Hall of India Pvt. Ltd, New Delhi.
6. C.S. Papacostas and P.D. Prevedouros, *Transportation Engineering and Planning,* Prentice Hall of India Pvt. Ltd., 2006.
7. Mannering and Kilareski, *Highway Engineering and Traffic Analysis,* John Wiley Publications.

IV B.Tech. I Semester

10BT70105 **: ADVANCED STRUCTURAL ANALYSIS**
(Elective)

L	T	P	C
4	1	-	4

UNIT - I
THREE HIGED ARCHES : Elastic theory of arches – Eddy's theorem– Determination of horizontal thrust, bending moment, normal thrust and radial shear – Effect of temperature.

UNIT – II
TWO HINGED ARCHES : Determination of horizontal thrust bending moment, normal thrust and radial shear – Rib shortening and temperature stresses - Tied arches – Fixed arches.

UNIT – III
CABLES : Equation of cable – Analysis of cables under uniformly distributed and concentrated loads - Cables supported at different levels - Length of cable – Effect of temperature changes on cables- Anchor cables.

UNIT-IV
SLOPE DEFLECTION METHOD : Analysis of single bay, single storey, portal frame including side sway - Shear force and bending moment diagrams.

UNIT – V
MOMENT DISTRIBUTION METHOD : Analysis of single bay, single storey portal frames including side sway – Shear force and bending moment diagrams.

UNI T – VI
FLEXIBILITY METHODS : Flexibility coefficients - Flexibility matrices - Sign convention - Application to continuous beams - Temperature stresses - Lack of fit – Support settlements.

UNIT – VII
STIFFNESS METHOD : Stiffness coefficients - Stiffness matrices – Application to continuous beams - Effect of support displacements– Temperature stresses.

UNIT – VIII
BEAMS CURVED IN PLAN : Circular beams loaded uniformly and supported on symmetrically placed columns – Semi-circular beams simply supported on three equally spaced supports.

TEXT BOOKS

1. R.S.Khurmi, *Theory of Structures,* 11th Edition, S.Chand Publications, New Delhi, 2010.
2. V.N. Vazirani, M.M.Ratwani and S.K.Duggal, *Analysis of Structures-Vol.I* (17th Edition) *and Vol.II*(16th Edition), Khanna Publications, New Delhi, 2011.

REFERENCES

1. H.J.Shah and S.B.Junnarkar, *Mechanics of Structures – Vol. II,* 21st Edition, Charotar Publishing House, Anand, Gujrat, 2010.
2. Pandit, G., Gupta, S. and Gupta, R., *Theory of Structures – Vol. II,* 1st Edition, Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi, 1999.
3. B.C.Punmia, *Strength of Materials and Mechanics of Structures,* 7th Edition, Standar Publishers Distributors, New Delhi, 1986.
4. Ramamrutham, S. and Narayanan, R., *Theory of Structures,* 9th Edition, Dhanpat Rai Publishing Co. Ltd., New Delhi, 2010.

IV B.Tech. I Semester

10BT70106 **: SOIL DYNAMICS AND MACHINE FOUNDATIONS (Elective)**

L	T	P	C
4	1	-	4

UNIT - I

FUNDAMENTALS OF VIBRATION : Definitions - Simple harmonic motion - Free and forced vibrations with and without viscous damping - Frequency dependent excitation - Systems under transient loads - Rayleigh's method of fundamental frequency - Logarithmic decrement.

UNIT – II

FREQUENCY OF SOIL SYSTEMS : Determination of viscous damping – Transmissibility - Systems with two and multiple degrees of freedom - Vibration measuring instruments.

UNIT – III

WAVE PROPAGATION : Propagation of seismic waves in soil deposits - Attenuation of stress waves - Stress-strain behavior of cyclically loaded soils - Strength of cyclically loaded soils.

UNIT – IV

DYNAMIC SOIL PROPERTIES : Dynamic soil properties - Laboratory and field testing techniques - Elastic constants of soils - Correlations for shear modulus and damping ratio in sands, gravels, clays and lightly cemented sand - Liquefaction of soils.

UNIT – V

VIBRATION ANALYSES : Types - General requirements - Permissible amplitude - Allowable soil pressure - Modes of vibration of a rigid foundation block - Methods of analysis - Lumped mass models - Elastic half space method - Elastodynamics - Effect of footing shape on vibratory response - Dynamic response of embedded block foundation - Vibration isolation.

UNIT – VI

DESIGN OF MACHINE FOUNDATIONS : Analysis and design of block foundations for reciprocating engines - Dynamic analysis and design procedure for a hammer foundation - IS code of practice - Design procedure for foundations of reciprocating and impact type machines.

UNIT – VII

MACHINE FOUNDATIONS ON PILES : Introduction - Analysis of piles under vertical vibrations - Analysis of piles under translation and rocking- Analysis of piles under torsion - Design procedure for a pile supported machine foundation.

UNIT – VIII

VIBRATION ISOLATION : Types and methods of isolation - Active isolation and passive isolation - Dynamic properties of isolation materials.

TEXT BOOKS

1. Braja M. Das and G. V. Ramana, *Principles of Soil Dynamics,* 2nd Edition, Cengage Learning Inc., Stanford, USA, 2011.
2. P. Srinivasulu, and C. Vaidyanathan, *Hand book of Machine Foundations,* 1st Edition, Tata McGraw-Hill, New Delhi, 1996.

REFERENCES

1. Arya, S. D, O'Neil, M. and Pincus, *Design of Structures and Foundations for Vibrating Machines,* G.Gulf Publishing Co., 1979.
2. Prakash S.,*Soil Dynamics,* McGraw Hill, 1981.
3. Richart, F. E., Hall J. R and Woods R. D., *Vibrations of Soils and Foundations,* Prentice Hall Inc., 1970.
4. Swami Saran, *Soil Dynamics and Machine Foundations,* 1st Edition, Galgotia Publications Pvt. Ltd, 2010.
5. Kramar S.L, PHI Series, *Geotechnical Earthquake Engineering,* 1st Edition, Pearson Education (Singapore) Pvt. Ltd., 2008.
6. Kameswara Rao, *Vibration Analysis and Foundation Dynamics,* Wheeler Publishing, New Delhi, 1998.

IV B.Tech. I Semester

10BT70107 **: DESIGN AND DRAWING OF IRRIGATION STRUCTURES**
(Elective)

L	T	P	C
4	1	-	4

Design and drawing of the following irrigation structures.

1. Surplus weir
2. Tank sluice with tower head
3. Trapezoidal notch fall
4. Canal regulator
5. Type III Siphon aqueduct.
6. Sloping glacis weir

Final Examination pattern: Any two questions of the above six designs may be asked out of which the candidate has to answer one question. The duration of examination will be three hours.

TEXT BOOKS

1. C. Satyanarayana Murthy, *Design of Minor Irrigation and Canal Structures,* Wiley Eastern Ltd, New Delhi.
2. S.K. Garg, *Irrigation Engineering and Hydraulic Structures,* 23rd Edition, Standard Book House, Delhi, 2010.
3. B.C. Punmia, Pande B.B. Lal, Ashok Kumar Jain and Arun Kumar Jain, *Irrigation and Water Power Engineering,* 16th Edition, Laxmi Publications, New Delhi, 2011.

IV B.Tech. I Semester

10BT70108 **: ENIVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
INTRODUCTION : Basic concept of EIA - Initial environmental examination - Elements of EIA - Factors affecting EIA - Impact evaluation and analysis - Preparation of environmental base map - Classification of environmental parameters.

UNIT – II
EIA METHODOLOGIES : Criteria for the selection of EIA Methodology - EIA methods - Adhoc methods, matrix methods, network method - Environmental medium quality index method, overlay methods and cost/benefit analysis.

UNIT – III
ENVIRONMENTAL IMPACT ON SOIL AND GROUND WATER : Prediction and assessment - Soil quality - Methodology for the assessment of soil and groundwater - Delineation of study area - Identification of activities.

UNIT- IV
ENVIORNMENTAL IMPACT ASSEMENT OF SURFACE WATER AND AIR : Impact prediction - Assessment of impact significance - Identification and incorporation of mitigation measures - EIA in surface water, air and biological environment: Methodology for the assessment of impacts on surface water environment - Air pollution sources - Generalized approach for assessment of air pollution Impact.

UNIT – V
ASSEMENT OF IMPACT ON VEGETATION AND WILDLIFE : Assessment of impact of developmental activities on vegetation and wildlife - Environmental impact of deforestation – Causes and effects of deforestation.

UNIT – VI
ENVIRONMENTAL AUDIT : Environmental audit and environmental legislation - Objectives of environmental audit - Types of environmental audit - Audit protocol - Stages of environmental audit - Onsite activities - Evaluation of audit data and preparation of audit report.

UNIT-VII

ENVIRONMENTAL ACTS : Post audit activities - The Environmental protection act - The water act - The air act - Wild life act.

UNIT-VIII

CASE STUDIES : Case studies and preparation of environmental impact assessment statement for various industries.

TEXT BOOKS

1. Y. Anjaneyulu, *Environmental Impact Assessment Methodologies,* 2nd Edition, B.S. Publications, Hyderabad, 2010.
2. J. Glynn and Gary W. Heinke, *Environmental Science and Engineering,* 2nd Edition, Prentice Hall Inc., 1996.

REFERENCES

1. Suresh K. Dhameja, *Environmental Engineering and Management,* S.K. Kataria and Sons, New Delhi, 2010.
2. H.S. Bhatia, *A Text Book of Environmental Pollution and Control,* Galgotia Publication (P) Ltd., Delhi, 2003.

IV B.Tech. I Semester

10BT70109 **: DESIGN OF BRIDGES**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
BRIDGE LOADING STANDARDS : Highway bridge loading standards - Impact factor - Railway bridge loading standards (BG ML Bridge) - Various loads in bridges - Importance of site investigation in bridge design.

UNIT – II
BOX CULVERT : General aspects - Design loads - Design of box culvert subjected to class AA tracked vehicle only.

UNIT – III
DECK SLAB BRIDGE : Effective width method of analysis and design of deck slab bridge (simply supported) subjected to class AA tracked vehicle only.

UNIT – IV
BEAM AND SLAB BRIDGE (T-BEAM BRIDGE) : General features – Design of interior panel of slab – Pigeauds method – Design of a T-beam bridge subjected to class AA tracked vehicle only.

UNIT – V
PLATE GIRDER BRIDGE : Elements of a plate girder and their design - Design of a deck type welded plate girder – Bridge of single line B.G.

UNIT – VI
COMPOSITE BRIDGES : Advantages – Design of composite bridges consisting of RCC slabs over steel girders including shear connectors.

UNIT – VII
BRIDGE BEARINGS : General features – Types of bearings – Design principles of steel rocker and roller bearings – Design of a steel rocker bearing – Design of elastomeric pad bearing.

UNIT VIII
PIERS AND ABUTMENTS : General features – Bed block – Materials piers and abutments - Types of piers – Forces acting on piers – Stability analysis of piers – General features of abutments – Forces acting on abutments – Stability analysis of abutments – Types of wing walls – Approaches – Types of bridge foundations (excluding design).

TEXT BOOKS

1. N. Krishnam Raju, *Design of Bridges,* 4th Edition, Oxford and IBH, Publishing Company Pvt. Ltd., New Delhi, 2010
2. T.R. Jagadish and M.A. Jayaram, *Design of Bridges Structure,* Prentice Hall of India Pvt. Ltd., New Delhi.
3. *Relevant IRC & Railway Bridge Codes.*

REFERENCES

1. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Design of Steel Structures,* 2nd Edition, Laxmi Publications, New Delhi, 2009.
2. Ramachandra, *Design of Steel Structures,* 11th Edition, Scientific Publishers (India), 2009.
3. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, *Design of R.C.C. Structures,* Laxmi Publications, New Delhi.
4. Ponnu Swamy S.,*Bridge Engineering,* 2nd Edition, Tata Mcgraw-Hill Company, New Delhi, 2010.
5. Swami Saran, *Analysis and Design of Substructures – Limit State Design,* 2nd Edition, Oxford and IBH Publishing Company Pvt. Ltd., New Delhi, 2010.

IV B.Tech. I Semester

10BT70110 **: INDUSTRIAL STRUCTURES**
(Elective)

L	T	P	C
4	1	-	4

UNIT - I
PLANNING : Classification of industries and industrial structures – General requirements for industries like cement, chemical and steel plants – Planning and layout of buildings and components.

UNIT - II
FUNCTIONAL REQUIREMENTS : Lighting – Ventilation – Acoustics – Fire safety – Guidelines from factories act.

UNIIT - III
STEEL ROOF STRUCTURES : Industrial roofs – Crane girders – Mill buildings.

UNIT - IV
DESIGN OF R.C. STRUCTURES : Design of folded plates and cylindrical shell roofs.

UNIT V
PREFABRICATION : Principles of prefabrication – Prestressed precast roof trusses - Functional requirements for precast concrete units.

UNIT VI
BUNKERS AND SILOS : Design of bunkers and silos – RCC and steel.

UNIT VII
GRID FLOORS : Analysis and design of grid floors.

UNIT VIII
CHIMNEYS : Design of chimneys **-** RCC and Steel.

TEXT BOOKS

1. P. Purushothaman, *Reinforced Concrete Structural Elements,* Tata McGraw-Hill, New Delhi, 1984.
2. Subramanian. N, *Design of Steel Structures,* Oxford University Press, New Delhi, 2008.

REFERENCES

1. Henn. W, *Buildings for Industry - Vol. I and Vol. II,* London Hill Books, 1995.
2. Pasala Dayaratnam, *Design of Steel Structures,* S. Chand Group, New Delhi, 2008.
3. *Handbook on Functional Requirements of Industrial Buildings,* SP 32 – 1986, Bureau of Indian Standards, New Delhi, 1990.
4. Koncz, J. Bauverlay, *Manual of Precast Construction - Vol. I and Vol. II,* GMBH, 1971.

IV B.Tech. I Semester

10BT70111 **: GROUND IMPROVEMENT TECHNIQUES (Elective)**

L	T	P	C
4	1	-	4

UNIT – I

GROUND IMPROVEMENT : Need and objectives - Identification of problematic soils - Mechanical, hydraulic, physico-chemical, electrical, thermal and strengthening methods - Selection of suitable ground improvement technique based on soil condition.

UNIT – II

DENSIFICATION IN GRANULAR SOILS : Principles of soil densification – Properties of compacted soil - Compaction control tests - Specification of compaction requirements – In-situ densification methods in granular soils – Blasting, virbo-compaction, vibro-replacement, dynamic tamping, stone columns/granular piles and sand/gravel compaction piles - Vibration at the ground surface, impact at the ground surface - Vibration at depth, impact at depth.

UNIT - III

DENSIFICATION IN COHESIVE SOILS : In–situ densification methods in cohesive soils – Preloading or dewatering - Methods of de-watering - Sumps and interceptor ditches - Single, multi-stage well points - Vacuum well points - Horizontal wells - Foundation drains - Blanket drains - Criteria for selection of fill material around drains – Electroosmosis - Vertical drains – Sand drains, sand wick geodrains – Stone and lime columns – Thermal methods.

UNIT – IV

STABILISATION : Modification by admixtures - Shotcreting and guniting technology - Modification at depth by grouting - Methods of stabilization: mechanical, cement, lime, bituminous, chemical stabilization with calcium chloride, sodium silicate and gypsum - Objectives of grouting - Grouts and their properties - Grouting methods: ascending, descending and stage grouting - Hydraulic fracturing in soils and rocks - Post grout test.

UNIT –V

CONFINEMENT : In-situ ground reinforcement - Ground anchors – Rock bolting and soil nailing.

UNIT – VI

REINFORCED EARTH : Principles – Components of reinforced earth – Factors governing design of reinforced earth walls – Design principles of reinforced earth walls.

UNIT – VII

GEOSYNTHETICS : Properties – physical, mechanical, hydraulic, endurance, degradation, tests – Types: Geotextiles, geogrids, geomembranes etc. - Functions and applications - Design for drainage, separation, filtration, reinforcement, multiple functions.

UNIT - VIII

EXPANSIVE SOILS : Problems of expansive soils – Tests for identification – Methods of determination of swell pressure - Improvement of expansive soils – Foundation techniques in expansive soils – Underreamed piles.

TEXT BOOKS

1. Hausmann M.R., *Engineering Principles of Ground Modification,*International Edition, McGraw-Hill, 1989.
2. Purushotham Raj, P., *Ground Improvement Techniques,*1st Edition, Laxmi Publications (P) Ltd., New Delhi, 1999.

REFERENCES

1. Moseley, M.P. and Kirsch. K., *Ground Improvement,* 2nd Revised Edition, Taylor Francis Ltd, United Kingdom, 2004.
2. Xanthakos P.P, Abramson, L.W and Bruce, D.A, *Ground Control and Improvement,* 1st Edition, John Wiley and Sons, New York, USA, 1994.
3. Koerner, R. M., *Designing with Geosynthetics,* 4th Edition, Prentice Hall Inc., New Jersey, USA, 1997.
4. Koerner, R.M., *Construction and Geotechnical Methods in Foundation Engineering,* International Edition, McGraw-Hill, 1984.
5. Jewell, R.A., *Soil Reinforcement with Geotextiles (Report),* CIRIA Special Publication, London, 1996.
6. Das, B. M., *Principles of Foundation Engineering,* 6th Edition, Cengage Learning India, New Delhi, 2007.

IV B.Tech. I Semester

10BT70112 **: WATER RESOURCES SYSTEM PLANNING AND MANAGEMENT**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
INTRODUCTION : Concepts of systems analysis - Systems approach to water resources planning and management - Role of optimization models - Objective function and constraints - Types of optimization techniques.

UNIT – II
LINEAR PROGRAMMING – I : Formulation of linear programming models - Graphical method - Simplex method - Application of linear programming in water resources.

UNIT – III
LINEAR PROGRAMMING – II : Revised simplex method - Duality in linear programming - Sensitivity and post optimality analysis.

UNIT – IV
DYNAMIC PROGRAMMING : Belman's principles of optimality forward and backward recursive dynamic programming - Case of dimensionality - Application of dynamic programming for resource allocation.

UNIT – V
NON-LINEAR OPTIMATIZATION TECHNIQUES : Classical method of optimization - Kun-Tecker - Gradient based research techniques for simple unconstrained optimization.

UNIT – VI
SIMULATION : Application of simulation techniques in water resources.

UNIT – VII
WATER – RESOURCES ECONOMICS : Principles of economics analysis **–** Benefit cost analysis - Socio-economic intuitional and pricing of water resources.

UNIT – VIII
WATER RESOURCES MANAGEMENT : Planning of reservoir system **–** Optimal operation of single reservoir system **–** Allocation of water resources **–** Optimal cropping pattern **–** Conjunctive use of surface and sub-surface water resources.

TEXT BOOKS

1. S. Vedula and P.P. Mujumdar, *Water Resources Systems,* 5th Edition, Tata McGraw-Hill, New Delhi, 2010.
2. James and Lee, *Water Resources Economics,* Oxford Publishers, 2005.
3. S.S. Rao, *Engineering Optimization,* 4th Edition, John Wiley and Sons Inc., USA, 2009.

REFERENCES

1. P.R. Bhave, *Optimal Design of Water Distribution Networks,* Narosa Publishing House, New Delhi, 2003.
2. P. Sankar Iyer, *Operations Research,* TMH Pubilications, New Delhi, 2008.
3. N. Ramanathan, *Operations research,* TMH Pubilications, New Delhi, 2005.

IV B.Tech. I Semester

10BT70113 **: AIR POLLUTION AND CONTROL**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
INTRODUCTION TO AIR POLLUTION : Scope, significance and episodes - Air pollutants – Classifications – Natural and artificial – Primary and secondary, point and non- point, line and areal sources of air pollution - Stationary and mobile sources.

UNIT – II
EFFECTS OF AIR POLLUTION : Effects of air pollutants on man, material and vegetation - Global effects of air pollution – Green house effect, heat islands, acid rains, ozone holes etc.

UNIT-III
THERMODYNAMICS OF AIR POLLUTION : Thermodynamics and kinetics of air-pollution – Applications in the removal of gases like Sox, Nox, CO, HC etc. - Air-fuel ratio - Computation and control of products of combustion.

UNIT – IV
PLUME BEHAVIOUR : Meteorology and plume dispersion - Properties of atmosphere - Heat, pressure, wind forces, moisture and relative humidity - Influence of meteorological phenomena on air quality - Wind rose diagrams.

UNIT-V
POLLUTANT DISPERSION MODELS : Lapse rates - Pressure systems - Winds and moisture plume behaviour - Plume rise models - Gaussian model for plume dispersion.

UNIT-VI
CONTROL OF PARTICULATES : Control of particulates – Control at sources - Process changes - Equipment modifications - Design and operation of control equipments – Settling chambers - Centrifugal separators - Filters dry and wet scrubbers - Electrostatic precipitators.

UNIT – VII
CONTROL OF GASEOUS POLLUTANTS : General methods of control of Nox and Sox emissions – In-plant control measures - Process changes - Dry and wet methods of removal and recycling.

UNIT – VIII

AIR QUALITY MANAGEMENT : Air quality management – Monitoring of SPM, SO; NO and CO Emission standards.

TEXT BOOKS

1. Thod Godish, *Air Quality,* 4th Edition, Levis Publishers, Taylor and Francis Group, New Delhi, 2003.
2. M.N. Rao and H.V.N. Rao, *Air Pollution,* 19th Edition, Tata McGraw-Hill Education Pvt. Ltd., New Delhi, 2010.
3. K. Wark and C.F. Warner, Harper and Row, *Air Pollution: Its Origin and Control,* 3rd Edition, Addison–Wesley, New York, 1998.

REFERENCES

1. R.K. Trivedy and P.K. Goel, *An introduction to Air Pollution,* 2nd Edition, B.S.P. Books Pvt.Ltd, Hyderabad, 2005.
2. K.V.S.G. Murali Krishna, *Air Pollution and Control,* 3rd Edition, Kousal and Co. Publications, New Delhi, 2008.
3. B. Padmanabha Murthy, *Enivronmental Meteorology,* 1st Edition, I.K. Internationals Pvt. Ltd, New Delhi, 2009.

IV B.Tech. I Semester

10BT70114 **: TRANSPORTATION PLANNING AND PAVEMENT DESIGN (Elective)**

L	T	P	C
4	1	-	4

UNIT - I

TRANSPORTATION PLANNING : Transportation planning process **-** System approach to transportation planning - Stages in transportation planning and difficulties in transportation planning process - Transportation survey - Study area - Zoning - Types of surveys - Inventory of transportation facilities - Land use and economic activities.

UNIT- II

TRANSPORT DEMAND ANALYSIS : Trip purpose - Factors governing trip generation and attraction - Multiple linear regression analysis - Trip distribution models - Gravity model - Modal spilt models - Probit analysis - Traffic assignment models - All-or-nothing assignment model.

UNIT – III

PAVEMENT ANALYSIS : Types of pavement – Factors affecting design of pavements – Elastic modulus, Poisson's ratio, wheel load, wheel configuration and tyre pressure – ESWL Concept - Tyre pressure – Contact pressure - Material characteristics – Environmental and other factors.

UNIT – IV

ANALYSIS AND DESIGN OF FLEXIBLE PAVEMENTS :

Analysis: Stresses in flexible pavement – Layered systems concept – One layer system – Boussinesq Two layer system – Burmister theory for pavement design.

Design: Theoretical, empirical and semi-empirical methods - Burmister, CBR Method, AASHO Method, IRC method.

UNIT – V

ANALYSIS AND DESIGN OF RIGID PAVEMENTS :

Analysis: Stresses in rigid pavements – Relative stiffness of slab, modulus of sub-grade reaction – Stresses due to warping, stresses due to loads, stresses due to friction.

Design: **PCA method, AASHTO, IRC method – Joints – Use of tie bsars and dowell bars.**

UNIT – VI

HIGHWAY MATERIALS AND MIX DESIGN : Soil, aggregate and bitumen - Aggregate properties and their Importance - Bituminous concrete - Mix design - Marshall's method of bituminous mix design.

UNIT – VII

HIGHWAY CONSTRUCTION : Construction of earth roads - Gravel roads – WBM roads - Bituminous pavements - Cement concrete roads - Reinforced concrete pavements – Soil stabilization – Methods and objectives - Soil-cement stabilization and Soil-lime stabilization.

UNIT – VIII

HIGHWAY MAINTENANCE : Need for highway maintenance – Failures and their causes in flexible pavements and rigid pavements - Pavement evaluation - Benkleman beam method - Strengthening of existing pavements - Overlays.

TEXT BOOKS

1. S.K. Khanna and C.J. Justo, *Highway Engineering,* 7th Edition, Nemchand & Bros., Roorkee, 2000.
2. L.R. Kadiyali and N.B. Lal, *Principles and Practices of Highway Engineering,* Khanna Publishers, New Delhi, 2003.

REFERENCES

1. E. J. Yoder and Witczak, *Principles of Pavement Design,* 2nd Edition, John Willey and Sons, 1975.
2. Partha Chakraborthy and Animesh Das, *Principles of Transportation Engineering,* Prentice Hall of India, New Delhi.
3. L.R. Kadiyali, *Traffic Engineering and Transportation Planning,* 7th Edition, Khanna Publishers, New Delhi, 2007.
4. C. Jotin Khinsty and B. Kent Lall, *Transportation Engineering,* 3rd Edition, PHI, New Delhi, 2002.

CODES

1. IRC Code for Flexible Pavement – IRC – 37 -2001.
2. IRC Code for Rigid pavement – IRC – 58 – 2002.

IV B.Tech. I Semester

10BT70115 **: GIS AND COMPUTER AIDED DESIGN AND DETAILING LAB**

L	T	P	C
-	-	3	2

GIS SOFTWARE

1. Arc GIS 9.0
2. ERDAS 8.7
3. MapInfo 6.5
4. Any one or Equivalent

LIST OF EXCERCISES

1. Digitization of map/toposheet
2. Creation of thematic maps
3. Study of features estimation
4. Developing digital elevation model
5. Simple applications of GIS in water resources engineering and transportation engineering

CAD SOFTWARE

STAAD PRO or Equivalent

LIST OF EXCERCISES

1. 2-D Frame analysis and design
2. Steel tabular truss analysis and design
3. 3-D Frame analysis and design
4. Retaining wall analysis and design
5. Simple tower analysis and design
6. Analysis and design of solid slab and RCC Tee beam bridges for IRC loading
7. Analysis and design of intz type water tank, circular and rectangular water tanks
8. Analysis and design of plate girder bridge, twin girder deck type railway bridge, truss girder bridges

TEXT BOOKS

1. Chor Pang Lo. Albert, K.W. Yeung, *Concept and Techniques of GIS,* PHI, 2007.
2. Krishnamoorthy, C.S and Rajeev. S., *Computer Aided Design,* Narosa Publishing House, New Delhi, 1991.

REFERENCES

1. Krishnamurthy. D.,*Structural Design and Drawing – Vol. II and Vol.III,* CBS Publishers and Distributors, Delhi, 1992.
2. Groover, M.P. and Zimmers, E.W. Jr., *CAD/CAM: Computer Aided Design and Manufacturing,* Prentice Hall of India Ltd, New Delhi, 1993.
3. Burrough. P. A, *Principles of GIS for Land Resources Assessment,* Oxford University Publication, 2000.
4. Clarke. K.C., *Getting Started with Geographic Information Systems,* 3rd Edition, Prentice Hall of India Ltd, New Delhi, 2001.
5. *SP-16 – 1980: Design Aids for Reinforced Concrete,* Bureau of Indian Standards, New Delhi.
6. *SP-34 – 1987: Hand Book on Concrete Reinforcement and Detailing,* Bureau of Indian Standards, New Delhi.

IV B.Tech. I Semester

10BT70116 **: CONCRETE AND HIGHWAY ENGINEERING LAB**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS

I. ROAD AGGREGATES

1. Aggregate crushing value
2. Aggregate impact test
3. Specific gravity and water absorption
4. Attrition test
5. Abrasion test
6. Shape tests

II. BITUMINOUS MATERIALS

7. Penetration test
8. Ductility test
9. Softening point test
10. Flash and fire point tests

III. CEMENT AND CONCRETE

11. Normal consistency and fineness of cement
12. Initial setting time and final setting time of cement.
13. Specific gravity and soundness of cement
14. Compressive strength of cement
15. Workability test on concrete by Compaction factor, Slump and Vee-bee
16. Young's modulus and compressive strength of concrete
17. Bulking of sand
18. Non-Destructive testing on concrete (for demonstration)

IV B.Tech. II Semester

10BT6HS01 **: MANAGEMENT SCIENCE**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO MANAGEMENT : Concepts of management and organization - Nature and Importance of management - Evolution of management thought - Functions of management - Contributions of F.W. Taylor and Henri Fayol to the management - Systems approach to management - Managerial skills - Elements of corporate planning process - Environmental scanning - SWOT Analysis - Social responsibilities of management.

UNIT - II

DESIGNING ORGANIZATIONAL STRUCTURES : Basic concepts related to organization – Departmentation and decentralization - Types of organizations – Merits, demerits and adoptability to modern firms.

UNIT - III

OPERATIONS MANAGEMENT : Principles and types of plant layout - Methods of production - Forecasting - Forecasting methods - Work study - Basic procedure involved in method study and work measurement - Statistical quality control: Factors affecting quality - Quality control using control charts (simple problems) - Acceptance sampling.

UNIT - IV

MATERIALS MANAGEMENT : Materials management objectives – Inventory - Types of inventory – Safety stock - Classical EOQ model - Need for inventory control – EOQ simple problems - ABC analysis - Purchase procedure - Stores management.

MARKETING : Functions of marketing - Marketing mix - Channels of distribution.

UNIT - V

HUMAN RESOURCES MANAGEMENT (HRM) : Nature and scope of HRM - HRD and personnel management and industrial relations - Functions of HRM - Role of HR Manager in an organization - Performance appraisal - Job evaluation and merit rating - Motivation - Importance of motivation - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

UNIT - VI

PROJECT MANAGEMENT (PERT/CPM) : Network analysis - Program evaluation and review technique (PERT) - Critical path method (CPM) - Identifying critical path - Probability of completing the project within given time - Project cost analysis - Project crashing (simple problems).

UNIT - VII

ENTREPRENEURSHIP : Introduction to entrepreneurship - Definition of an entrepreneur - Entrepreneurial traits - Entrepreneur vs. manager - Entrepreneurial decision process - Role of entrepreneurship in economic development - Social responsibilities of entrepreneurs - Opportunities for entrepreneurs in India and abroad - Women as an entrepreneur.

UNIT - VIII

CONTEMPORARY MANAGEMENT PRACTICES : Basic concepts of Just-In-Time (JIT) system - Total quality management (TQM) - Value chain analysis - Enterprise resource planning (ERP) - Business process outsourcing (BPO) – Globalization-Management challenges - Intellectual property rights - Supply chain management - Role of information technology in managerial decision making.

TEXT BOOKS

1. O.P. Khanna, *Industrial Engineering and Management,* Dhanpat Rai and Sons, 2010.
2. Stoner, Freeman and Gilbert, *Management,* 6th Edition, Pearson Education, New Delhi, 2005.

REFERENCES

1. Kotler Philip and Keller Kevin Lane, *Marketing Mangement,* 12th Edition, PHI, New Delhi, 2007.
2. Koontz and Weihrich, *Essentials of Management,* 6th Edition, TMH, New Delhi, 2007.
3. N.D. Vohra, *Quantitative Techniques in Management,* 2nd Edition, TMH, New Delhi.
4. Heinz Weihrich and Harold Koontz*, Management- A Global Perspective,*10th Edition, McGraw-Hill International.

IV B.Tech. II Semester

10BT80101 **: EARTHQUAKE RESISTANT DESIGN**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
INTRODUCTION TO STRUCTURAL DYNAMICS : Theory of vibrations – Lumped mass and continuous mass systems – Single degree of freedom (SDOF) systems – Formulation of equations of motion – Undamped and damped free vibration – Damping – Response to harmonic excitation – Concept of response spectrum.

UNIT – II
MULTI-DEGREE OF FREEDOM (MDOF) SYSTEMS : Formulation of equations of motion – Free vibration – Determination of natural frequencies of vibration and mode shapes – Orthogonal properties of normal modes – Mode superposition method of obtaining response.

UNIT – III
EARTHQUAKE ANALYSIS : Rigid base excitation – Formulation of equations of motion for SDOF and MDOF Systems – Earthquake response analysis of single and multi-storeyed buildings – Use of response spectra.

UNIT – IV
CODAL DESIGN PROVISIONS : Review of the latest Indian seismic code IS:1893 – 2002 (Part-I) provisions for buildings – Earthquake design philosophy – Assumptions – Design by seismic coefficient and response spectrum methods – Displacements and drift requirements – Provisions for torsion.

UNIT – V
EARTHQUAKE ENGINEERING : Engineering seismology – Earthquake phenomenon – Causes and effects of earthquakes – Faults – Structure of earth – Plate tectonics – Elastic rebound theory – Earthquake terminology – Source, focus, epicenter etc. – Earthquake size – Magnitude and intensity of earthquakes – Classification of earthquakes – Seismic waves – Seismic zones – Seismic zoning map of India – Seismograms and accelerograms.

UNIT – VI
CODAL DETAILING PROVISIONS : Review of the latest Indian seismic codes IS: 4326, IS: 13920 and SP – 34 provisions for ductile detailing of R.C buildings – Beam, column and joints.

UNIT – VII

SEISMIC PLANNING : Plan configurations – Torsion irregularities – Re-entrant corners – Non-parallel systems – Diaphragm discontinuity – Vertical discontinuities in load path – Irregularity in strength and stiffness – Mass irregularities – Vertical geometric irregularity – Proximity of adjacent buildings.

UNIT – VIII

SHEAR WALLS : Types – Design of shear walls as per IS: 13920 – Detailing of reinforcements.

TEXT BOOKS

1. Pankaj Agarwal and Manish Shrikhande, *Earthquake Resistant Design of Structures,* 1st Edition, Prentice Hall of India, New Delhi, 2010
2. S.K. Duggal, *Earthquake Resistant Design of Structures,* 1st Edition, Oxford University Press, New Delhi, 2010.

REFERENCES

1. Clough and Penzien, *Dynamics of Structures,* 3rd Edition, McGraw-Hill International Edition, 2008.
2. A.K. Chopra, *Dynamics of Structures,* 3rd Edition, Pearson Education, New Delhi, 2007.
3. C.V.R. Murty, *Earthquake Tips,* NICEE, I.I.T., Kanpur.
4. R. Ayothiraman and Hemanth Hazarika, *Earthquake Hazard Mitigation,* I.K. International Publishing House Pvt. Ltd., New Delhi.

Codes/Tables

IS Codes: IS: 1893, IS: 4326 and IS: 13920 to be permitted into the examinations hall.

IV B.Tech. II Semester

10BT80102 **: ADVANCED FOUNDATION ENGINEERING**
(Elective)

L	T	P	C
4	1	-	4

UNIT-I
SHALLOW FOUNDATIONS : Bearing capacity – Theories of Prandtl, Terzaghi, Meyerhof, Hansen, Skempton and Vesic – General, local and punching shear failure - Effects of size, depth and shape of footings, tilt and eccentricity of applied loads, water table, compressibility, non-homogeneity and anisotropy of soil - Bearing capacity of isolated footing resting on stratified soils - Button's theory and Siva Reddy analysis - Settlement of foundation: one, two and three dimensional theories.

UNIT-II
ANALYSIS AND STRUCTURAL DESIGN OF R.C.C. FOOTINGS :
Types of foundation – Analysis and structural design of R.C.C. isolated, strap footing, combined footing and mat foundation.

UNIT-III
PILE FOUNDATIONS : Bearing capacity of piles and pile groups – IS method – Settlement of piles – Negative skin friction – Lateral load resistance of individual piles and pile groups – Finite difference method - Non-dimensional method – Simple R.C.C. Design of pile.

UNIT – IV
WELL FOUNDATIONS : Shapes of Wells – Grip length and Bearing Capacity – Forces acting on well foundation – Banerjee's and Gangopadhyay's analysis – IRC method - Individual components of a Well – Sinking of Wells – Rectification of Tilts and Shifts.

UNIT – V
SHEET PILE WALLS : Sheet pile structures – cantilever sheet pile walls in granular soils and cohesive soils – Anchored Bulk head – Free earth supported method – Fixed earth support method – Lateral earth pressure on Braced sheet pile walls.

UNIT-VI
FOUNDATIONS IN PROBLEMATIC SOILS : Foundations in black cotton soils - basic foundation problems associated with black cotton soils - Lime column techniques – Principles and execution - Use of Cohesive Non Swelling (CNS) layer below shallow foundations.

UNIT-VII

DESIGN OF UNDERREAMED PILE FOUNDATIONS : Underreamed piles - principle of functioning of underreamed pile - Analysis and structural design of underreamed pile.

UNIT-VIII

MARINE SUBSTRUCTURES : Introduction - Type of marine structures - Breakwaters, wharves, piers, seawalls, docks, quay walls - Design loads - Wave action - Wave pressure on vertical wall - Ship impact on piled wharf structure - Design of rubble mount break water and wall type break water.

TEXT BOOKS

1. Shamsher Prakash, Gopal Ranjan and Swami Saran, *Analysis and Design of Foundations and Retaining Structures,* Sarita Publishers, Meerut, 1979.
2. P.C. Varghese, *Design of Reinforced Concrete Foundations,* 1st Edition, PHI Learning, New Delhi, 2009.

REFERENCES

1. Swami Saran, *Analysis and Design of Substructures – Limit State Design,* 2nd Edition, Oxford & IBH Publishing Company Pvt. Ltd., New Delhi, 2010.
2. Braja M. Das, *Principles of Foundation Engineering,* 6th Edition, Cengage Learning India, New Delhi, 2007.
3. Teng, W.C., *Foundation Engineering,* 1st Edition, Prentice Hall Inc., New Jersey, USA, 1962.
4. Peck, R.B., Hanson, W.E. and Thornburn, T. H., *Foundation Engineering,* 2nd Edition, Wiley Eastern Ltd., New York, 1980.
5. Bowles, J.E., *Foundation Analysis and Design,* 5th Edition, McGraw-Hill Publishing Company, New York, 2001.
6. C. Venkatramaiah, *Geotechnical Engineering,* 3rd Edition, New Age International Publishers, New Delhi, 2010.
7. V. N. S. Murthy, *Text Book of Soil Mechanics and Foundation Engineering,* 3rd Edition, CBS Publishers & Distributors (P) Ltd., New Delhi, 2010.

IV B.Tech. IISemester

10BT80103 **: WATERSHED MANAGEMENT**
(Elective)

L	T	P	C
4	1	-	4

UNIT-I
INTRODUCTION : Concept of watershed development t- Objectives of watershed development - Need for watershed development in India - Integrated and multidisciplinary approach for watershed management.

UNIT-II
CHARACTERISTICS OF WATERSHED : Size – Shape – Physiography– Slope – Climate – Drainage - Land use – Vegetation- Geology and soils - Hydrology and Hydrogeology - Socio-economic characteristics - Basic data on watersheds.

UNIT-III
PRINCIPLES OF EROSION : Types of erosion - Factors affecting erosion - Effects of erosion on land fertility and land capability - Estimation of soil loss due to erosion - Universal soil loss equation.

UNIT-IV
MEASURES TO CONTROL EROSION : Contour techniques – Ploughing – Furrowing – Trenching – Bunding – Terracing - Gully control - Rock fill dams - Brushwood dam - Gabion.

UNIT-V
WATER HARVESTING : Rainwater harvesting - Catchment harvesting - Harvesting structures - Soil moisture conservation - Check dams - Artificial recharge - Farm ponds - Percolation tanks.

UNIT-VI
LAND MANAGEMENT : Land use and land capability classification - Management of forest – Agricultural - Grassland and wild land - Reclamation of saline and alkaline soils.

UNIT-VII
ECOSYSTEM MANAGEMENT : Role of ecosystem - Crop husbandry- Soil enrichment - Inter, mixed and strip cropping - Cropping pattern- Sustainable agriculture - Bio-mass management - Dry land agriculture - Silvi pasture – Horticulture - Social forestry and afforestation.

UNIT-VIII

PLANNING AND ADMINISTRATION : Planning of watershed management activities - Peoples participation - Preparation of action plan - Administrative requirements.

TEXT BOOKS

1. JVS Murthy, *Watershed Management,* 2nd Edition, New Age International Publishers, New Delhi, 2009.
2. R. A. Wurbs and W.P. James, *Water Resource Engineering,* 1st Edition, PHI, New Delhi, 2001.

REFERENCES

1. V.V.N. Murthy, *Land and Water Management,* 4th Edition, Kalyani Publications, Punjab, 2008.
2. D.K. Majumdar, *Irrigation and Water Management,* 1st Edition, PHI, New Delhi, 2010.

IV B.Tech. II Semester

10BT80104 **: ENVIRONMENTAL SANITATION**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
INTRODUCTION : Environmental sanitation **–** Scope **-** Communicable diseases – Role of environmental engineers in the prevention of diseases – Present status of environmental sanitation in Indian villages, towns and cities – Total sanitation.

UNIT – II
COMMUNICABLE DISEASES : Origin and spread of communicable diseases – Typhoid - Cholera – Malaria – Filaria – Plague – Tuber Culosis – HIV/AIDS – Role of vectors – Prevention of the above diseases - Epidemiology.

UNIT – III
RURAL WATER SUPPLY : Sanitary protection of wells – Disinfection by Two pot system – Treatment for Fluorides, Arsenic, Iron and Manganese and Nitrates.

UNIT – IV
RURAL SANITATION : Rural latrines – Animal waste disposal – Biomass – Biogas production.

UNIT – V
FOOD SANITATION : Food poisoning – Food preservation – Sanitary maintenance of catering and eating establishments – Milk sanitation - Milk and milk products – Sanitation of market places – Slaughter houses.

UNIT – VI
INSTITUTIONAL SANITATION : Sanitary requirements and maintenance of public places – Schools – Hospitals – Jails and Offices – Swimming pools.

UNIT – VII
REFUSE SANITATION : Quality and quantity of refuse – Conveyance – Disposal methods – Sanitary land fill - Composting – Vermi composting – Mechanical composting – Incineration.

UNIT – VIII

OCCUPATIONAL HAZARDS : Hazards in industries – Mining operations – Hazards due to radiological pollution – Preventive measures – Natural and mechanical ventilation and exhaust systems.

TEXT BOOKS

1. Salvato, *Environmental Sanitation,* 3rd Edition, Tata McGraw-Hill, New Delhi, 1982.
2. Ehlers, V.M. and Steel, E.W., *Municipal Sanitation,* Tata McGraw-Hill, New Delhi, 1972.

REFERENCES

1. Chanlet, E.T., *Environmental Protection,* McGraw-Hill Inc., 1979.
2. Krishnan, N.V., *Safety Management in Industry,* Jaico Publishing House, Bombay, 1992.

IV B.Tech. II Semester

10BT80105 **: ARCHITECTURE AND TOWN PLANNING**
(Elective)

L	T	P	C
4	1	-	4

UNIT I
ARCHITECTURAL DESIGN : Architectural design – Analysis – Integration of function and aesthetics – Introduction to basic elements and principles of design.

UNIT II
SITE PLANNING : Surveys – Site analysis – Development control – Layout regulations - Layout design concepts – Integration of building services – Interior design.

UNIT III
BUILDING ARCHITECTURE AND SERVICES : Residential, institutional, commercial and industrial – Application of anthropometry and space standards - Inter relationships of functions– Safety standards – Building rules and regulations – Integration of building services – Interior design.

UNIT IV
CLIMATE AND ENVIRONMENTAL RESPONSIVE DESIGN : Man and environment interaction - Factors that determine climate – Characteristics of climate types – Design for various climate types – Passive and active energy controls – Green building concept.

UNIT V
TOWN PLANNING : Planning – Definition, concepts and processes– Aims and objectives of planning – Levels of planning in India and their interrelationship – Planning administration.

UNIT VI
PLANNING PROCESS AND STRUCTURE : Models of planning processes – Components of settlement structures – Models of urban structure – Demand and supply of land for urban use - Means and mechanism – Impact on urban structure - Goals of land policy.

UNIT VII
LAND USE PLANNING : Concept of land use – Locational attributes of land use – Land use planning information system – Activity system and choice of space qualities – System approach and physical planning – Approach to land use planning– Introduction to spatial planning at regional level – Choice theory and advocacy planning and their application action plan and its relevance – Development plan types – Scope and objectives - Principles of landscape design

UNIT VIII

REGIONAL PLANNING AND STANDARDS : Planning practices in India – Method of identifying urban and regional problem – Setting of goals objectives and priorities – Performance standards – Spatial standards and standard for utilities – Classification of regions – Regionalization and delineation techniques for various types of regions – Cluster and factor analysis method.

TEXT BOOKS

1. Francis D.K. Ching, *Architecture: Form, Space and Order,* VNR, N.Y., 1999.
2. Margaret Robert, *An Introduction to Town Planning Techniques,* Hutchinson London, 1990.

REFERENCES

1. Givoni B., *Man Climate and Architecture,* Applied Science, Barking ESSEX, 1982
2. *Planning and Architects Handbook,* Edward D. Mills, Butterworth London, 1995.
3. Gallian B. Arthur and Simon Eisner, *The Urban Pattern – City Planning and Design,* Affiliated Press Pvt. Ltd., New Delhi, 1995.
4. J.N. Robinson, *Planning and Forecasting Technique: An Introduction to Macroeconomics Applications,* 1972.
5. FALUDI, ANDREAS, *Planning Theory,* Pergamon Press, 1973.
6. Theodore William Patterson, Van Nostrand Reinhold, *Land use Planning: Techniques of Implementation,* 1979.

IV B.Tech. II Semester

10BT80106 **: PRESTRESSED CONCRETE**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
PRINCIPLES OF PRESTRESSING : Historic development – General principles of prestressing - Advantages and limitations of prestressed concrete – Materials – High strength concrete and high tensile steel.

UNIT – II
METHODS OF PRESTRESSING : Methods and systems of prestressing - Pre-tensioning and post tensioning – Analysis of post tensioning - Different systems of prestressing - Hoyer system - Magnel system, Freyssinet system and Gifford-Udall system.

UNIT – III
LOSSES OF PRESTRESS : Loss of prestress in pre-tensioned and post-tensioned members due to various causes like elastic shortage of concrete - Shrinkage of concrete - Creep of concrete - Relaxation of steel - Slip in anchorage bending of member and frictional losses.

UNIT – IV
ANALYSIS OF SECTION FOR FLEXURE : Analysis of sections for flexure - Prestressed with straight, concentric, eccentric tendons, bent and parabolic tendons.

UNIT – V
DESIGN OF SECTIONS FOR FLEXURE AND SHEAR : Allowable stresses - Design criteria as per I.S.Code – Elastic design of simple rectangular and I-section for flexure and shear – Kern lines, cable profile.

UNIT – VI
ANALYSIS OF END BLOCKS : Guyon's method and Mugnel method-Anchorage zone stresses – Approximate method of design – Anchorage zone reinforcement – Transfer of prestress pre-tensioned members.

UNIT – VII
COMPOSITE SECTION : Composite section - Analysis of stress – Differential shrinkage – General designs considerations.

UNIT – VIII

DEFLECTIONS OF PRESTRESSED CONCRETE BEAMS : Importance of control of deflections – Factors influencing deflections – Short term deflections of uncracked members prediction of long term deflections.

TEXT BOOKS

1. Krishna Raju, *Prestressed Concrete,* 4thEdition, Tata McGraw-Hill Publications, New Delhi, 2011.
2. N. Rajagopalan, *Prestressed Concrete,* 2nd Edition, Narosa Publications, New Delhi, 2010.

REFERENCES

1. Ramamrutham, *Prestressed Concrete,* 5thEdition, Dhanpat Rai Publications, New Delhi, , 2003.
2. T.Y. Lin and Ned H. Burns, *Design of Prestressed Concrete Structures,* 3rd Edition, John Wiley and Sons, 2010.

IS Codes

IS 1343 is to be permitted into the examination hall.

IV B.Tech. II Semester

10BT80107 : **WATER POWER ENGINEERING**
(Elective)

L	T	P	C
4	1	-	4

UNIT - I
HYDROPOWER : Introduction to water power - Hydropower development - Sources of energy - Estimation of water power potential - Load curve - Load factor - Capacity factor - Utilization factor - Diversity factor - Load duration curve - Firm power - Secondary power - Prediction of load.

UNIT - II
WATER POWER ESTIMATE : Collection and analysis of stream flow data – Mass curve – Flow duration curves – Construction and utility of these curves – Effect of storage and pondage – Estimates of available water power.

UNIT - III
HYDROPOWER PLANTS : Low and high head plants: classification of hydel plants - Run-off- river plants - General arrangement of run-off-river plants - Valley dam plants - Diversion canal plants - High head diversion plants - Storage and pondage.

UNIT - IV
PUMPED STORAGE POWER PLANTS : Basic features - Advantages of pumped storage plants - Types of pumped storage plants - Relative merits of two-unit and three-unit arrangement.

UNIT - V
HYDRAULIC TURBINES : Classification of turbines – Francis, Kaplan and Pelton turbines – Component parts and their function – Draft tubes and their theory – Similarity laws and specific speed unit, quantities – Performance curves – Governing of turbines – Selection of turbines – Cavitation in turbines.

UNIT - VI
WATER CONVEYANCE : Classification of penstocks - Design criteria- Economical diameter - Anchor blocks - Conduit valves - Bends and manifolds.

UNIT - VII

CHANNEL SURGES AND INTAKES : Water Hammer - Resonance in Penstocks - Channel surges - Surge tanks - Intakes - Types - Losses- Air entrainment - Inlet aeration - Canals - Forebay – Tunnels – Selection of turbines.

UNIT V - III

POWER HOUSE AND EQUIPMENT : Location of power house – General arrangement of hydroelectric unit – Number and size of units – Power house substructure – Pumped storage plant.

TEXT BOOKS

1. M.M. Dandekar and K.N. Sharma, *Water Power Engineering,* Vikas Publishing House Pvt. Ltd., India, 2007
2. R.K. Sharma and T.K. Sharma, *A Text Book of Water Power Engineering,* S. Chand Company, New Delhi, 2008.

REFERENCES

1. B. C. Punmia, B. B. Pande Lal, Ashok Kumar Jain and Arun Kumar Jain, *Irrigation and Water Power Engineering,* Laxmi Publications, New Delhi, 2009.
2. P.N. Modi, *Irrigation Water Resources and Water Power Engineering,* 7th Edition, Standard Book House, 2008.
3. K.R. Arora, *Irrigation, Water Power and Water Resources Engineering,* 4th Edition, Standard Publishers Distributors, Delhi, 2011.
4. Deshmukh, *Water Power Engineering,* Dhanpat Rai and Sons, New Delhi.

IV B.Tech. II Semester

10BT80108 **: GROUNDWATER DEVELOPMENT AND MANAGEMENT (Elective)**

L	T	P	C
4	1	-	4

UNIT – I

GROUNDWATER OCCURRENCE : Groundwater hydrologic cycle - Origin of groundwater - Rock properties effecting groundwater - Vertical distribution of groundwater - Zone of aeration and zone of saturation - Geologic formation as aquifers - Types of aquifers - Porosity, specific yield and specific retention.

UNIT – II

GROUNDWATER MOVEMENT : Permeability - Darcy's law - Storage coefficient – Transmissivity - Differential equation governing groundwater flow - Groundwater flow equation - Groundwater flow contours and their applications.

UNIT – III

ANALYSIS OF PUMPING TEST DATA – I : Steady groundwater flow towards a well in confined and unconfined aquifers – Dupit's and Thiem's equations – Assumptions - Formation constants - Yield of an open well.

UNIT – IV

ANALYSIS OF PUMPING TEST DATA – II : Unsteady flow towards a well – Non equilibrium equations – Thies solution – Jocob and Chow's simplifications - Leaky aquifers.

UNIT – V

SURFACE AND SUBSURFACE INVESTIGATION : Surface methods of exploration – Electrical resistivity and seismic refraction methods - Subsurface methods – Geophysical logging and resistivity logging - Aerial photogrammetry applications along with case studies in subsurface investigation.

UNIT – VI

ARTIFICIAL RECHARGE OF GROUND WATER : Concept of artificial recharge – Recharge methods - Relative merits - Applications of GIS and Remote Sensing in artificial recharge of groundwater along with case studies.

UNIT – VII

SALINE WATER INTRUSION IN AQUIFER : Occurrence of saline water intrusions - Ghyben- Herzberg relation - Shape of interface - Control of seawater intrusion.

UNIT – VIII

GROUNDWATER BASIN MANAGEMENT : Concepts of conjunction use - Case studies.

TEXT BOOKS

1. H.M. Raghunath, *Ground Water,* 3rd Edition, Wiley Eastern Ltd., New Delhi, 2009.
2. David Keith Todd, *Ground Water Hydrology,* 2nd Edition, Wiley India Pvt. Ltd., New Delhi, 2010.

REFERENCES

1. Bawvwr, *Ground Water,* John Wiley and Sons.
2. R.Willis and W.W.G. Yeh, *Ground Water System Planning and Management,* PHI, 1987.
3. C.W. Fetter, *Applied Hydrogeology,* 4th Edition, PHI, New Delhi, 2010.
4. *Applied Principles of Hydrology, Manning,* CBS Publishers Distributers, New Delhi, 2007.
5. K. R. Karanth, *Ground Water Assessment, Development And Management,* 1st Edition, TMH, New Delhi, 2003.

IV B.Tech. II Semester

10BT80109 **: INDUSTRIAL WASTE WATER TREATMENT**
(Elective)

L	T	P	C
4	1	-	4

UNIT – I
WATER QUALITY REQUIRMENTS : Quality requirements of boiler and cooling waters – Quality requirements of process water for Textiles – Food processing and brewery industries – Boiler and cooling water treatment methods.

UNIT – II
TREATMENT OF WATER : Water for boiler – Cooling - Softening - Ion exchange – MSP.

UNIT – III
PRINCIPLES OF TREATMENT : Basic theories of industrial waste water treatment – Volume reduction – Strength reduction – Neutralization – Equalization and proportioning.

UNIT – IV
LIQUID WASTES AND TREATMENT - I : Origin of liquid waste from textiles, paper and pulp industries - Thermal power plants and tanneries - Special characteristics - Effects and treatment methods - Manufacturing process and design origin of liquid waste from fertilizers, distillers and dairy - Special characteristics - Effects and treatments methods.

UNIT – V
LIQUID WASTES AND TREATMENT - II : Origin of liquid waste from sugar mills, steel plants, oil refineries, and pharmaceuticals plants - Special characteristics - Effects and treatment methods.

UNIT – VI
RECIRCULATION AND EFFLUENT TREATMENT : Recirculation of industrial wastes – Use of municipal waste water in industries - Manufacturing processes – Common effluent treatment plants – Advantages and suitability – Limitations - Effluent disposal methods.

UNIT – VII
JOINT TREATMENT OF WASTES : Joint treatment of industrial wastes and domestic wastes – Consequent problems – Industrial waste water discharges into streams, lakes and oceans and problems – Land disposal – Aquifer treatment system.

UNIT – VIII

WASTE LAND REMEDIATION AND RECLAMATION : Definition of waste land - Characteristics of waste land - Physical chemical and biological pollution of soils - Ground water pollution – Dumping - Sand fills - Remediation methods – Physical, chemical and biological methods.

TEXT BOOKS

1. M.N. Rao and Dutta, *Waste Water Treatment,* 3rd Edition, Oxford and IBH Publishers, New Delhi, 2009.
2. Met Calf and Eddy, *Waste water Engineering, Treatment and Re Use,* 4th Edition, Tata Mc Graw - Hill Education Private Limited, New Delhi, 2010.

REFERENCES

1. Newmerow, *Liquid Waste of Industry,* Pearson Education Publishing Co., 1971.
2. Mark J. Hammer and Mark J. Hammer Jr., *Water and Waste Water technology,* 6th Edition, 2008.

IV B.Tech. II Semester

10BT80110 **: NATURAL DISASTER MITIGATION AND MANAGEMENT (Elective)**

L	T	P	C
4	1	-	4

UNIT – I

INTRODUCTION : Types of disasters - Natural disasters - Impact of disasters on environment - Infrastructure and development - Concepts of hazards and vulnerability analysis.

UNIT – II

HAZARD ASSESSMENT : Guidelines for hazard assessment and vulnerability analysis - Basic principles and elements of disaster mitigation.

UNIT – III

EARTHQUAKES : Introduction to earthquakes - Intensity scale (MSK-64) - Seismic activity in India - Seismic zones of India - Earthquakes in A.P. - Action plan for earthquake disaster preparedness - Elements at risk, recovery and rehabilitation after earthquake - Earthquake resistant design and construction of buildings.

UNIT – IV

TSUNAMIS : Onset, types and causes – Warning - Element at risk - Typical effects - Specific preparedness and mitigation strategies.

UNIT – V

FLOODS AND CYCLONES : Onset, types, warnings - Elements at risk - Typical effects - Indian floods and cyclones - Hazard zones - Potential for reducing hazards - Mitigation strategies and community based mitigation.

UNIT – VI

LANSLIDES : Onest, types and warning - Causes of landslides - Elements at risk - Indian land slides - Hazards zones - Typical effects - Mitigation strategies and community based mitigation.

UNIT – VII

DROUGHTS : Onset, types and warning - Kinds of droughts - Causes of droughts - Impact of droughts - Early warning and response mechanisms - Mitigation strategies - Droughts in India.

UNIT – VIII

DISASTER MANAGEMENT : Disaster management organization and methodology - Disaster management cycle - Disaster management in India - Typical cases - Cost-benefit analysis with respect to various disaster management programmes implemented by NGOs and Government of India.

TEXT BOOKS

1. V.K. Sharma, *Disaster Management,* National Centre for Disaster Management, IIPE, Delhi. 1999.
2. A.S. Arya, Anup Karanth, and Ankush Agarwal, *Hazards, Disasters and Your Community: A Primer for Parliamentarians,* GOI-UNDP Disaster Risk Management Programme, 2005.

REFERENCES

1. *Disaster Management in India*, A Status Report Publication of the Govt. of India, Ministry of Home Affairs, National Disaster Management Division, August 2004.
2. *Drought in India: Challenges and Initiatives*, Poorest Areas in Civil Society (PACS) Programme, 2001-2008, Website: www.empowerpoor.org.
3. *Disaster Preparedness Programme in India: A Cost Benefit Analysis*, Commissioned and published by the Humanitarian Practice Network at ODI HPN, website: www.odihpn.org.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

COURSE STRUCTURE (2011-2012)

I B.Tech. (yearly pattern)

Department of Mechanical Engineering

Code	SUBJECT	Periods/Week			C	Scheme of Examination Max. Marks		
		L	T	P		Internal Marks	External Marks	Total
10BT1HS01	Technical English	2	-	-	4	30	70	100
10BT1BS01	Engineering Physics	2	1	-	4	30	70	100
10BT1BS02	Engineering Chemistry	2	1	-	4	30	70	100
10BT1BS03	Engineering Mathematics	3	1	-	6	30	70	100
10BT10101	Engineering Mechanics	3	1	-	6	30	70	100
10BT1EC01	Problem Solving and Computer Programming	3	1	-	6	30	70	100
10BT1EC02	Engineering Drawing	-	1	3	4	25	50	75
10BT1EC03	Computer Programming Lab	-	-	3	4	25	50	75
10BT1BS06	Engineering Physics & Engineering Chemistry Lab	-	-	3	4	25	50	75
10BT1HS02	English Language & Communication Skills Lab	-	-	3	4	25	50	75
10BT1EC04	Engineering & IT Workshop	-	-	3	4	25	50	75
	TOTAL	15	6	15	**50**	305	670	**975**
		36						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF MECHANICAL ENGINEERING

II B.Tech. I Semester

Code	SUBJECT	Periods/Week				Scheme of Examination Max. Marks		
		L	T	P	C	Internal Marks	External Marks	Total
10BT3BS04	Matrices and Numerical Methods	4	1	-	4	30	70	100
10BT30301	Strength of Materials	4	1	-	4	30	70	100
10BT30224	Basics of Electrical and Electronics Engineering	4	-	-	4	30	70	100
10BT30302	Materials Science and Metallurgy	4	1	-	4	30	70	100
10BT30303	Thermodynamics	4	1	-	4	30	70	100
10BT30304	Machine Drawing	4	2		4	30	70	100
10BT30232	Electrical and Electronics Engineering Lab	-	-	3	2	25	50	75
10BT30311	Strength of Materials and Materials Science Lab	-	-	3	2	25	50	75
	TOTAL	24	6	6	**28**	230	520	**750**
		36						

II B.Tech. II Semester

Code	SUBJECT	Periods/Week				Scheme of Examination Max. Marks		
		L	T	P	C	Internal Marks	External Marks	Total
10BT3BS01	Probability and Statistics	4	1	-	4	30	70	100
10BT4HS01	Managerial Economics and Principles of Accountancy	4	-	-	4	30	70	100
10BT40301	Kinematics of Machinery	4	1	-	4	30	70	100
10BT40302	Thermal Engineering - I	4	1	-	4	30	70	100
10BT30121	Fluid Mechanics and Hydraulic Machinery	4	1	-	4	30	70	100
10BT40303	Manufacturing Technology	4	-	-	4	30	70	100
10BT40112	Fluid Mechanics and Hydraulic Machinery Lab	-	-	3	2	25	50	75
10BT40311	Manufacturing Technology Lab	-	-	3	2	25	50	75
10BT40312	Computer Aided Machine Drawing(**Audit Course**)	-	2	-	-	-	-	-
	TOTAL	24	6	6	**28**	230	520	**750**
		36						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF MECHANICAL ENGINEERING

III B.Tech. I Semester

Code	SUBJECT	Periods/Week				Scheme of Examination Max. Marks		
		L	T	P	C	Internal Marks	External Marks	Total
10BT3BS02	Environmental Sciences	4	-	-	4	30	70	100
10BT50301	Thermal Engineering - II	4	1	-	4	30	70	100
10BT50302	Dynamics of Machinery	4	1	-	4	30	70	100
10BT50303	Machine Tools	4	1	-	4	30	70	100
10BT50304	Design of Machine Elements-I	4	1	-	4	30	70	100
10BT50305	Industrial Engineering and Management	4	-	-	4	30	70	100
10BT50311	Machine Tools Lab	-	-	3	2	25	50	75
10BT50312	Thermal Engineering Lab	-	-	3	2	25	50	75
10BT50313	MATLAB(**Audit Course)**	-	2	-	-	-	-	-
	TOTAL	24	6	6	**28**	230	520	**750**
		36						

III B.Tech. II Semester

Code	SUBJECT	Periods/Week				Scheme of Examination Max. Marks		
		L	T	P	C	Internal Marks	External Marks	Total
10BT60301	Operations Research	4	1	-	4	30	70	100
10BT60302	Metrology & Measurements	4	-	-	4	30	70	100
10BT60303	Heat Transfer	4	1	-	4	30	70	100
10BT60304	CAD/CAM	4	-	-	4	30	70	100
10BT60305	Design of Machine Elements-II	4	1	-	4	30	70	100
10BT60306	Automobile Engineering	4	-	-	4	30	70	100
10BT60311	Heat Transfer & Dynamics Lab	-	-	3	2	25	50	75
10BT60312	CAD/CAM Lab	-	-	3	2	25	50	75
10BT60313	Seminar	-	-	-	2	75	-	75
10BT4HS02	Advanced English Communication Skills (**Audit Course)**	-	3	-	-	-	-	-
	TOTAL	24	6	6	**30**	305	520	**825**
		36						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF MECHANICAL ENGINEERING

IV B.Tech. I Semester

Code	SUBJECT	Periods/Week				Scheme of Examination Max. Marks		
		L	T	P	C	Internal Marks	External Marks	Total
10BT70301	Manufacturing Systems Design	4	1	-	4	30	70	100
10BT70302	Industrial Automation & Robotics	4	1	-	4	30	70	100
10BT70303	Finite Element Methods	4	1	-	4	30	70	100
10BT70304	Production & Operations Management	4	1	-	4	30	70	100
	ELECTIVE –I	4	1	-	4	30	70	100
10BT70305	Refrigeration and Air Conditioning							
10BT70306	Tool Design							
10BT70307	Mechanical Vibrations							
10BT70308	Engineering Optimization							
	ELECTIVE –II	4	1	-	4	30	70	100
10BT70309	Power Plant Engineering							
10BT70310	Composite Materials							
10BT70311	Mechatronics							
10BT70312	Entrepreneurship							
10BT70313	Metrology & Measurements Lab	-	-	3	2	25	50	75
10BT70314	Manufacturing Systems Lab	-	-	3	2	25	50	75
10BT70315	Mini Project	-	-	-	2	25	50	75
	TOTAL	24	6	6	**30**	255	570	**825**
		36						

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet – 517 102

COURSE STRUCTURE

DEPARTMENT OF MECHANICAL ENGINEERING

IV B.Tech. II Semester

Code	SUBJECT	Periods/Week				Scheme of Examination Max. Marks		
		L	T	P	C	Internal Marks	External Marks	Total
10BT80301	World Class Manufacturing	4	-	-	4	30	70	100
	ELECTIVE III	4	-	-	4	30	70	100
10BT80302	Non-Conventional Energy Sources							
10BT80303	Non-Traditional Machining Processes							
10BT80304	Geometric Modeling							
10BT80305	Professional Ethics and Intellectual Property Rights							
	ELECTIVE IV	4	1	-	4	30	70	100
10BT80306	Computational Fluid Dynamics							
10BT80307	Supply Chain Management							
10BT80308	Rapid Prototyping							
10BT80309	Micro Electro Mechanical Systems							
10BT80311	Comprehensive Viva	-	-	-	2	100	-	100
10BT80312	Project Work	-	-	12	12	75	150	225
	TOTAL	12	1	12	**26**	265	360	**625**
		25						

B.Tech. I Year

10BT1HS01: TECHNICAL ENGLISH

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	-	-	4

UNIT –I

1. Lesson entitled ***Heaven's Gate*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mokshagundam Visvesvaraya*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –II

1. Lesson entitled ***Sir CV Raman: a Path breaker in the Saga of Indian Science*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Mother Teresa*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –III

1. Lesson entitled ***The Connoisseur*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Dr. Amartya Kumar Sen*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

UNIT –IV

1. Lesson entitled ***The Cuddalore Experience*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Kalpana Chawla*** from ***Internet***

UNIT –V

1. Lesson entitled ***Bubbling Well Road*** from ***Enjoying Everyday English***, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Nandan Nilekani*** from ***Internet.***

UNIT –VI

1. Lesson entitled ***The Odds against Us*** from **Enjoying Everyday English**, Published by Sangam Books, Hyderabad
2. Lesson entitled ***Charles Chaplin*** from ***Inspiring Lives***, Published by Maruthi Publications, Guntur

* Exercises from the lessons not prescribed shall also be used for classroom tasks.

UNIT – VII

Exercises on Reading and Writing Skills :

Reading Comprehension
Letter writing
Essay writing

UNIT – VIII

Practice Exercises on Remedial Grammar :

Common errors in English
Subject-Verb agreement
Articles
Prepositions
Tenses
Active/Passive Voice
Reported Speech

TEXTBOOKS :

Detailed study : *Enjoying Everyday English*, Sangam Books, 2009.

Non-detailed study : *Inspiring Lives,* Maruthi Publications, 2009.

REFERENCE BOOKS:

1. *Innovate with English: A Course in English for Engineering Students*, edited by T Samson, Foundation Books
2. *English Grammar Practice*, Raj N Bakshi, Orient Longman, 2005
3. *Effective English*, edited by E Suresh Kumar, A RamaKrishna Rao, and P Sreehari, Published by Pearson
4. *Handbook of English Grammar & Usage*, Mark Lester and Larry Beason, Tata Mc Graw–Hill, 2008
5. *Spoken English*, R.K. Bansal & JB Harrison, Orient Longman, 1989
6. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009.
7. *Objective English*, Edgar Thorpe & Showick Thorpe, Pearson Education, 2009
8. *Grammar Games*, Renuvolcuri Mario, Cambridge University Press, 2008
9. *Murphy's English Grammar* with CD, Murphy, Cambridge University Press, 2004
10. *Everyday Dialogues in English*, Robert J. Dixson, Prentice Hall India Pvt. Ltd., 2005

11. *ABC of Common Errors*, Nigel D Turton, Mac Millan Publishers
12. *Effective Technical Communication*, M Ashraf Rizvi, Tata McGraw–Hill, 2009
13. *An Interactive Grammar of Modern English*, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO.
14. *A Communicative Grammar of English*, Geoffrey Leech, Jan Svartvik, Pearson Education, 2003
15. *Enrich your English*, Thakur K B P Sinha, Vijay Nicole Imprints Pvt. Ltd.
16. *A Grammar Book for You And I*, C. Edward Good, MacMillan Publishers, 2008
17. *Learning English A Communicative Approach*, Orient Longman, 2005

B.Tech. I Year

10BT1BS01: ENGINEERING PHYSICS

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Crystal Structures and X-Ray Diffraction : Introduction, space lattice, basis, unit cell, lattice parameter, Bravais lattices, crystal systems, structure of simple cubic, body centered cubic, face centered cubic crystals, Miller indices of planes and directions in crystals, separation between successive (hkl) planes.

Crystal Defects: Point defects, line defects, Burger's vector, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-II

Principles of Quantum Mechanics: Waves and particles, de-Broglie's hypothesis, G.P.Thomson experiment, Heisenberg's uncertainity principle, significance of wave function, Schrödinger's one dimensional wave equation (time independent), particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment only), scattering-source of electrical resistance.

Band Theory of Solids: Electron in a periodic potential, Kronig-Penney model (qualitative treatment only), origin of energy band formation in solids, distinction between metals, semiconductors and insulators based on band theory.

UNIT-III

Semiconductors: Introduction, intrinsic and extrinsic semiconductors, carrier concentration, electrical conductivity in semiconductors, drift and diffusion, Einstein's relation, Hall effect, direct and indirect band gap semiconductors, p-n junction, energy diagram of p-n diode, diode equation, LED, LCD and photo diode.

UNIT-IV

Magnetic Properties: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials, magnetic bubbles memory.

Dielectric Properties: Introduction, dielectric constant, electronic, ionic and orientation polarizations (qualitative treatment only), local field, Clausius-Mossotti equation, frequency dependence of polarisability (qualitative treatment only), ferro and piezo electricity.

UNIT-V

Acoustics of Buildings and Acoustic Quieting: Basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for reverberation time (qualitative treatment), measurement of absorption coefficient of a material, factors affecting the architectural acoustics and their remedies.

Acoustic Quieting: Aspects of acoustic quieting, methods of quieting, quieting for specific observers**,** mufflers and sound proofing.

UNIT-VI

Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.

Lasers: Introduction, characteristics of laser, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers in industry, scientific and medical fields.

UNIT-VII

Fiber Optics: Introduction, principle of optical fiber, acceptance angle and acceptance cone, numerical aperture, types of optical fibers and refractive index profiles, optical fiber communication systems, application of optical fibers.

Holography: Introduction, construction of a hologram, reconstruction of image from hologram and applications.

UNIT-VIII

Nanomaterials: Introduction, basic principles of nanomaterials, preparation of nanomaterials, ball milling, plasma arching, chemical vapour deposition method, sol-gel method, fabrication of nanomaterials, properties of nanomaterials, carbon nanotubes, properties and applications of carbon nanotubes, applications of nanomaterials.

TEXTBOOKS :

1. *Applied Physics*, S. Mani Naidu, Pearson Education, 1st Edition
2. *Engineering Physics*, P.K. Palaniswamy, Scitech Publications India Private Limited, 2009
3. *Engineering Physics*, M.R. Srinivasan, New Age Publications International (P) Limited, 1st Edition

REFERENCE BOOKS:

1. *Applied Physics*, S.O. Pillai and Sivakami, New Age International (P) Ltd., 2nd Edition
2. *Introduction to Nanoscience and Nanotechnology*, K.K. Chatopadhyaya and A.N. Benarjee, Prentice Hall of India, 1st Edition
3. *Introduction to Solid State Physics*, C. Kittel, John Wiley & Sons, Inc., 7th Edition
4. *Solid State Physics*, A.J. Dekker, Macmillan India Limited, 1996
5. *Engineering Physics,* V. Rajendran and K. Thyagarajan, TataMcGraw Hill Education, 2010

B.Tech. I Year

10BT1BS02: ENGINEERING CHEMISTRY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
2	1	-	4

UNIT-I

Chemistry of Engineering Materials:

Lubricants: Definition, functions of lubricants, mechanism of lubrication, classification of lubricants, properties of lubricants-viscosity, flash and fire points, cloud and pour points, Aniline point, neutralization number and mechanical strength.

Liquid Crystals: Definition, structure, classification and engineering applications of liquid crystals.

Insulators: Definition, classification, characteristics of insulating material and their engineering applications.

UNIT-II

Polymer Science and Technology: Introduction, classification of polymers, functionality, polymerization and types of polymerization, plastics-thermoplastics, thermosettings, composition, preparation and engineering applications of PVC, Teflon and Bakelite.

Rubber: Vulcanization of rubber.

Elastomers: BUNA-N, BUNA-S and polyurethane.

Conducting Polymers: Definition, classification and engineering applications.

UNIT-III

Electrochemistry: Introduction, conductivity, equivalent conductivity and molar conductivity. Redox reactions, electrode potential and measurement of electrode potential (Nernst equation). Electrochemical series, electrochemical cell and measurement of EMF of electrochemical cell. Concentration cell, **Reference Electrodes:** hydrogen and calomel electrodes. **Batteries:** Introduction, Ni-Cd batteries, Lithium batteries. **Fuel cells:** Introduction, Hydrogen-Oxygen fuel cell, Methanol-Oxygen fuel cell.

UNIT-IV

Corrosion and its Control: Introduction, definition, types of corrosion; dry corrosion, wet corrosion, concentration cell corrosion, galvanic series, galvanic corrosion, pitting corrosion, factors influencing the corrosion. Control of corrosion; cathodic protection, sacrificial anodic protection, impressed current cathodic protection, uses of inhibitors, electroplating and electroless plating.

UNIT-V

Surface Chemistry: Adsorption, types of adsorption, adsorption of gases on solids, adsorption from solutions, applications of adsorption, Langmuir theory of adsorption. Colloids, types of colloidal systems, applications of colloids. Emulsions and micelles.

UNIT-VI

Chemistry of Nanomaterials: Introduction to nanochemistry, classification of nanomaterials, size and scale, units, scaling laws, properties of nanomaterials, methods of synthesis - top down and bottom up methods, sol-gel process, plasma enhanced vapor decomposition process, applications of nanomaterials.

UNIT-VII

Analytical Techniques: Introduction to spectroscopy.
U.V.Visible Spectroscopy: Basic principle, origin of absorption bands, chromophores and their absorption values.
I.R. Spectroscopy: Principle, modes of vibration, group frequencies.
NMR Spectroscopy: Principle, shielding and deshilding of protons, chemical shift and applications of NMR spectroscopy.
Atomic Absorption Spectroscopy: Principle and applications.
Flame photometry: Principle and applications.

UNIT-VIII

Water Technology: Introduction, sources of water, types of impurities in water, hardness of water- temporary and permanent hardness, units of hardness, disadvantages of hard water. Estimation of hardness by EDTA method, boiler troubles.

Softening methods: Internal treatment, external treatment; zeolite process, ion exchange process, desalination of brackish water - reverse osmosis.

TEXTBOOKS :

1. *A Text Book of Engineering Chemistry,* Jain and Jain, Dhanpat Rai Publishing Company, 15th Edition
2. *Engineering Chemistry*, K.N. Jayaveera, G.V.Subba Reddy and C.Ramachandraiah, Tata McGraw Hill Education, 1st Edition
3. *A Text Book of engineering Chemistry,* Shashi Chawla, Dhanpat Rai Publishing Company, 15th Edition

REFERENCE BOOKS:

1. *A Text Book of Engineering Chemistry*, S.S.Dara, S.Chand and Co., 10th Edition
2. *Engineering Chemistry (Vol 1&2),* J.C.Kuriacose and Rajaram, Tata McGraw Hill, 2nd Edition
3. *Chemistry of Engineering Materials*, C.V. Agarval, Tara Publication, 15th Edition
4. *Nanomaterials*, A.K.Bandyopadhyay, New Age International publishers, 2nd Edition
5. *Hand book of Nanostructured Materials and Nanotechnology*, H.S. Nalwa, Volumes – (I to V), Academic press, 2001

B.Tech. I Year

10BT1BS03: ENGINEERING MATHEMATICS

(Common to CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

First Order Differential Equations: Ordinary differential equations of first order and first degree: Linear and Bernoulli type equations, exact equations and reducible to exact. Applications of first order equations to orthogonal trajectories (both cartesian and polar forms), law of natural growth and decay, Newton's law of cooling.

UNIT-II

Higher Order Differential Equations: Non-homogeneous linear differential equations of second and higher order with constant coefficients. Methods of finding the particular integrals for $Q(x)=e^{ax}$, sin ax, cos ax, x^n, $e^{ax}V(x)$, x V(x) and $x^n V(x)$. Method of variation of parameters. Applications to L-R-C circuits, deflection of beams.

Unit-III

Partial Differentiation: Functions of two or more variables, homogeneous functions, total derivatives, derivatives of implicit function, jacobian, errors and approximations, maxima and minima of functions of two variables with and without constraints, Lagranges method of undetermined multipliers.

UNIT-IV

Applications of Derivatives : Radius, centre and circle of curvature, evolutes and envelopes. Tracing of curves in cartesian, parametric and polar forms.

UNIT-V

Laplace Transformations: Laplace transforms of standard functions. Properties of LTs, first and second shifting theorems, LTs of derivatives and integrals, LTs of periodic functions. Unit step function, dirac delta function. Inverse transforms and convolution theorem.

UNIT-VI

Applications of Laplace Transformations : Applications of LTs to ordinary differential equations of first and second order, Heavisides partial fraction expansion theorem.

UNIT-VII

Applications of Integration: Applications of integration to lengths of curves, areas of surfaces and volumes of solids and to surfaces and solids of revolutions. Double and Triple integrals – change of variables, change of order of integration and volume as double integral.

UNIT-VIII

Vector Calculus : Vector differentiation, tangent and normal to curves, gradient, divergence, curl and vector identities. Laplacian operator, vector integration. Line integrals independent of path, work done, conservative field and scalar potential functions. Surface integrals, flux and volume integrals, verifications and applications of vector integral theorems: Greens theorem, Stokes theorem and Gauss divergence theorem (without proof).

TEXTBOOK:

Engineering Mathematics volume-1, T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, S. Chand and Company, 9th Edition

REFERENCE BOOKS:

1. *Higher engineering mathematics*, B.S.Grewal, Khanna publishers, 36th Edition
2. *Advanced Engineering Mathematics*, Erwin Kreyszig, John Wiley & sons, Inc. 8th Edition
3. *Engineering Mathematics for JNTU*, B.V.Ramana, Tata McGraw Hill, 3rd Edition

B.Tech. I Year

10BT10101: ENGINEERING MECHANICS

(for Civil Engineering)

L	T	P	C
3	1	-	6

UNIT–I

Statics of Particles: Basic concepts, system of units, system of concurrent coplanar forces in plane, resultant of forces, laws of mechanics, equilibrium of forces, Lami's theorem, vectorial representation of forces.

UNIT–II

Statics of Rigid Bodies: Moment of a force, Varignon's theorem, moment of a couple, vectorial representation of moments and couples, coplanar non-concurrent forces, equilibrium of rigid bodies, types of supports and loads, principle of virtual work, work done by forces and moments.

UNIT–III

Perfect Frames: Types of frames, free body diagram, degree of indeterminacy, analysis by method of joints and method of sections, tension coefficient method.

UNIT–IV

Friction: Types of friction, frictional force, laws of friction, co-efficient of friction, angle of friction, angle of repose, cone of friction, application, body on horizontal/inclined plane, two bodies in contact, Ladder friction, Screw friction, Belt friction, Wedge friction.

UNIT–V

Centroid and Centre of Gravity: Determination of centroid: method of moments, method of integration, graphical method, theorem of Pappu's, centroid of a line, centroid of a volume, centre of gravity of rigid bodies.

UNIT–VI

Moment of Inertia: Parallel and perpendicular axis theorems, moment of inertia of composite sections, product of inertia, transfer of axes, principal axes of Inertia, mass moment of Inertia.

UNIT–VII

Kinematics of Particles: Basics of dynamics, rectilinear motion, motion with constant acceleration, freely falling bodies, curvilinear motion, motion of a projectile, uniform circular motion, relative motion.

UNIT–VIII

Kinetics of Particles: Kinetics of rectilinear motion, Newton's law of motion, D'Alembert's principle, motion of a lift, motion on an inclined plane, kinetics of circular motion, centrifugal force, super elevation of curves, rotation.

TEXT BOOKS

1. *Engineering Mechanics*, S. S. Bhavikatti and K. G. Rajashekarappa, New Age International (P) Ltd., 3rd Edition
2. *Engineering Mechanics: Statics (Vol. 1), Dynamics (Vol. 2),* J. L. Meriam and L. G. Kraige, John Wiley & Sons Ltd., 5th Edition

REFERENCES

1. *Engineering Mechanics - Statics and Dynamics,* Arthur P. Boresi and Richard J. Schmidt, Cengage Learning, 1st Edition
2. *Engineering Mechanics – Statics and Dynamics*, S. Rajasekaran and G. Sankarasubramanian, Vikas Publishing House Pvt. Ltd., 3rd Edition
3. *Singer's Engineering Mechanics - Statics and Dynamics*, K. Vijaya Kumar Reddy and J. Suresh Kumar, BS Publications, 3rd Edition
4. *Engineering Mechanics*, S. Timoshenko, D. H. Young and J. V. Rao, Tata McGraw-Hill Education Pvt. Ltd., Revised 4th Edition

B.Tech. I Year

10BT1EC01: PROBLEM SOLVING AND COMPUTER PROGRAMMING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
3	1	-	6

UNIT-I

Introduction to Computers: Computer systems, computer hardware, computer software, computing environments, computer languages, writing, editing, compiling and linking programs, program execution, algorithm and flowchart.

Introduction to Problem Solving: The problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.

UNIT-II

Introduction to the C Language: C programs, identifiers, types, variables, types of operators, constants, coding constants, type casting and conversion, formatted input and output. Structure of a C program - expressions, precedence and associativity, evaluation of expressions, mixed type expressions.

UNIT-III

Selection - Making Decisions: Two way selection: if, if-else and nested if-else.

Multi-way selection: else-if ladder and switch statements.

Repetition: concept of loop, pre-test and post-test loops, initialization and updating, event and counter controlled loops, loops in C, break, continue and goto statements.

UNIT-IV

Fundamental Algorithms: Exchanging the values of two variables, counting, summation of a set of numbers, factorial computation, generation of the Fibonacci sequence, reversing the digits of an integer, number base conversion, character to number conversion, the smallest divisor of an integer, greatest common divisor of two integers and generating prime numbers.

UNIT-V

Arrays: Arrays in C, one, two and multidimensional arrays, linear search, binary search, bubble sort, selection sort and insertion sort.

Strings: Concepts, strings in C, string input/output functions, array of strings and string manipulation functions.

UNIT-VI

Functions: Designing structured programs, functions in C, user-defined functions, types of functions, call by value and call by reference, recursion, factorial using recursion, standard library functions, scope, storage classes and preprocessor directives.

Derived Types: Type definition (*typedef*), enumerated types, structure, accessing structures, **Complex Structures:** Nested structures, structures containing arrays, array of structures.

Structures and Functions: Sending individual members, sending the whole structure, unions and bit fields.

UNIT-VII

Pointers: Concepts, pointer variables, accessing variables through pointers, pointer declaration and definition, initialization, pointer arithmetic, array of pointers, pointers to arrays, pointers and functions, pointers to pointers, pointers to structures and memory allocation functions.

UNIT-VIII

Files: Introduction and classification of files, opening and closing of files, read and write operations, conversion of files and command line arguments.

Basic Data Structures: Overview of data structures, implementation of stack operations (push, pop), implementation of linear queue operations (insertion, deletion), circular queues, singly linked list, doubly linked list and circular linked list.

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Pvt. Ltd. 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1EC02: ENGINEERING DRAWING

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	1	3	4

UNIT-I

Scales and Curves :

Scales: Full size, reduced and enlarged scales, representative fraction, plain, diagonal scales, scale of chords.

Curves: Curves used in engineering practice, conic sections-ellipse, parabola and hyperbola, construction-general method only.

UNIT-II

Projections of Points and Lines : Introduction, representation of three dimensional objects, general principles of orthographic projection, importance of multiple views and their placement, first angle and third angle projections, projections of points, two view and three view projections. Projection of lines inclined to one plane, inclined to both the planes, finding true lengths, true inclinations and traces of lines.

UNIT-III

Projections of Planes and Solids : Projections of regular plane surfaces, planes parallel to one plane, planes inclined to one plane and inclined to both the planes, projections on auxiliary planes. Projections of regular solids (prism, cylinder, pyramid and cone), solids inclined to one plane and both planes, auxiliary views.

UNIT-IV

Sections of Solids and Development of Surfaces :

Sections of Solids: Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone. True shapes of the sections.

Development of Surfaces: Right regular solids – prisms, cylinder, pyramids, cone and their sectional parts.

UNIT-V

Isometric Projections : Principles of isometric projections, isometric scale, isometric views, conventions. Isometric views of planes, simple solids. isometric projections of spherical parts. Conversion of isometric views into orthographic views.

UNIT-VI

Perspective Projections : Perspective view of plane figures and simple solids, vanishing point method and visual ray methods.

UNIT-VII

Introduction to Computer Aided Drafting : Introduction to AutoCAD, beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems (cartesian, polar and relative co-ordinate system), introduction to draw commands and modify commands, dimension commands, display commands and miscellaneous commands.

UNIT-VIII

Drafting Of 2D and 3D Figures : Generation of curves, points, lines, polygons, simple solids with dimensioning. Drawing of simple building plans.

TEXTBOOKS:

1. *Engineering Drawing*, P. Khanniah, K.L. Narayana and K. Venkata Reddy, Radiant Publishing House, 2009
2. *Engineering Drawing*, N.D. Bhatt, Charotar Publishing House Private Limited, 2008

REFERENCE BOOKS:

1. *Engineering Drawing*, Johle, Tata McGraw Hill, 2009
2. *Engineering Drawing*, Shah and Rana, Pearson Education, 2nd Edition
3. *Engineering Drawing and Graphics*, K. Venugopal, New age International Publishers, 5th Edition
4. *Computer Aided Engineering Drawing*, Trymbaka Murthy, I.K.International, 1st Edition
5. *AutoCAD,* Shyam Tikko, Autodesk Press, 1st Edition

B.Tech. I Year

10BT1EC03: COMPUTER PROGRAMMING LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

WEEK-1

a. Let a and b are two integer variables whose values are 10 and 13 respectively. Write a program to evaluate the following arithmetic expressions.

i) a + b
ii) a – b
iii) a * b
iv) a / b
v) a % b

b. Write a program that evaluates the following algebraic expressions after reading necessary values from keyword.

i) (ax + b)/(ax – b)
ii) 2.5 log x + Cos 32^0+ | x^2 + y^2| + $\sqrt{}$2xy
iii) x^5 + 10 x^4 + 8 x^3 + 4 x + 2
iv) ae^{kt}

WEEK-2

a. Mr. Gupta deposited Rs.1000 in a bank. The bank gives simple interest at the rate of 15% per annum. Write a program to determine the amount in Mr. Gupta's account at the end of 5 years. (Use the formula I = P T R / 100)

b. A cashier has currency notes of denominations Rs.10, Rs. 50 and Rs. 100. If the amount to be withdrawn is input in hundreds, find the total number of notes of each denomination the cashier will have to give to the withdrawer.

c. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 8000.

WEEK-3

a. Write a program that prints the given 3 integers in ascending order using if - else.

b. Write a program to calculate commission for the input value of sales amount.

Commission is calculated as per the following rules:

i) Commission is **NIL** for sales amount Rs. 5000.

ii) Commission is 2% for sales when sales amount is > Rs. 5000and <= Rs. 10000.

iii) Commission is 5% for sales amount > Rs. 10000.

c. A character is entered through keyboard. Write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A - Z	65 - 90
a - z	97- 122
0 - 9	48 - 57
Special Symbols	0 - 47, 58 - 64, 91- 96, 123 - 127

WEEK-4

a. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit or loss he incurred in percentage.

b. An insurance company calculates premium as follows:

i) If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then premium is Rs.4 per thousand and the policy amount cannot exceed Rs.2 lacks.

ii) If a person satisfies all the above conditions and is female then the premium is Rs.3 per thousand and the policy amount cannot exceed Rs.1 lack.

iii) If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then premium is Rs.6 per thousand and the policy cannot exceed Rs. 10000.

iv) In all other cases the person is not insured.

Write a program to determine whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

WEEK-5

a. Write a program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, %, use switch statement)

b. Write a program to find the grace marks for a student using switch. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following rules:

   i) If the student gets first class and the number of subjects failed in is >3, then no grace marks are awarded.. If the number of subjects failed in is < or = 3 then the grace is 5 marks per subject.

   ii) If the student gets second class and the number of subjects failed in is >2, then no grace marks are awarded. If the number of subjects failed in is < or = 2 then the grace is 4 marks per subject.

   iii) If the student gets third class and the number of subjects failed in is >1, then no grace marks are awarded. If the number of subjects failed in is = 1 then the grace is 5 marks per subject.

WEEK-6

a. Write a program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: The first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

   Write a program to generate the first N terms of the sequence.

c. Write a program to generate all the prime numbers between 1 and N, where N is a value supplied by the user.

WEEK-7

a. Write a program to calculate the following sum:

   $sum=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b. i) A perfect number is a number that is the sum of all its divisors except itself. Six is the perfect number. The only numbers that divide 6 evenly are 1, 2, 3 and 6 (i.e., 1+2+3=6).

ii) An abundant number is one that is less than the sum of its divisors (Ex: 12 <1+2+3+4+6).

iii) A deficient number is one that is greater than the sum of its divisors (Ex: 9 > 1+3).

Write a program to classify N integers (Read N from keyboard) each as perfect, abundant or deficient.

WEEK-8

a. Write a program to find the largest and smallest number in a list of integers.

b. Write a program to perform the following:

i) Addition of two matrices.

ii) Multiplication of two matrices.

WEEK-9

Write a program to perform the following:

i) Linear search ii) Binary search

WEEK-10

Write a program to perform the following:

i) Bubble sort ii) Selection sort iii) Insertion sort

WEEK-11

a. Write a program that uses functions to perform the following operations:

i) To insert a sub-string in main string at a specified position.

ii) To delete N characters from a given string from a specified position.

b. Write a program to determine whether the given string is palindrome or not.

WEEK-12

a. Write a program to display the position or index in the main string S where the sub string T begins. Display –1 if S does not contain T.

b. Write a program to count the number of lines, words and characters in a given text.

WEEK-13

a. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of 1. Ex: 2's complement of 11100 is 00100. Write a program to find the 2's complement of a given binary number using functions.

b. Write a program to convert a roman number in to its decimal equivalent using functions.

WEEK-14

Write programs to perform the following using recursion

i) To find the factorial of a given integer.

ii) To find the GCD (Greatest Common Divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

WEEK-15

Write a program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(**Note**: Represent complex number using a structure.)

WEEK-16

a. Write a program to accept the elements of the structure as:

Employee-name

Basic pay

Display the same structure along with the DA, CCA and Gross salary for 5 employees.

Note: DA=51% of Basic pay, CCA=Rs.100 consolidated.

b. Define a structure to store employee's data with the following specifications:

Employee-Number, Employee-Name, Basic pay, Date of Joining

i) Write a function to store 10 employee details.

ii) Write a function to implement the following rules while revising the basic pay.

If Basic pay <= Rs.5000 then increase it by 15%.

If Basic pay >Rs.5000 and <= Rs.25000 then it increase by 10%.

If Basic pay > Rs.25000 then there is no change in basic pay.

iii) Write a function to print the details of employees who have completed 20 years of service from the date of joining.

WEEK-17

a. Write a program which copies one text file to another.

b. Write a program to reverse the first N characters of a given text file.

Note: The file name and N are specified through command line.

WEEK-18:

Consider the following text file:

Input File:

S.No.	Customer_ID	Item No.	Qty.	Price Per Item (Rs.)
1.	C01	I1	2	10
2.	C02	I2	5	50
3.	C03	I2	5	50
4.	C04	I4	10	10

Write a program to print the output in following format by giving the Customer_ID as an input.

Output:

S.V. PROVISION STORES TIRUPATI		
Customer ID: C01		Date: 12-08-2010
Item	Qty	Price
I1	2	20
Total		20

WEEK-19

Write a program to implement stack operations using:

i) Arrays ii) Pointers

WEEK-20

Write a program to implement linear queue operations using:

i) Arrays ii) Pointers

WEEK-21

Write a program to implement circular queue operations using arrays

WEEK-22

Write a program to implement the following operations on Singly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-23

Write a program to implement the following operations on Doubly Linked List

a. List Creation b. Insertion c. Deletion d. Display

WEEK-24

Write a program to implement the following operations on Circular Linked List

a. List Creation b. Insertion c. Deletion d. Display

TEXTBOOKS:

1. *A Structured Programming Approach using C,* Behrouz A. Forouzan and Richard F. Gilberg, Cengage Learning, 2nd Edition
2. *How to Solve it by Computer*, R.G. Dromey, Pearson Education, 1st Edition

REFERENCE BOOKS:

1. *Classic Data Structures,* D. Samanta, Prentice Hall of India Private Limited, 2004
2. *C and Data Structures*, P. S. Deshpande and O. G. Kakde, WILEY-dreamtech India Private Limited, 2005
3. *Programming in C*, Pradip Dey and Manas Ghosh, Oxford University Press, 2007
4. *C Programming with Problem Solving,* Jacqueline A. Jones and Keith Harrow, Dreamtech Press, 2007

B.Tech. I Year

10BT1BS06: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING PHYSICS LAB

Conduct a minimum of any **Twelve** experiments.

1. I-V characteristics of a P-N Junction diode
2. Characteristics of LED source.
3. Determination of wavelength of a laser source-diffraction grating
4. Determination of particle size by using a laser source
5. Photo diode – characteristics
6. Thermistor characteristics.
7. Hall effect
8. Magnetic field along the axis of a current carrying coil-Stewart and Gee's method.
9. Energy gap of a material of a P-N junction
10. B – H curve
11. Determination of dielectric constant
12. Verification of laws of stretched string – sonometer
13. Melde's experiment- transverse and longitudinal modes
14. Characteristics of laser sources.
15. Determination of numerical aperture of an optical fiber
16. Determination of bending losses of an optical fibre

ENGINEERING CHEMISTRY LAB

Conduct a minimum of any **Ten** experiments.

1. Preparation of standard EDTA and estimation of hardness of water
2. Preparation of standard EDTA and estimation of copper
3. Estimation of alkalinity of water

4. Preparation of standard potassium dichromate and estimation of ferrous iron
5. Preparation of standard potassium dichromate and estimation of copper by iodometry
6. Estimation of iron in cement by colorimetry
7. Conductometric titration of strong acid and strong base.
8. Preparation of phenol-formaldehyde resin.
9. Determination of viscosity of the oils through redwood-viscometer
10. Determination of pH of a given solution by pH metry.
11. Estimation of dissolved oxygen
12. Determination of calorific value of fuel using bomb calorimeter

TEXTBOOKS:

1. *Vogel's Book of Quantitative Inorganic Analysis*, ELBS 5th edition
2. *Chemistry laboratory manual*, K.N. Jayaveera and K.B.Chandra sekhar, S.M. Enterprizes Ltd, 2009.

B.Tech. I Year

10BT1HS02: ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

The following course content is prescribed for the English language laboratory sessions.

1. Introduction to Phonetics.
2. Introduction to Consonants, Vowels and Diphthongs.
3. Introduction to Accent and Rhythm.
4. Functional Grammar.
5. Conversation Starters.
6. Situational Dialogues.
7. Just a Minute (JAM), Elocution, Debate and Impromptu.
8. Story telling.
9. Describing people, places and objects.
10. Movie Review.
11. Public speaking.
12. Presentation Skills.

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD
- The Rosetta stone English Library.
- Clarity Pronunciation Power – Part-I.
- Mastering English in Vocabulary, Grammar, Punctuation and Composition.
- Dorling Kindersley series of grammar, Punctuation, Composition etc.
- Language in use. Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.

- Learning To speak English - 4 CDs.
- Microsoft Encarta CD.
- Murphy's English Grammar, Cambridge with CD
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
- English Pronunciation Dictionary
- Speech Solutions
- Sky Pronunciation
- Tense Buster

B.Tech. I Year

10BT1EC04: ENGINEERING AND IT WORKSHOP

(Common to BOT, CE, ME, CSE, CSSE, ECE, EConE, EEE, EIE and IT)

L	T	P	C
-	-	3	4

ENGINEERING WORKSHOP

1. Trades for Exercise :

a. Carpentry Shop: Two joints: Cross lap joint, mortise and tenon T-joint.

b. Fitting Shop: Two joints: Square joint and V-joint.

c. Sheet Metal Shop: Two jobs: Trapezoidal tray and square tin.

d. House Wiring: Two jobs: Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp.

Earthing: Concept and establishment, safety precautions while house wiring.

e. Foundry: Preparation of two moulds: For a single pattern and a double pattern.

2. Trades for Demonstration:

i. Welding

ii. Metal Cutting

iii. Plumbing

In addition to the above, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, plastics, steels, meters, gauges, equipment, first-aid and shop safety shall be demonstrated through charts, layouts, figures, circuits, CD or DVD.

REFERENCE BOOKS:

1. *Engineering Work shop practice*, V. Ramesh Babu, VRB Publishers Private Limited, 2009
2. *Work shop Manual*, P.Kannaiah and K.L.Narayana, SciTech Publishers, 2009
3. *Workshop Practice Manual*, K. Venkata Reddy, BS Publications, 2008

IT WORKSHOP

PC Hardware :

1. Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.
2. Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.
3. Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.
4. Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.
5. Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007 : MS Word

6. Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

   Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.
7. Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

8. Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

   Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.
9. Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

10. Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

    Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

11. Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

12. Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

    Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

13. Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

14. Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.
15. Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCE BOOKS:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004
5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

II B.Tech. I Semester

10BT3BS04 : MATRICES AND NUMERICAL METHODS

L	T	P	C
4	1	-	4

UNIT – I: MATRICES AND LINEAR SYSTEM OF EQUATIONS

Matrices - algebra of matrices – inverse of a square matrix - rank of a matrix – echelon form – normal form - inverse of a matrix by normal form - symmetric matrix – skew symmetric matrix – Hermitian matrix– Skew Hermitian matrix – unitary matrix – orthogonal matrix, Homogenous and non- homogenous linear systems – consistency and solutions of linear system of equations - direct methods – Gauss elimination method – Gauss-Jordan method.

UNIT – II: EIGEN VALUES AND EIGEN VECTORS

Evaluation of Eigen values – Eigen vectors – properties - Cayley Hamilton theorem (without proof) – inverse and powers of a matrix using Cayley Hamilton theorem – diagonalization.

UNIT – III: SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS AND CURVE FITTING

Solutions of algebraic and transcendental equations by bisection method – false position method – Newton Raphson's method – iterative method - curve fitting by the principle of least squares – fitting of a straight line, Parabola, Exponential and power curves.

UNIT – IV: INTERPOLATION

Interpolation – forward difference operator – backward difference operator – central difference operator – relationship between the operators – Newton's forward formula – Newton's backward formula – interpolation with unequal intervals – Lagrange's interpolation formula.

UNIT – V: NUMERICAL DIFFERENTIATION AND INTEGRATION

Numerical values of derivatives using Newton's forward formula – Newton's backward formula –numerical integration - Trapezoidal rule - Simpsons $1/3^{rd}$ rule – Simpsons $3/8^{th}$ rule.

UNIT – VI: NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS

Numerical solutions of ordinary differential equations using Taylor's method – Euler's modified method – Picard's method – Runge-Kutta method – Milne's predictor corrector method.

UNIT – VII: PARTIAL DIFFERENTIAL EQUATIONS

Formation of partial differential equations - solutions of first order partial differential equation using Lagrange's method - method of separation of variables – solutions of one dimensional wave equation - heat equations.

UNIT – VIII: FOURIER SERIES

Fourier series of functions in (0, 2Pi), (-Pi, Pi), (0, 2l), (-l, l) - determination of Fourier coefficients – Euler's formulae – even and odd functions – periodic continuation – half-range Fourier sine and cosine expansions.

TEXT BOOKS:

1. T.K.V. Iyenger, B. Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad, *Mathematical Methods*, 5th Revised edition, S. Chand Group, New Delhi, 2010.

REFERENCE BOOKS:

1. B.S. Grewal, *Higher Engineering Mathematics*, 40th edition, Khanna Publishers, New Delhi, 2010.
2. Erwin Kreyszig, *Advanced Engineering Mathematics*, 9th edition, John-Wiley & Sons, New Delhi, 2006.
3. S.S. Sastry, *Introductory Methods of Numerical Analysis*, 3rd edition, Prentice Hall of India Pvt. Ltd., 2009.
4. B.V. Ramana, *Mathematical Methods*, 2nd edition, Tata McGraw Hill, 2010.

II B.Tech. I Semester

10BT30301 : STRENGTH OF MATERIALS

L	T	P	C
4	1	-	4

UNIT – I: SIMPLE STRESSES AND STRAINS

Elasticity and plasticity, Types of stresses and principal stresses – Mohr's circle, Strains–Hooke's law, Stress – Strain diagram for mild steel, Working stress, Factor of safety, Lateral strain, Poisson's ratio & volumetric strain, Elastic moduli & relationship between them, Bars of varying section, Composite bars, Temperature stresses, Strain energy – Resilience – gradual, Sudden, Impact and shock loadings.

UNIT – II: SHEAR FORCE AND BENDING MOMENT

Definition of beam-types of beams – concept of shear force and bending moment – S.F and B.M diagrams for cantilever, Simply supported and overhanging beams subjected to point loads, Uniformly distributed loads, Uniformly varying loads and combination of these loads – point of contraflexure – relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – III: FLEXURAL STRESSES

Theory of simple bending – assumptions – derivation of bending equation: M/I = f/y = E/R, Neutral axis – determination of bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – design of simple beam sections.

UNIT – IV: SHEAR STRESSES

Derivation of formula – shear stress distribution across various beams sections like rectangular, Circular, Triangular, I, T angle sections.

UNIT – V: TORSION OF CIRCULAR SHAFTS

Theory of pure torsion - derivation of torsion equations -assumptions made in the theory of pure torsion - torsional moment of resistance-polar section modulus.

SPRINGS: Introduction- types of springs - deflection of closed and open coil helical springs under axial pull and axial couple–springs in series and parallel, Carriage or leaf springs.

UNIT – VI: DEFLECTION OF BEAMS

Bending into a circular arc – slope, deflection and radius of curvature, Differential equation for the elastic line of a beam, Double integration and Macaulay's methods, Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, UDL, Uniformly varying load, Mohr's theorems – Moment Area method– application to simple cases including overhanging beams.

UNIT – VII: THIN CYLINDERS

Thin seamless cylindrical shells–derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and volumetric strains – changes in diameter and volume of thin cylinders – riveted boiler shells – thin spherical shells.

UNIT – VIII: THICK CYLINDERS

Lame's equation – cylinders subjected to inside & outside pressures– compound cylinders.

TEXT BOOKS:

1. S.S. Bhavikatti, *Strength of materials*, Vikas publications.
2. S. Ramamrutham, *Strength of materials*, Dhanpat Rai Publications.
3. E.P. Popov, *Engineering Mechanics of Materials*, PHI.

REFERENCE BOOKS:

1. Jindal, *Strength of Materials*, Umesh Publications.
2. Andrew Pytel and Ferdinand L. Singer, *Strength of Materials*, Longman.
3. Dr. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, *Strength of Materials*, Laxmi Publications.

II B.Tech. I Semester

10BT30224 : BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	P	C
4	-	-	4

PART-A-ELECTRICAL ENGINEERING

UNIT – I: ELECTRICAL CIRCUITS AND CABLES
Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchoff's laws, Inductive networks, Capacitive networks, Series and Parallel circuits, Star-delta and delta-star transformations,Types of cables.

UNIT – II: DC MACHINES
Principle of operation of DC Generator – EMF equation - types of generators – principle of operation of DC motor- motor types – torque equation – applications - three point starter.

UNIT – III: TRANSFORMERS
Principle of operation of single phase transformers – EMF equation –O.C and S.C Tests - losses – efficiency and regulation.

UNIT – IV: AC MACHINES
Principle of operation of alternators – regulation by synchronous impedance method – principle of operation of induction motor–slip–torque characteristics – applications.

TEXT BOOKS:

1. V.K.Mehta, *Principles of Electrical and Electronics Engineering*,S.Chand.
2. M.S Naidu and S. Kamakshaiah, *Introduction to ElectricalEngineering*, TMH.

REFERENCE BOOKS:

1. Thereja .B.L & Thereja A.K, *Electrical Technology*, Vol-II, S.Chand, 2009
2. M. S. Sukhija, T. K Nagsarkar, *Basic Electrical Engineering*, Oxford University Press.
3. Kothari and Nagarath, *Basic Electrical Engineering*, 2nd Edition, TMH Publications.
4. P.S.Bimbhra,*Electrical Machinery*,7th edition,Khanna Publishers,Newdelhi,2005

PART-B-ELECTRONICS ENGINEERING

UNIT-V: DIODE AND ITS CHARACTERISTICS
PN Junction diode, Symbol, V-I characteristics, Diode applications, Rectifiers-Half Wave, Full Wave and Bridge rectifiers (Simple Problems),Filter definition,Classifications of filters,Capacitive filter.

UNIT-VI: TRANSISTORS
PNP and NPN junction Transistor, Transistor as an amplifier, Need for biasing, Single stage CE amplifier, Frequency response of CE amplifier, Necessary conditions for oscillators, RC phase shift oscillator,Crystal oscillator, SCR characteristics and applications.

UNIT-VII: INDUCTION HEATING
Theory of Induction heating, Application in industries.
DIELECTRIC HEATING: Theory of dielectric heating and its industrial applications.
ULTASONICS: Generation, Flow detection and other applications.

UNIT-VIII: CATHODE RAY OSCILLOSCOPE
Principles of CRT (Cathode Ray Tube), Deflection Sensitivity, Electrostatic and magnetic deflection, Applications of CRO-Voltage, Current and frequency measurements.

TEXT BOOKS:

1. R.L.Boylestad and Louis Nashelsky, *Electronic Devices and Circuits*, 9th Edition, 2006, PEI/PHI.
2. G.K.Mittal, *Industrial Electronics*, PHI.
3. Albert D. Helfrick, Willam D. Cooper, *Modern Electronic Instrumentation and Measurement Techniques, Prentice Hall,*

REFERENCE BOOKS:

1. Millman and C.C.Halkias, Satyabratajit, *Electronic Devices and Circuits*, 2nd Edition, 1998, TMH.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2nd Edition, 2005, BSP.

Note: In Basics of Electrical and Electronics Engineering minimum of two questions from each part should be chosen for answering five questions in the end semester examination.

II B.Tech. I Semester

10BT30302: MATERIALS SCIENCE AND METALLURGY

L	T	P	C
4	1	-	4

UNIT – I: STRUCTURE OF METALS
Introduction to Engineering materials - classification, Space lattice & unit cells, Bonds in solids – metallic bond – crystallization of metals, Crystal imperfections - edge and screw dislocations, Grain and grain boundaries, Effect of grain boundaries on properties of metal/alloys, Determination of grain size.

UNIT – II: CONSTITUTION OF ALLOYS
Necessity of alloying, Types of solid solutions, Hume – Rotherys rules, Intermediate alloy phases and electron compounds.

UNIT –III: PHASE DIAGRAMS
Experimental methods of construction of equilibrium diagrams, Isomorphous alloy systems, Equilibrium cooling and heating of alloys, Lever rule, Coring miscibility gaps, Eutectic systems, Congruent melting intermediate phases, Peritectic reaction, Transformations in the solid state – Allotropy, Eutectoid, Peritectoid reactions, Phase rule, Relationship between equilibrium diagrams and properties of alloys, Study of important binary phase diagram of Fe-Fe_3C.

UNIT –IV: CAST IRONS AND STEELS
Structure and properties of White Cast Iron, Malleable Cast Iron, Grey Cast Iron, Spheroidal Graphite Cast Iron, Alloy Cast Irons, Classification of steels, Structure and properties of plain carbon steels, Low Alloy Steels, Hadfield Manganese Steels, Tool and die steels.

UNIT – V: HEAT TREATMENT OF ALLOYS
Effect of alloying elements on Iron–Iron carbon system, Annealing, normalizing, Hardening, TTT diagrams, Tempering, Hardenability, Surface – hardening methods, Age hardening treatment, Cryogenic treatment of alloys.

UNIT – VI: NON-FERROUS METALS AND ALLOYS
Structure and properties of copper and its alloys, Aluminium and its alloys, Titanium and its alloys.

UNIT – VII: CERAMIC MATERIALS
Properties and applications of crystalline ceramics, Glasses, Cermets, Abrasive materials.

UNIT-VIII: POWDER METALLURGY

Introduction-methods of production of metal powders-mixing, Blending, Compacting, Sintering, Hot pressing-applications of powder metallurgy.

TEXT BOOKS:

1. Sidney.H. Avner, *Introduction to Physical Metallurgy*, Tata Mc Graw Hill, New Delhi.
2. Donald R. Askeland, Pradeep .P.Fulay, D.K.Bhattacharya, *Materials Science and Engineering*, Cengage Learning, New Delhi.

REFERENCE BOOKS:

1. V. Raghavan, *Physical Metallurgy: Principles and Practices*, PHI, New Delhi.
2. William.D.Callister, *Materials Science & Engineering-An Introduction*, John Wiley and sons, New Delhi.
3. Kodigre .V .D, *Material Science and Metallurgy*, Everest Publishing House, Pune.
4. B.K.Agarwal, *Introduction to Engineering Materials*, Tata Mc Graw Hill, New Delhi.
5. Flinn.R.A. and P.K.Trojan, *Engineering Materials and Their Applications*, JAICO Publishing House.
6. R.K.Rajput, *Engineering Materials and Metallurgy*, S. Chand.

II B.Tech. I Semester

10BT30303 : THERMODYNAMICS

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION, BASIC CONCEPTS AND DEFINITIONS
System, Control volume, Surrounding, Boundaries, Universe, Types of systems, Macroscopic and Microscopic viewpoints, Concept of continuum, Thermodynamic equilibrium, State, Property, Process, Cycle – reversibility, Quasi – static process, Irreversible process, Causes of irreversibility – energy in state and in transition – types, Work and Heat, Point and path functions.

UNIT – II:ZEROTH AND FIRST LAW OF THERMODYNAMICS
Zeroth law of thermodynamics – concept of quality of temperature– principles of thermometry – reference points – constant volume gas thermometer – scales of temperature, Ideal gas scale – Joule's experiments – first law of thermodynamics – PMM of first kind– corollaries – limitations of first Law – first law applied to a process– applied to a flow system – steady flow energy equation.

UNIT – III:SECOND LAW OF THERMODYNAMICS
Second law of thermodynamics –thermal reservoir, Heat engine, Refrigerator, Heat pump, Parameters of performance – Kelvin-Planck and Clausius statements and their equivalence/corollaries, PMM of second kind- Carnot's principle, Carnot cycle and its specialties and simple problems.

UNIT – IV:ENTROPY AND THIRD LAW OF THERMODYNAMICS
Thermodynamic scale of temperature, Clausius inequality, Entropy, Principle of entropy increase – energy equation, Availability and irreversibility – thermodynamic potentials, Gibbs and Helmholtz functions, Maxwell relations – elementary treatment of the third law of thermodynamics.

UNIT – V:PURE SUBSTANCES
Pure substances, P-V-T surfaces, T-S and h-s diagrams, Mollier charts, Phase transformations – triple point at critical state properties during change of phase, Dryness fraction – Clausius – Clapeyron equation, Constructional use of property tables, Mollier charts – Various thermodynamic processes and energy transfer – steam calorimetry.

UNIT – VI: PERFECT GAS LAWS

Equation of state, Specific and universal gas constants – various non-flow processes, properties, End states, Heat and Work transfer, Changes in internal energy – throttling and free expansion processes – flow processes – deviations from perfect gas model – Vander waals equation of state – compressibility charts – variable specific heats – gas tables.

UNIT – VII: MIXTURES OF PERFECT GASES

Mole Fraction, Mass friction Gravimetric and volumetric Analysis – Dalton's Law of partial pressure, Avogadro's Laws of additive volumes – Mole fraction, Volume fraction and partial pressure, Equivalent gas constant and Molecular Internal Energy, Enthalpy, specific heats and Entropy of mixture of perfect gases and vapour.

UNIT–VIII: PSYCHROMETRY

Atmospheric air – psychrometric properties – dry bulb temperature, Wet bulb temperature, Dew point temperature, Thermodynamic wet bulb temperature, Specific humidity, Relative humidity, Saturated air, Vapour pressure, Degree of saturation – adiabatic saturation, Carrier's equation – psychrometric chart.

TEXT BOOKS:

1. P. K. Nag, *Engineering Thermodynamics*, 3rd Edition, TMH.
2. A. Venkatesh, *Basic Engineering Thermodynamics*, Orient Longman.

REFERENCE BOOKS:

1. Sonntag, Borgnakke and Van Wylen, *Fundamentals of Thermodynamics*, John Wiley & sons.
2. Yunus Cengel & Boles, *Thermodynamics–An Engineering Approach*, TMH.
3. J.P.Holman, *Thermodynamics*, McGrawHill.
4. J.B. Jones, R.E. Dugan, *Engineering Thermodynamics*, PHI.

II B.Tech. I Semester

10BT30304 : MACHINE DRAWING

L	T	P	C
4	2	-	4

I. Machine Drawing Conventions:

Need for drawing conventions – introduction to IS conventions

a) Conventional representation of materials, Common machine components.
b) Types of sectional views–full sectional view and half sectional view-revolved & removed sections-Auxiliary sections ONLY.
c) Dimensioning-notation of dimensioning-Theory of dimensioning-system of placing dimension-unit- general rules for sizes and placement of dimensions for holes, Centers, Curved and tapered features.
d) Representation of limits, Fits and tolerances & form and positional tolerances and machining symbols.
e) Representation of surface finish & roughness symbols indication.

II. Drawing of Machine Elements and simple parts

Selection of views, additional views for the following machine elements and parts with every drawing proportion.

a) Types of thread profiles, Bolted joints, Bolts and other forms of bolts, Nut and other forms of nuts, Set screws, Locking arrangements for nuts, Foundation bolts- Eye, Bent, Rag foundation bolts.
b) Keys, Cotter joints and pin joints (Below mentioned Keys, Cotter joints and pin joints ONLY)
    (i) Keyed joint
    (ii) Hollow saddle key
    (iii) Flat saddle key
    (iv) Key with gib head
    (v) Wood ruff key
    (vi) Cotter joint with sleeve
    (vii) Cotter joint socket and spigot ends
    (viii) Knuckle joint
c) Riveted joints (Below mentioned riveted joints ONLY)
    (i) Types of riveted heads
    (ii) Single riveted lap joint
    (iii) Double riveted chain lap joint
    (iv) Double riveted zig-zag lap joint
    (v) Single riveted, single strap butt joint
    (vi) Double riveted, double strap chain butt joint

d) Shaft coupling & Pipe joints(Below mentioned shaft & pipe joints ONLY)
   (i) Rigid couplings - Butt – Muff coupling, Half lap muff coupling
   (ii) Flanged couplings - Flanged coupling
   (iii) Disengaging couplings - compression coupling
   (iv) Non- aligned couplings - Universal coupling, Oldham coupling.
   (v) Pipe joints- socket and Spigot joint.

III. Assembly Drawings

Drawing of assembled views for the part drawings of the following using conventions and easy drawing proportions. (Below mentioned assembly drawings ONLY)

a) Stuffing box	b) Cross head
c) Eccentric	d) Drill jig
e) Square tool post	f) Screw jack
g) Air cock and	h) Pipe vice

IV. Part Drawings

Preparation of part drawing representing limits fits and tolerances and surface finish indications (Below mentioned part drawings ONLY).

a) Petrol Engine Connecting rod	b) Marine Engine Connecting rod
c) Single tool post	d) Clapper box
e) Revolving centre	f) Plummer block

NOTE: First angle projection to be adopted.

TEXT BOOKS:

1. R.K. Dhawan, *Machine Drawing*, S.Chand Publications.
2. K.L Narayana, P. Kannaiah & K. Venkata Reddy, *Machine Drawing*, New Age Publisher.
3. K.L Narayana, P. Kannaiah & K. Venkata Reddy, *Production Drawing*, New Age Publisher.

REFERENCE BOOKS:

1. P.S.Gill, *Machine Drawing*, Katson Publishing.
2. K.C.John, *Text book of Machine Drawing*, PHI learning, 2009.
3. Sidheshwar, *Machine Drawing*, TMH
4. N.D.Bhatt, V. M. Panchal, *Machine Drawing*, Charotar Publishing House Pvt.

Note: The end exam will be for 4 hours in the following format and all answers should be on the drawing sheet only. Answers on the drawing sheet only will be valued.

All questions (Q1, Q2 & Q3) are to be answered

Q1 – Questions are set from section I & II of the syllabus, 2 out of 4 questions are to be answered with a weightage of 4 marks each – (2x4= 8 marks).

Q2– Questions are set from Section II of the syllabus 2 out of 3 questions to be answered with a weightage of 10 marks each – (2x10=20 marks).

Q3 – One question either from assembly drawing (section-III) or part drawing (Section-IV) with a weightage of 42 marks- (1x42=42 marks).

II B.Tech. I Semester

10BT30232: ELECTRICAL AND ELECTRONICS ENGINEERING LAB

L	T	P	C
-	-	3	2

Any SIX experiments are to conducted from each part

PART – A: ELECTRICAL ENGINEERING LAB

1. Verification of Kirchoff's laws.
2. Study of DC shunt motor starter.
3. Swinburne's test on d.c. shunt machine. (Predetermination of efficiency of a given d.c. shunt machine working as motor and generator).
4. Speed control of d.c. shunt motor by

   a) Armature Voltage control b) Field flux control method
5. Brake test on d.c shunt Motor
6. Magnetization characteristics of dc shunt generator. Determination of critical field resistance.
7. OC and sc tests on single phase transformer (Predetermination of efficiency and regulation at given power factors)
8. Brake test on 3-phase Induction motor (Determination of performance characteristics).
9. Regulation of alternator using synchronous impedence method.

PART – B: ELECTRONICS ENGINEERING LAB

1. Study of CRO (Measurement of Voltage, Frequency and Phase of periodic signals).
2. V–I characteristics of PN junction Diode.
3. Half wave rectifier without capacitive filter.
4. Half wave rectifier with capacitive filter.
5. Full wave rectifier without capacitive filter.
6. Full wave rectifier with capacitive filter.
7. Input and output characteristics of transister in Common Emmiter(CE) configuration.
8. Frequency response of a single stage CE amplifier.
9. Sinusoidal signal generation using RC phase shift oscillator circuit.

Note: Internal and end examinations evaluation will be done separately and the average will be recorded.

II B.Tech. I Semester

10BT30311 : STRENGTH OF MATERIALS AND MATERIALS SCIENCE LAB

L	T	P	C
-	-	3	2

Any SIX experiments from each part are to be conducted

PART-A: MATERIALS SCIENCE LABORATORY

1. Study of metallurgical instruments & microscope.
2. (a)Preparation of mounted specimen using cold setting die.
   (b)Preparation of mounted specimen using hydraulic specimen mounting press.
3. Preparation and study of the microstructure of pure metals (Fe, Cu, Al).
4. Preparation and study of the microstructure of carbon steels(Low carbon steel, medium carbon steel, High carbon steel, case carburized steel)
5. Preparation and study of the microstructure of Non-Ferrous alloys(Al alloy, Cu alloy, Stainless steel)
6. (a) Study of the microstructures of heat treated steels.
   (b) Measurement of hardness of heat treated and untreated steels.
7. Determination of Hardenability of steel by Jominy End Quench Test

PART-B: STRENGTH OF MATERIALS LAB

1. Tensile test on mild steel rod
2. Bending test on
   a. Simple supported beam
   b. Cantilever beam
3. Torsion test
4. Hardness test
   a. Brinell hardness test
   b. Rockwell hardness test
5. Test on springs – tension and compression
6. Compression test
7. Impact test

Note: Internal and end examinations evaluation will be done separately and the average will be recorded.

II B.Tech. II Semester

10BT3BS01 : PROBABILITY AND STATISTICS

L	T	P	C
4	1	-	4

UNIT – I: PROBAILITY AND MATHEMATICAL EXPECTATIONS

Introduction to Probability: Definition of random experiment, events and sample space – definition of probability – addition and multiplication theorems - conditional probability – Baye's theorem – simple problems on Baye's theorem.
Random Variable: Discrete and continuous random variables - distribution function of random variable – properties – probability mass function - probability density function – mathematical expectation – properties of mathematical expectations – mean and variance.

UNIT – II: PROBABILITY DISTRIBUTIONS

Discrete Distributions: Binomial distribution – mean and standard deviations of binomial distribution – Poisson distribution – mean and standard deviations of Poisson distribution – applications.
Continuous Probability Distributions: Uniform distribution – exponential distribution – normal distribution – properties of normal distribution – importance of normal distribution – area properties of normal curve.

UNIT – III: CORRELATION AND REGRESSION

Correlation: Definition - measures of correlation – correlation for bi-variate distribution – rank correlation coefficients.

Regression: Simple linear regression – regression lines and properties.

UNIT – IV: SAMPLING DISTRIBUTIONS

Population and sample – parameter and statistic – sampling distribution of statistic – standard error of statistic – null and alternative hypotheses – type I and II errors – level of significance– critical region –degrees of freedom.

UNIT – V: LARGE SAMPLES TEST OF SIGNIFICANCE

Test of significance for single proportion – test of significance for difference of proportions - test of significance for a single mean - test of significance for difference of means – test of significance for difference of standard deviations.

UNIT – VI: SMALL SAMPLES TEST OF SIGNIFICANE
Student's t-test, f-test for equality of population variance – chi-square test of goodness of test – contingency table – chi-square test for independence of attributes.

UNIT – VII: STATISTICAL QUALITY CONTROL
Introduction – advantages and limitations of statistical quality control – control charts – specification limits X, R, Np and c charts.

UNIT – VIII: QUEUING THEORY
Queuing theory – pure birth and death process – m/m/1 model – problems.

TEXT BOOKS:

1. T.K.V. Iyengar, B. Krishna Gandhi and Others, *Probability and Statistics, 3rd Edition*, S. Chand, New Delhi, 2011.
2. Shahnaz Bathul, *A Text Book of Probability and Statistics*, 2nd Edition, Ridge Publications, Hyderabad.
3. Kandaswamy and Tilagavathy, Probability, *Statistics and Queuing Theory*, 1st Edition,S.Chand Group, New Delhi, 2004.

REFERENCE BOOKS:

1. Miller and John E. Freund, *Probability and Statistics for Engineers*, 7th Edition, Pearson Higher Education, 2010.
2. Ronald E. Walpole, *Probability and Statistics for Engineers and Scientists*, 8th Edition, Pearson Education India, New Delhi, 2007.
3. S.C. Gupta and V.K. Kapoor, *Fundamentals of Mathematical Statistics*, 11th Edition, Sultan and Chand, New Delhi, 2007.
4. S.C. Gupta and V.K. Kapoor, *Fundamentals of Applied Statistics*, 3rd Edition, Sultan and Chand, New Delhi, 2009.

II B.Tech. II Semester

10BT4HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION TO MANAGERIAL ECONOMICS AND DEMAND ANALYSIS

Definition, Nature and scope of managerial economics.

Demand Analysis: Determinants of demand – demand function - law of demand and its exceptions - elasticity of demand – types - measurement and significance of elasticity of demand - demand forecasting and methods of demand forecasting.

UNIT – II: THEORY OF PRODUCTION AND COST ANALYSIS

Production Function: Isoquants and isocosts – input-output relationship - law of returns - internal and external economies of scale.

Cost Concepts: Opportunity vs Out lay costs, Fixed vs Variable costs - Explicit vs Implicit costs - Out of pocket vs Inputted costs – break Even Analysis (BEA) - determination of break even point (simple problems).

UNIT – III: INTRODUCTION TO MARKETS AND PRICING

Market Structure: Types of markets - features of perfect competition - monopoly and monopolistic competition - price and output determination in perfect competition and monopoly.

Pricing: Objectives and policies of pricing – sealed bid pricing - marginal cost pricing - cost plus pricing - going rate pricing - limit pricing - market penetration - market skimming - block pricing – bundling - peak load pricing - cross subsidization - dual pricing - administrated pricing.

UNIT – IV: BUSINESS AND NEW ECONOMIC ENVIRONMENT

Characteristic features of business - features and evolution of sole proprietorship - partnership - joint stock company - new economic policy 1991.

UNIT – V: INTRODUCTION AND PRINCIPLES OF ACCOUNTING

Introduction – concepts – conventions – accounting principles - double entry book keeping – journal – ledger - trial balance (simple problems).

UNIT – VI: FINAL ACCOUNTS

Introduction to final accounts - trading account - profit and loss account and balance sheet with simple adjustments (simple problems).

UNIT – VII: CAPITAL AND CAPITAL BUDGETING

Capital: Significance - Types of capital.

Capital Budgeting : Nature and scope of capital budgeting - features and methods of capital budgeting – pay back period method - accounting rate of return method - internal rate of return method - net present value method and profitability index (simple problems).

UNIT – VIII: COMPUTERIZATION OF ACCOUNTANCY SYSTEM

Manual accounting vs computerized accounting – advantages and disadvantages of computerized account – using accounting software tally: tally features – company creation – account groups – group creation – ledger creation.

TEXT BOOKS:

1. A.R. Aryasri, *Managerial Economics and Financial Analysis*, 3rd Edition, Tata Mc-Graw Hill, New Delhi, 2007.
2. R.Cauvery, U.K. Sudhanayak, M. Girija and R. Meenakshi, *Managerial Economics*, 1st Edition, S. Chand and Company, New Delhi, 1997.

REFERENCE BOOKS:

1. Samba Lalita, *Computer Accounting Lab Work*, 1st Edition, Kalyani Publishers, Ludhiana, 2009.
2. Vershaney and Maheswari, *Managerial Economics*, 19th Edition, Sultan Chand and Sons, New Delhi, 2005.
3. H. Craig Petersen and W. Cris Levis, *Managerial Economics*, 4th Edition, Pearson Education, 2009.
4. Lipsy and Chrystel, *Economics*, 4th Edition, Oxford University Press, New Delhi, 2008.
5. S.N. Maheswari and S.K. Maheswari, *Financial Accounting*, 4th Edition, Vikas Publishing House, 2005.
6. S.P. Jain and K.L. Narang, *Financial Accounting*, 5th Edition, Kalyani Publishers, Ludhiana, 2000.

II B.Tech. II Semester

10BT40301 : KINEMATICS OF MACHINERY

L	T	P	C
4	1	-	4

UNIT – I: MECHANISMS

Elements or links – classification – rigid link, Flexible and fluid link, Types of kinematic pairs – Sliding, Turning, Rolling, Screw And Spherical Pairs – lower and higher pairs – closed and open pairs – constrained motion – completely - partially or successfully constrained and incompletely constrained.

MACHINES: Mechanism and machines – classification of machines – kinematic chain – inversion of mechanism – inversions of various mechanisms – inversions of quadric cycle, Chain – single and double slider crank chains.

UNIT – II: STRAIGHT LINE MOTION MECHANISMS

Exact and approximate copiers and generated types – Peaucellier, Hart and Scott Russul – Grasshopper – Watt. T. Chebicheff and Robert mechanisms and straight line motion, Pantograph.

UNIT – III: KINEMATICS

Velocity and acceleration – motion of link in machine, determination of velocity and acceleration diagrams – graphical method – application of relative velocity method four bar chain.

ANALYSIS OF MECHANISMS: Analysis of slider crank chain for displacement, Velocity and acceleration of slider – acceleration diagram for a given mechanism, Kleins construction, Coriolis acceleration, Determination of Coriolis component of acceleration.

PLANE MOTION OF BODY: Instantaneous center of rotation, Centroids and axodes – Relative motion between two bodies–three centers in line theorem – graphical determination of instantaneous centre, Diagrams for simple mechanisms and determination of angular velocity of points and links.

UNIT – IV: STEERING MECHANISMS

Conditions for correct steering – Davis Steering gear, Ackermans steering gear – velocity ratio.

HOOKE'S JOINT: Single and double Hooke's joint–universal coupling–application–problems.

UNIT – V: CAMS

Introduction to cams and followers – their uses – types of followers and cams – terminology – types of follower motion - uniform velocity – simple harmonic motion and uniform acceleration, Maximum velocity and maximum acceleration during outward and return stroke in the case of uniform velocity, SHM and uniform acceleration.

ANALYSIS OF MOTION OF FOLLOWERS: Roller follower – circular cam with straight, concave and convex flanks.

UNIT – VI:HIGHER PAIRS AND LAW OF GEARING

Higher pairs, Friction wheels and toothed gears – types – law of gearing, condition for constant velocity ratio for transmission of motion, Form of teeth: cycloidal and involute profiles, Velocity of sliding – phenomena of interferences – methods of interference, condition for minimum number of teeth to avoid interference, Expressions for arc of contact and path of contact – introduction to Helical, Bevel and worm gearing.

UNIT – VII: BELT, ROPE AND CHAIN DRIVES

Introduction, Belt and rope drives, Selection of belt drive- types of belt drives-Belts, Materials used for belt and rope drives, Velocity ratio of belt drives, Slip of belt, Creep of belt, Tensions for flat belt drive, angle of contact, Centrifugal tension, Maximum tension of belt, Chains- length, Angular speed ratio, Classification of chains– advantages and disadvantages and applications of chain drives.

UNIT – VIII: GEAR TRAINS

Introduction – train value – types – simple and reverted wheel train – epicyclic gear train, Methods of finding train value or velocity ratio – epicyclic gear train - simple problems.

TEXT BOOKS:

1. S. S. Rattan, *Theory of Machines and Mechanisms*, Tata McGraw Hill Publishers
2. R. S. Khurmi, *Theory of machines*, S. Chand Publications.

REFERENCE BOOKS:

1. Joseph Edward Shigley and John Joseph Uicker, *Theory of Machines and Mechanisms*, Second Edition, McGraw Hill, New York.
2. J.S. Rao and R.V. Dukkipati, *Mechanism and Machine Theory*, 2nd Edition, New age International.
3. Ballaney.P.L, T*heory of Machines and Mechanisms*, Khanna Publishers, New Delhi, 2005.

II B.Tech. II Semester

10BT40302 : THERMAL ENGINEERING – I

L	T	P	C
4	1	-	4

UNIT – I: POWER CYCLES
Otto, Diesel, Dual combustion cycles, Sterling cycle, Atkinson cycle, Ericcson cycle, Lenoir cycle – description and representation on P–V and T-S diagram, Thermal efficiency, Mean effective pressures on air standard basis.

UNIT – II: ACTUAL CYCLES AND THEIR ANALYSIS
Introduction, Comparison of air standard and actual cycles, Time loss factor, Heat loss factor, Exhaust blow down-loss due to gas exchange process, Volumetric efficiency, Loss due to rubbing friction, Actual and fuel-air cycles of CI engines.

UNIT – III: I.C. ENGINES
Classification - working principles, Valve and Port timing diagrams, Air – standard, Air-fuel and actual cycles - engine systems – fuel, Carburetor, Fuel injection system, Ignition, Cooling and lubrication.

UNIT – IV: COMBUSTION IN S.I. ENGINES
Normal combustion and abnormal combustion – importance of flame speed and effect of engine variables – type of abnormal combustion, Pre-ignition and knocking – fuel requirements and fuel rating, Anti knock additives – combustion chamber – requirements, Types.

UNIT – V: COMBUSTION IN C.I. ENGINES
Four stages of combustion – delay period and its importance – effect of engine variables – diesel knock– need for air movement, Suction, Compression and combustion induced turbulence – open and divided combustion chambers and nozzles used – fuel requirements and fuel rating.

UNIT–VI: TESTING AND PERFORMANCE
Parameters of performance - measurement of cylinder pressure, Fuel consumption, Air intake, Exhaust gas composition, Brake power– determination of frictional losses and indicated power – performance test – heat balance sheet and chart.

UNIT – VII: COMPRESSORS
Classification-Positive displacement and rotodynamic machinery– Power producing and power absorbing machines, fan and blower and compressor- Positive displacement and dynamic types- reciprocating and rotary types.

Reciprocating compressors: Principle of operation, Work required, Isothermal efficiency volumetric efficiency and effect of clearance, Stage compression, Undercooling, Saving of work, Minimum work condition for stage compression.

UNIT VIII:ROTARY AND DYNAMIC COMPRESSORS

Rotary (Positive displacement type) Compressors: Roots blower, Vane sealed compressor, Lysholm compressor – mechanical details and principle of working – efficiency considerations.

Dynamic Compressors: Mechanical details and principle of operation, Velocity diagrams and power of centrifugal compressors and axial flow compressors.

TEXT BOOKS:

1. V. Ganesan, *I.C. Engines*, TMH, 3rd Edition, 2008.
2. R.K.Rajput, *Thermal Engineering*, Laxmi Publications, 8th Edition, 2010.
3. R.S. Khurmi & J.K.Gupta, *Thermal Engineering*, S.Chand, 16th Edition, 2008.

REFERENCE BOOKS:

1. Mathur & Sharma, *IC Engines*, Dhanpat Rai & Sons, 2005.
2. Pulkrabek, *Engineering Fundamentals of IC Engines*, Pearson, 2nd Edition, 2004.
3. Rudramoorthy, *Thermal Engineering*, TMH, 2003.
4. Heywood, *I.C. Engines*, McGraw Hill.
5. B.Srinivasulu Reddy, *Thermal Engineering Data Book*, IK International Publications, 2007.
6. B. Yadav, *Thermodynamics & Heat Engines*, Central Book Depot., Allahabad.

II B.Tech. II Semester

10BT30121 : FLUID MECHANICS AND HYDRAULIC MACHINERY

L	T	P	C
4	1	-	4

UNIT – I: PROPERTIES OF FLUIDS AND PRESSURE MEASUREMENT

Dimensions and units: physical properties of fluids- Mass density, Specific weight, Specific volume, Specific gravity, Viscosity, surface tension-capillarity, Bulk modulus, Compressibility – ideal and real fluids – Newtonian and Non Newtonian fluids - vapor pressure and its influence on fluid motion- atmospheric gauge and vacuum pressure – measurement of pressure- piezometer, U-tube and differential manometers.

UNIT – II: FLUID KINEMATICS AND DYNAMICS

Stream line, Path line and streak lines and stream tube, Classification of flows-steady & unsteady, Uniform, Non - uniform, Laminar, Turbulent, Rotational, and irrotational flows - Equation of continuity for one dimensional flow, Surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, Momentum equation and its application of force on pipe bend.

UNIT – III: FLOW THROUGH PIPES AND ITS MEASUREMENT

Reynold's experiment- Darcy Weisbach equation - minor losses in pipes- pipes in series and pipes in paralle l- total energy line - hydraulic gradient line, Measurement of flow: Pitot tube, Venturimeter and orifice meter, Flow nozzle- power transmission through pipes.

UNIT – IV: IMPACT OF JETS

Hydrodynamic force of jets on stationary and moving flat, Inclined and curved vanes, Jet striking centrally and at tip, Velocity diagrams, Work done and efficiency, Flow over radial vanes.

UNIT – V: HYDROELECTRIC POWER STATIONS

Elements of hydro electric power station - types-concept of pumped storage plants - storage requirements, Mass curve, Estimation of power developed from a given catchment area; heads and efficiencies.

UNIT – VI: HYDRAULIC TURBINES

Classification of turbines, impulse and reaction turbines, Construction and working of Pelton wheel, Francis turbine and Kaplan turbine - working proportions, Work done, Efficiencies, Hydraulic design – draft tube theory- functions and efficiency.

UNIT – VII: PERFORMANCE OF HYDRAULIC TURBINES

Geometric similarity, Performance under unit head-specific speed, Characteristic curves, Governing of turbines, Selection of type of turbine, Cavitation, Surge tank, Water hammer.

UNIT – VIII: PUMPS

Classification, Working, Work done – manomertic head- Losses and efficiencies,Specific speed- pumps in series and parallel - performance - characteristic curves, Net positive suction head, Reciprocating pumps-working, Discharge, Slip, Indicator diagrams.

TEXT BOOKS:

1. Modi and Seth, *Fluid Mechanics and Hydraulic Machinery*, 17th edition, Standard book house, 2011.
2. R.K. Rajput, *Fluid Mechanics and Hydraulic Machines*, 4th edition, S.Chand, 2008.

REFERENCE BOOKS:

1. D.S. Kumar, *Fluid Mechanics and Fluid Power Engineering*, 7th edition, Kotaria & Sons, 2009.
2. R.K. Bansal, *Fluid Mechanics and Hydraulic Machinery*, 9th edition, Laxmi publications, 2005.

II B.Tech. II Semester

10BT40303 : MANUFACTURING TECHNOLOGY

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION TO MANUFACTURING PROCESSES
Classification of manufacturing processes, Selection of a process for production.
CASTING: Steps involved in making a casting– types of patterns - patterns and pattern making – materials used for patterns, Pattern allowances, Moulding sand - properties, Moulding tools and equipment – types of moulds, Design of Gating systems.

UNIT – II:SOLIDIFICATION AND DESIGN OF CASTING
Solidification of casting, Risers – types- function and design; Casting design considerations, Special casting processes - centrifugal, Die, Investment, Shell and CO_2 mouldings – casting defects and remedies.
Methods of Melting: Crucible melting and cupola operations.

UNIT – III: WELDING
Classification of welding processes, types of welds and welded joints and their characteristics, Design of welded joints, Welding fluxes and filler rods, Gas welding, Arc welding, Resistance welding, Thermit welding and Plasma arc welding.
CUTTING OF METALS: Oxy – acetylene gas cutting, Water plasma, Cutting of ferrous, Non-ferrous metals.

UNIT – IV:INERT GAS, TIG, MIG AND OTHER WELDING PROCESS
Inert Gas welding- TIG & MIG welding, Friction welding, Induction welding, Explosive welding, Laser welding, Welding defects – causes and remedies, Destructive & Non-destructive testing of welds, Welding allied processes, Soldering & Brazing.

UNIT – V: METAL WORKING PROCESSES
Nature of plastic deformation, Hot working, and cold working, Comparison of properties of cold and hot worked parts.
Rolling: Rolling fundamentals – analysis of rolling processes, Rolling stand arrangements, Rolling passes.

UNIT – VI: FORGING PROCESSES
Principles of forging – tools and dies, Types of forging – smith forging-drop forging - press forging - forging die design - drop forging die design and upset forging die design.

EXTRUSION OF METALS: Basic extrusion process and its characteristics, Hot extrusion and cold extrusion - Forward extrusion and backward extrusion – Impact extrusion, Hydrostatic extrusion.

UNIT - VII:STAMPING,FORMING, COLD AND HOT WORKING

Stamping, Forming and other Cold working processes: Blanking and Piercing–Stamping and coining, Bending and forming, Drawing and its types–wire drawing and tube drawing, Coining, Hot and cold spinning.

UNIT – VIII: ADVANCED MANUFACTURING PROCESSES

Introduction - classification – Mechanical- Thermal - Chemical and Hybrid process, Ultrasonic Machining, Water Jet Machining, Abrasive Jet Machining, Electro Discharge Machining, Laser Beam Machining, Electron Beam Machining, Chemical and Electro Chemical Machining, Laser Assisted Machining.

TEXT BOOKS:

1. P.N. Rao, *Manufacturing Technology*, Vol:1,TMH
2. Hazra Choudhary S.K. and A.K., *Workshop Technology*, Vol:1, Media Promoters and Publishers.
3. Kalpak Jain, *Manufacturing Technology*, Pearson Education.

REFERENCE BOOKS:

1. R.K. Jain, *Production Technology*, Khanna Publishers
2. Lindberg, *Process and Materials of Manufacturing*, Pearson
3. Rosenthal, *Principles of Metal Castings*, McGraw Hill.
4. R.S. Parmar, *Welding Engineering and Technology*, Khanna Publishers
5. V.K. Jain, *Advanced Machining Processes*, Allied Publishers.

II B.Tech. II Semester

10BT40112 : FLUID MECHANICS AND HYDRAULIC MACHINES LAB

L	T	P	C
-	-	3	2

Any TWELVE experiments are to be conducted

1. Calibration of Venturimeter.
2. Calibration of Orifice meter.
3. Determination of coefficient of discharge for small orifice by constant head method.
4. Determination of coefficient of discharge for external mouth piece by variable head method.
5. Calibration of rectangular notch.
6. Calibration of triangular notch.
7. Determination of loss of head due to sudden contraction.
8. Determination of loss of head due to sudden expansion.
9. Determination of friction factor for pipes.
10. Verification of Bernoulli's equation.
11. Impact of jets on vanes.
12. Study of hydraulic pump.
13. Performance test on Pelton wheel turbine.
14. Performance test on Francis turbine.
15. Performance test on Kaplan turbine.
16. Performance test on single stage centrifugal pump.
17. Performance test on multi stage centrifugal pump.
18. Performance test on reciprocating pump.

II B.Tech. II Semester

10BT40311 : MANUFACTURING TECHNOLOGY LAB

L	T	P	C
-	-	3	2

Any TWELVE experiments to be conducted

I. PATTERN & MOULD PREPARATION AND METAL CASTING

1. Preparation of pattern on a wood turning lathe.
2. Preparation of green sand mould using single piece and multi piece pattern with core.
3. Preparation of aluminium casting.

II. SAND TESTING

1. (a) Determination of grain fineness number for sand sample using sieve shaker.
   (b) Estimation of clay content and moisture content in a given sample.
2. Determination of permeability of the given sand specimen.
3. Determination of compression, Shear strength of a given sand specimen using universal sand strength testing machine.

III. WELDING

1. Preparation of lap and butt joint using ARC welding.
2. To study TIG welding equipment and prepare a weld joint.
3. To study resistance welding processes and prepare a spot weld.

IV. MECHANICAL PRESS WORKING

1. Experimentation of Blanking & piercing on a fly press machine.
2. Experiment of bending operation on a fly press machine.
3. Experimentation of deep drawing and extrusion operation on a hydraulic press.

V. PROCESSING OF PLASTICS

1. Study of injection and blow moulding machine.
2. Preparation of a specimen on injection moulding machine.
3. Preparation of a specimen on a blow moulding machine.

II B.Tech. II Semester

10BT40312 : COMPUTER AIDED MACHINE DRAWING (AUDIT COURSE)

L	T	P	C
-	2	-	-

UNIT – I
Managing drafting software and its saving, Printing and documentation, Basic commands for drafting, 2-D representation of diagrams, Introduction to 3D commands.

UNIT – II
Representation of dimensioning on the drawings.

UNIT – III
Conventional representation of materials, Representation of sectional views.

UNIT – IV
Representation of limits, Fits and tolerances & form and positional tolerances and machining symbol, Surface finish & roughness symbols indication.

UNIT – V
Method of drawing machine elements and simple parts - I:Types of thread profiles, Bolted joints, Bolts and other forms of bolts, Nut and other forms of nuts, Set screws, Locking arrangements for nuts, Foundation bolts- Eye, Bent, Rag foundation bolts.

UNIT – VI
Method of drawing machine elements and simple parts - II: Keys, Cotter joints and pin joints.

UNIT – VII
Assembly drawings of machine components.

UNIT – VIII
Part drawing: Preparation of part drawing representing limits, fits and tolerances and surface finish indications.

TEXT BOOKS:

1. S. Trymbaka Murthy, *A Text Book of Computer Aided Machine Drawing*, CBS Publishers, New Delhi, 2007.
2. Goutam Pohit & Goutham Ghosh, *Machine Drawing with AutoCAD*, Pearson Education.
3. Sham Tickoo, *AutoCAD 2006 For Engineers and Designers,* Dream tech publishers, 2005.

III B.Tech. I Semester

10BT3BS02 : ENVIRONMENTAL SCIENCES

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION TO ENVIRONMENTAL SCIENCES

Definition and concept of the term environment – various components of environment – abiotic and biotic – atmosphere – hydrosphere – lithosphere – biosphere – inter relationships – need for public awareness – role of important national and international individuals and organizations in promoting environmentalism.

UNIT – II: NATURAL RESOURCES, CONSERVATION AND MANAGEMENT

Renewable and Non renewable resources and associated problems – forests: deforestation, Causes, Effects and remedies – effects of mining, Dams and river valley projects – case studies; water resources: water use and over exploitation – conflicts over water – large dams – benefits and problems; food resources : world food problems – adverse effects of modern agriculture – fertilizer and pesticide problems; land resources: land degradation – landslides-soil erosion – desertification- water logging – salinity – causes, Effects and remedies; mineral resources: mining – adverse effects; energy resources: growing needs – renewable and non renewable resources – alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and biogas, Nuclear energy, Hydrogen fuel, Solar - impact on environment - sustainable life styles.

UNIT – III: ECOLOGY AND ECOSYSTEMS

Definitions and concepts – characteristics of ecosystem – structural and functional features – producers, consumers and decomposers and food webs – types of ecosystems – forests, Grassland, Desert, Crop Land, Pond, Lake, River and Marine Ecosystems – energy flow in the ecosystem – ecological pyramids – ecological successions.

UNIT – IV: BIODIVERSITY, CONSERVATION AND MANAGEMENT

Introduction – definition and concept of biodiversity – value of biodiversity – role of biodiversity in addressing new millennium challenges – global, National biodiversity – hot spots of biodiversity– threats to biodiversity – man and wild life conflicts – remedial measures – endemic, Endangered and extinct species – in-situ and ex-situ conservation of biodiversity.

UNIT – V: ENVIRONMENTAL POLLUTION AND CONTROL

Definition, Causes, Adverse effects and control measures of air pollution, indoor pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution – solid waste management – causes, Effects, Control and disposal methods – role of individuals in the prevention of pollution – hazards and disaster management – floods – earthquakes – tsunamis – cyclones – landslides – case studies.

UNIT – VI: SOCIAL ISSUES AND THE ENVIRONMENT

Concept of sustainable development – methods of rainwater harvesting – watershed management – waste land reclamation – green cover – green power – green technology – resettlement and rehabilitation of people and related problems – case studies – issues and possible solutions - greenhouse effect and global warming – carbon credits – acid rains – ozone layer depletion – causes, Effects and remedies – consumerism and waste production – environment protection Acts – air (prevention and control of pollution) Act – water Act – forest conservation Act – wild life protection Act – issues involved in the enforcement.

UNIT – VII: HUMAN POPULATION AND ENVIRONMENT

Population growth and its impact on environment – Environmental ethics – family welfare programs – human health: T.B., Cancer, HIV/ AIDS – causes, effects and remedies – occupational health hazards – human rights – important international protocols and conventions on environment.

UNIT-VIII

Field work/Environmentalist's diary/assignments/Seminars.

TEXT BOOKS:

1. Erach Barucha, *Environmental Studies*, 1st Edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies*, 3rd Edition, New Age International Publishers, 2011

REFERENCE BOOKS:

1. Deshwal, *Environmental Studies*, 2nd Edition, Khanna Publications, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies*, 1st Edition, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies*, 2nd Edition, Tata McGraw-Hill, New Delhi, 2010.

III B.Tech. I Semester

10BT50301 : THERMAL ENGINEERING – II

L	T	P	C
4	1	-	4

UNIT – I: BASIC CONCEPTS

Rankine cycle - Schematic layout, Thermodynamic analysis, Concept of mean temperature of heat addition, Methods to improve cycle performance – Regeneration – Reheating - Combined- cycles.

UNIT – II: BOILERS

Classification - working principles-with sketches including fire tube boilers-Lancashire, Locomotive boilers, Water tube boilers - Babcock & Wilcox, Bent tube boilers – mountings - water level indicator, Pressure gauge, Fusible plug, Blow-off cock and accessories – boiler horse power, Equivalent evaporation, Efficiency and heat balance. DRAUGHT: Classification – height of chimney for given draught and discharge, Condition for maximum discharge, efficiency of chimney – artificial draught, Induced and forced draught.

UNIT – III: STEAM NOZZLES

Function of nozzle – applications - types, Flow through nozzles, Thermodynamic analysis – assumptions - velocity of nozzle at exit-ideal and actual expansion in nozzle, Velocity coefficient, Condition for maximum discharge, Critical pressure ratio.

Criteria for design of nozzle shape: Super saturated flow - its effects, Degree of super saturation and degree of under cooling - Wilson line – shock at the exit.

UNIT – IV: IMPULSE TURBINE

Mechanical details – velocity diagram – effect of friction – power developed, Axial thrust, Blade or diagram efficiency – condition for maximum efficiency, De-Laval Turbine - its features, Methods to reduce rotor speed - velocity compounding and pressure compounding, Velocity and pressure variation along the flow – combined velocity diagram for a velocity compounded impulse turbine, Governing of impulse turbine.

UNIT – V: REACTION TURBINE

Mechanical details – principle of operation, Thermodynamic analysis of a stage, Degree of reaction – velocity diagram – Parson's reaction turbine – condition for maximum efficiency, Governing of reaction turbine.

UNIT – VI: STEAM CONDENSERS

Requirements of steam condensing plant, Classification of condensers – working principle of different types – jet, Evaporative and surface condensers – vacuum efficiency and condenser efficiency – air leakage, Sources and its effects, Air pump- cooling water requirement.

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UNIT – VII: GAS TURBINES

Simple gas turbine plant – ideal cycle, Essential components – parameters of performance – actual cycle – regeneration, Inter cooling and reheating – closed and semi-closed cycles – merits and demerits, Brief concept about combustion chambers and turbines of gas turbine plant.

UNIT – VIII: JET PROPULSION

Principle of operation – classification of jet propulsive engines – turbo jet, Turbo prop, Pulse jet – working Principles with schematic diagrams and representation on T-S diagram - thrust, Thrust Power and propulsion efficiency, Thrust augmentation techniques.

Rocket propulsion: Application – working principle – classification – propellant type – thrust – propulsive efficiency – specific impulse – solid and liquid propellant rocket engines.

TEXT BOOKS:

1. R.K. Rajput, *Thermal Engineering*, 8th edition, Laxmi Publications, 2010.
2. P.K.Nag, *Basic and Applied Thermodynamics*, TMH, 2nd edition 2010.
3. R.S.Khurmi & J.S.Gupta, *Thermal Engineering*, S.Chand, 16th edition 2008.

REFERENCE BOOKS:

1. V. Ganesan, *I.C. Engines*, TMH, 3rd edition 2008.
2. Mathur and Sharma, *IC Engines*, Dhanpat Rai & Sons, 2005.
3. B. Srinivasulu Reddy, *Thermal Engineering Data Book*, I.K. International Publications,2007.
4. R. Yadav, *Thermodynamics and Heat Engines*, Central Book Depot.
5. B.S. Reddy and K.H. Reddy, *Thermal Engineering Data Book*, I.K. International.

III B.Tech. I Semester

10BT50302 : DYNAMICS OF MACHINERY

L	T	P	C
4	1	-	4

UNIT – I: STATIC AND DYNAMIC FORCE ANALYSIS

Static force analysis of planar mechanisms, Dynamic force analysis including inertia and frictional forces of planar mechanisms.

UNIT – II: GYROSCOPES

Gyroscopes, Effect of precession motion on the stability of moving vehicles, Gyroscopic forces and couples, Gyroscopic stabilization, Ship stabilization, Stability of four wheel and two wheel vehicles moving on curved paths.

UNIT –III: CLUTCHES

Friction clutches - single disc or plate clutch, Multiple disc clutch, Cone clutch, and centrifugal clutch.

BRAKES AND DYNAMOMETERS: Simple block brakes, Internal expanding brake, Band brake of vehicle, Dynamometers – absorption and transmission types, Prony brake, Rope brake and band brake dynamometers, Belt transmission dynamometer, Torsion dynamometer, Hydraulic dynamometer.

UNIT – IV: TURNING MOMENT DIAGRAM AND FLY WHEELS

Turning moment diagrams for steam engine, I.C. engine and multi cylinder engine, Crank effort - coefficient of fluctuation of energy, Coefficient of fluctuation of speed – fly wheels and their design.

UNIT-V: GOVERNORS

Watt, Porter and Proell governors, Spring loaded governors – Hartnell and Hartung governors with auxiliary springs, Sensitiveness, Isochronisms and hunting – effort and power of a governor.

UNIT – VI: BALANCING OF ROTATING MASSES

BALANCING OF ROTATING MASSES: Single and multiple – single and different planes.

BALANCING OF RECIPROCATING MASSES: Primary, Secondary and higher balancing of reciprocating masses, Analytical and graphical methods, Unbalanced forces and couples – V, Multi cylinder, In -line and radial engines for primary and secondary balancing, Locomotive balancing – Hammer blow, Swaying couple, Variation of tractive force.

UNIT – VII: VIBRATION

Basic features of vibratory systems - elements, Degrees of freedom, Single degree of freedom system, Free Vibration of mass attached to vertical spring – transverse loads, Vibrations of beams with concentrated and distributed loads, Dunkerly's method, Raleigh's method, Whirling of shafts, Critical speeds and torsional vibrations, Simple problems on forced, Damped vibration, Vibration isolation & transmissibility.

UNIT – VIII: PROPERTIES OF VIBRATING SYSTEMS

Flexibility and stiffness matrices, Maxwell's reciprocal theorem, Introduction to multi-degree-of-freedom systems.

VIBRATION MEASUREMENTS AND CONTROL: Selection of measuring instruments – accelerometer – dynamic properties and selection of structural materials for vibration control.

TEXT BOOKS:

1. S.S.Rattan, *Theory of Machines and Mechanisms*, Tata McGraw Hill Publishers.
2. R.S Khurmi, *Theory of Machines*, S.Chand Publications.

REFERENCE BOOKS:

1. Bevan.T, *Theory of Machines*, 3rd Edition, CBS Publishers and Distributors, New Delhi, 2002.
2. Joseph Edward Shigley and John Joseph Uicker, *Theory of Machines and Mechanisms*, 2nd Edition, MGH, New York.
3. J.S. Rao and R.V. Dukkipati, *Mechanism and Machine Theory*, 2nd Edition New Age International.
4. Ballaney.P.L, *Theory of Machines and Mechanisms,* Khanna Publishers, New Delhi, 2005.

III B.Tech. I Semester

10BT50303 : MACHINE TOOLS

L	T	P	C
4	1	-	4

UNIT – I:
Introduction to theory of metal cutting, Different types of metal removal processes, Geometry of single point tool and angles chip formation and types of chips – built up edge and its effects, Chip breakers, Mechanics of orthogonal cutting – Merchant's force diagram, cutting forces – cutting speeds, Feed, Depth of cut, Tool life, Thermal aspects - coolants, Machinability, Economics, Tool materials.

UNIT – II:
Engine lathe – Principle of working, Specifications of lathe – types of lathes – work holders - tool holders – box tools, Taper turning, Thread cutting and attachments for lathes.
Turret and capstan lathes–collet chucks – other work holders–tool holding devices.
Automatic lathes– classification – single spindle and multi spindle automatic lathes.

UNIT – III:
Shaping, Slotting and planing machines – their principles of working – principal parts – specification, Classification, Operations performed, Machining time calculations.

UNIT – IV:
Drilling and Boring Machines – Principles of working, Specifications, Types, Operations performed – tool holding devices – twist drill – boring machines – fine boring machines – jig boring machine, Deep hole drilling machine.

UNIT – V:
Milling machine – Principles of working – specifications – classification of milling machines – principal features of horizontal, vertical and universal milling machines – machining operations, Types of milling cutters– methods of indexing – accessories to milling machines.

UNIT – VI:
Grinding machine – theory of grinding – classification of grinding machine – cylindrical grinding.
Surface grinding machine – tool and cutter grinding machine – special types of grinding machines – grinding wheel, Different types of abrasives – bonds, specification and selection of a grinding wheel.

UNIT – VII:
Lapping, Honing and Broaching machines –super finishing, Polishing, Buffing operations.

UNIT – VIII:
Principles of design of Jigs and Fixtures and uses, Classification of Jigs & Fixtures – principles of location and clamping – types of clamping & work holding devices, Typical examples of jigs and fixtures.

TEXT BOOKS:

1. Hazra Choudary S.K. and A.K., *Workshop Technology*, Vol II, Media Promoters.
2. R.K. Jain and S.C. Gupta, *Production Technology*, Khanna Publishers.
3. G.R.Nagpal, *Tool Engineering and Design*, Khanna Publishsers, 2004.

REFERENCE BOOKS:

1. C.Elanhezhian and M. Vijayan, *Machine Tools*, Anuradha Agencies Publishers.
2. Kalpakzian, *Manufacturing Technology*, Pearson
3. H.M.T. (Hindustan Machine Tools), *Production Technology*,
4. Date, *Introduction to Manufacturing Technology*, Jaico Publishing House.

III B.Tech. I Semester

10BT50304 : DESIGN OF MACHINE ELEMENTS – I

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION
Design philosophy-types of design, General considerations of design, design process, Selection of Engineering Materials – properties, Manufacturing considerations in the design, BIS codes of materials, Preferred numbers.

UNIT – II: STRESSES IN MACHINE MEMBERS
Simple stresses, Combined stresses, Torsional and bending Stresses, Impact stresses, Stress - Strain relation, Various theories of failure, Factor of safety, Design for strength and rigidity, Concept of stiffness in tension- Bending, Torsion and Combined cases.

UNIT – III: STRENGTH OF MACHINE ELEMENTS
Stress concentration, Notch sensitivity, Design for fluctuating stresses, Endurance limit, Estimation of Endurance strength, Goodman's line and Soderberg's line.

UNIT – IV: RIVETED JOINTS
Types of riveted joints, Design of riveted joints, Boiler shell riveting, Eccentric loading.

UNIT –V: BOLTED JOINTS
Forms of Screw threads, Stresses in Screw fasteners, Design of bolts with pre-stresses, Design of joints under eccentric loading, Bolts of uniform strength.

UNIT – VI: COTTERS AND KNUCKLE JOINTS
Design of Cotter joints - spigot and socket, Sleeve and cotter, Jib and cotter joints, Knuckle joints.

UNIT – VII: SHAFTS
Design of solid and hollow shafts for strength and rigidity, Design of shafts for combined bending and axial loads, Shaft sizes – BIS code.

UNIT – VIII: KEYS AND COUPLINGS
Design of Keys and Keyways, Design of Rigid couplings - Muff, Split muff and Flange couplings, Flexible couplings.

TEXT BOOKS:

1. Hall, Holowenko, Laughlin, *Machine design*, Schaum Series, Fifth edition, 2011.
2. Pandya & Shah, *Machine design*, Charotar publications, 17th edition, 2009.
3. R.K.Jain, *Machine Design*, Khanna Publications.
4. V.B.Bhandari, *Design of Machine Elements*, Tata McGraw Hill publication, Third edition, 2010.

REFERENCE BOOKS:

1. J.E.Shigley, *Machine design*, Pearson, Second edition, 2009.
2. R S Khurmi and J K Gupta, *Machine design*, S.Chand, 2012.
3. M.F.Spotts, *Design of Machine Elements*, PHI, 2004.
4. Kannaiah, *Machine Design*, Scitech.

NOTE: Design data books are not permitted in the examinations. The design must not only satisfy strength criteria but also rigidity criteria.

III B.Tech. I Semester

10BT50305 : INDUSTRIAL ENGINEERING AND MANAGEMENT

L	T	P	C
4	-	-	4

UNIT – I: PRINCIPLES OF MANAGEMENT

Concepts of Management and Organization,Evolution of management thought - Taylor's scientific management- Fayol's principles of management, Systems approach to management-functions of management , Planning, Organizing, Staffing, Controlling and Directing.

UNIT – II: FACILITIES PLANNING

Plant location-definition- factors affecting the plant location-comparison of rural and urban sites-Methods for selection of plant-matrix approach, Plant layout – definition, Objectives, Types of production, Types of plant layout – various data analyzing forms-Travel chart.

UNIT – III: WORK STUDY

Definition, Objectives, Method study - definition, Objectives, Steps involved- various types of associated charts-difference between micro-motion and memo-motion studies, work measurement-definition, Time study, Steps involved-equipment, Different methods of performance rating- allowances, Standard time calculation, Work sampling – definition, Steps involved, Standard time calculations, Differences with time study- applications.

UNIT – IV: MATERIALS MANAGEMENT

Objectives, Inventory – functions, Types, Associated costs, Inventory classification techniques, Stores management and stores records, Purchase management, Duties of purchase manager, Associated forms, Value Analysis.

UNIT – V: STATISTICAL PROCESS CONTROL

Pareto diagram, Process flow diagram, Cause and effect diagram, Check sheets, Histogram, Scatter diagram, Control charts, State of control, Out of control process, Process capability, Measurement system analysis,Acceptence sampling.

UNIT – VI: PLANT MAINTENANCE AND RELIABILITY

Plant maintenance-objectives of plant maintenance-importance of plant maintenance- organization of maintenance department-types of maintenance- breakdown Maintenance, Scheduled Maintenance, Preventive Maintenance, Predictive Maintenance- recent Developments in Plant Maintenance. Reliability-definition, MTBF, Failure rate, Common failure rate curve, Types of failure, Series, parallel and series-parallel device configurations, Redundancy.

UNIT – VII: ENTREPRENEURSHIP AND PROFESSIONAL ETHICS

Meaning of Entrepreneur-Evolution of the concept- Functions of Entrepreneur- Entrepreneurial Decision process- entrepreneurship Barriers, Professional Ethics- Professional code of conduct, Professional rights, Engineering Ethics: scope and aim of Engineering Ethics - senses of Engineering Ethics - variety of moral issues, Rights of Engineers- Professional rights.

UNIT – VIII: HUMAN RESOURCE MANAGEMENT

Functions of HRM, Job evaluation, Different types of evaluation methods, Job description, Merit Rating- difference with job evaluation, Different methods of merit ratings, Wage incentives and different types of wage incentive schemes.

Industrial safety, Factories Act, Workmen compensation Act, Industrial disputes Act.

TEXT BOOKS:

1. Amrine, *Manufacturing Organization and Management*, Pearson.
2. O.P. Khanna, *Industrial Engineering and Management*, Dhanpat Rai.

REFERENCE BOOKS:

1. Stoner, Freeman, Gilbert, *Management*, 6th Edition, Pearson Education.
2. Besterfield et al., *Total Quality Management*, Pearson Education.
3. Pannerselvam, *Production and Operations Management*, PHI.
4. Ralph M Barnes, *Motion and Time Studies*, John Wiley and Sons.
5. Chase, Jacobs, Aquilano, *Operations Management*, TMH 10th Edition.

III B.Tech. I Semester

10BT50311 : MACHINE TOOLS LAB

L	T	P	C
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Any TWELVE experiments to be conducted

1. Demonstration of construction & operations of general purpose machines: Lathe, Drilling machine, Milling machine, Shaper, Planing machine, Slotting machine, Cylindrical Grinder, Surface grinder and Tool & cutter grinder.
2. Step turning operation.
3. Taper turning operation.
4. Eccentric turning operation.
5. Right hand threading.
6. Square threading.
7. Multiple operations on capstan lathe.
8. Drilling, reaming and tapping & external threading using die.
9. Shaping and planing operations.
10. Slotting operation.
11. Cylindrical surface grinding operation.
12. Gear cutting operation.
13. End milling operation.
14. Surface grinding and Centerless grinding operation.
15. Grinding of tool angles on a cutting tool.

III B.Tech. I Semester

10BT50312 : THERMAL ENGINEERING LAB

L	T	P	C
-	-	3	2

Any TWELVE experiments are to be conducted

1. Valve / Port Timing Diagrams of an I.C. Engine.
2. Performance Test on a 4 -Stroke Diesel Engine.
3. Performance Test on 2-Stroke Petrol engine.
4. Evaluation of Engine friction by conducting Morse test on 4-Stroke Multi cylinder Engine.
5. Retardation and motoring test on 4- stroke engine.
6. Heat Balance of an I.C. Engine.
7. Air/Fuel Ratio and Volumetric Efficiency of an I.C. Engine.
8. Performance Test on Variable Compression Ratio Engines, economical speed test.
9. Performance Test on Reciprocating Air – compressor Unit.
10. Study of Boilers.
11. Determination of flash and fire points of various fuels and lubricants using Abel's, Pensky Martin's and Cleveland's apparatus.
12. Dismantling / Assembly of Engines to identify the parts and their position in an engine.
13. Determination of calorific value of solid and liquid fuels using Bomb calorimeter.
14. Determination of calorific value of gaseous fuels by using Junker's colorimeter.
15. Flue gas analysis by Orsat's, and latest electronic instruments.

III B.Tech. I Semester

10BT50313 : **MATLAB**
(AUDIT COURSE)

L	T	P	C
-	2	-	-

UNIT – I
Introduction: Starting & quitting MATLAB, Displaying windows, entering commands

UNIT – II
Basic features, script M-files, Basic arithmetic operations in MATLAB

UNIT – III
Arrays: Row vector, column vector, matrix, addressing arrays, adding elements to a vector or a matrix, deleting elements, built-in functions, multidimensional arrays, and logical operators, Matrix algebra.

UNIT – IV
Script files and function files in MATLAB

UNIT – VI
Programming in MATLAB

UNIT – VI
Graphics: Basic 2-D plots, 3-D plots, Handle graphics, saving and printing graphics, animation.

UNIT – VII

Problem solving of Tutorial problems on Engineering Mechanics.

Problem solving of Tutorial problems on Mechanical Vibrations.

Problem solving of Tutorial problems on Kinematics of Machinery.

UNIT – VIII
Simple Optimization Problem solving using Genetic algorithm and simulated annealing on MATLAB.

TEXT BOOKS:

1. Amos Gilat, *Matlab: An Introduction With Applications*, Wiley Publications.
2. Rao V. Dukkipati, *Matlab: An Introduction With Applications,* New Age International.
3. Rao V. Dukkipati, *MATLAB for Mechanical Engineers, New Age Science*

III B.Tech. II Semester

10BT60301 : OPERATIONS RESEARCH

L	T	P	C
4	1	-	4

UNIT – I:
OR methodology, Definition of OR, Application of OR to Engineering and Managerial problems, Features of OR models, Limitations of OR.
ALLOCATION: Linear Programming Problem Formulation – graphical solution – simplex method –artificial variables techniques -two–phase method, Big-M method – duality Principle-economic interpretation of duality.

UNIT – II: TRANSPORTATION PROBLEM
Formulation – optimal solution, Unbalanced transportation problem –degeneracy, Transshipment problem - assignment problem – formulation – optimal solution - variants of assignment Problem.

UNIT – III: REPLACEMENT
Introduction – replacement of items that deteriorate with time – when money value is not considered and considered – replacement of items that fail completely, Group replacement.

UNIT – IV: WAITING LINES
Introduction – single channel – poisson arrivals – exponential service times – with finite queue length and non finite queue length models– multichannel – poisson arrivals – exponential service times with finite queue length and non finite queue length models.

UNIT – V: PROJECT MANAGEMENT USING NETWORK ANALYSIS
Network construction, Determination of critical path and duration, floats, PERT- Estimation of project duration, Variance, CPM - elements of crashing, Least cost project scheduling.

UNIT – VI: INVENTORY MODELS
Factors involved in inventory problem analysis, Inventory costs and deterministic inventory control models – single item inventory control models: without shortages, with shortages, with quantity discounts.

UNIT – VII: DECISION ANALYSIS

Decision making under certainty, Decision making under risk – expected value of perfect information and imperfect information, Decision tree and decision making under uncertainty – Hurwicz criterion, Laplace criterion and savage criterion, Analytic Hierarchy Process.

UNIT – VIII: THEORY OF GAMES

Introduction – minimax (maximin) criterion and optimal strategy – solution of games with saddle points – rectangular games without saddle points – 2 X 2 games – dominance principle– m X 2 & 2 X n games - graphical method.

TEXT BOOKS:

1. Hamdy A Taha, *Introduction to Operations Research*, PHI.
2. Kanti Swarup, P.K. Gupta, Manmohan, *Operations Research*, Sultan Chand Publications.
3. J.K. Sharma, *Operations Research*, Macmillan.

REFERENCES

1. A.M. Natarajan, P.Balasubramani, A. Tamilarasi, *Operations Research*, Pearson.
2. R.Panneerselvam, *Operations Research*, PHI.
3. Hiller & Libermann, *Introduction to Operations Research*, TMH.
4. Wayne L. Winston, *Operations Research*, Thomson Brooks, Cole.
5. P.K.Gupta and D.S. Hira, *Operations Research*, S.Chand.

III B.Tech. II Semester

10BT60302 : METROLOGY AND MEASUREMENTS

L	T	P	C
4	-	-	4

UNIT – I: STANDARDS OF MEASUREMENT

Definition and Objectives of metrology, Standards of length - international prototype meter, Imperial standard yard, Wave length standard, Subdivision of standards, Line and end standard, Comparison, Transfer from line standard to end standard, Calibration of end bars (Numerical), Slip gauges, (M-87, M-112), Wringing phenomena.

UNIT – II: SYSTEM OF LIMITS, FITS, TOLERANCES AND GAUGING

Definition of tolerance, Principle of inter changeability and selective assembly, Concept of limits of size and tolerances, Compound tolerances, Accumulation of tolerances, Definition of fits, Types of fits, Hole basis system, Shaft basis system, Classification of gauges, Types of plain gauges - plug gauge- ring gauge - snap gauge.

UNIT – III: COMPARATORS AND ANGULAR MEASUREMENT

Introduction to Comparator, Characteristics, Classification of comparators, Mechanical comparators - sigma Comparators, Solex Comparators, Optical Comparators, LVDT, Introduction to angular measurements, Bevel Protractor, Sine Principle, Sine bar, Sine center, Angle gauges.

UNIT – IV: INTERFEROMETERY, SCREW THREAD MEASUREMENT

Interferometer Principle of Interferometry, Autocollimator, Optical flats, Terminology of screw threads, Measurement of major diameter, Minor diameter, Pitch, Angle and effective diameter of screw threads by 2-wire and 3-wire methods, Tool makers microscope.

UNIT – V: MEASUREMENTS AND MEASUREMENT SYSTEMS

Definition, Significance of measurement, Generalized measurement system, Definition and concept of accuracy, Precision, Sensitivity, Calibration, Threshold, Hystersis, Repeatability, linearity, Loading effect, System response, Time delay, Uncertainity, Introduction to Transducers, Transfer efficiency, Primary and secondary transducers, Mechanical, Electrical, Electronic transducers, Advantages of each type of transducer.

UNIT – VI: MEASUREMENT OF FORCE, TORQUE AND PRESSURE
Force Measurement-principle, Analytical balance, Platform balance, Proving ring, Torque measurement - prony brake, Hydraulic dynamometer, Pressure Measurements - principle, piezoelectric transducers, Electrical resistance pressure gauges, Mcleod gauge.

UNIT – VII: TEMPERATURE AND STRAIN MEASUREMENT
Temperature measurements-Resistance thermometers, Thermocouple, Applications,Laws of thermocouple, Materials and construction of thermocouple, Pyrometer, Spectral-band pyrometer. Strain Measurements- Strain gauge, Preparation and mounting of strain gauges, Gauge factor, Methods of strain measurement.

UNIT – VIII: DYNAMIC CHARACTERISTICS OF INSTRUMENT SYSTEMS
Dynamic behaviour, Mathematical models of system, Time constant, Mechanical and thermal systems. Transfer functions, Orders of a system, Zero order, First order system.

TEXT BOOKS:

1. M. Mahajan, *A Text-Book of Metrology*, Dhanpat Rai & Co., New Delhi.
2. Thomas G. Beckwith, Roy D. Maragoni, John H. Lienhard V, *Mechanical Measurements*, Pearson Education International.

REFERENCE BOOKS:

1. I.C. Gupta, *A Text-Book of Engineering Metrology*, Dhanpat Rai & Co., New Delhi.
2. R.K.Jain, *Engineering Metrology*, Khanna Publishers, New Delhi.
3. Ernest O.Doblin, *Measurements Systems Applications and Design*, Tata Mc GrawHill, New Delhi.
4. Alsutko, Jerry.D.Faulk, *Industrial Instrumentation*, Thompson Asia Pvt.Ltd.

III B.Tech. II Semester

10BT60303 : HEAT TRANSFER

L	T	P	C
4	1	-	4

UNIT – I

Introduction: Modes and mechanisms of heat transfer – basic laws of heat transfer – general applications of heat transfer.

Conduction Heat Transfer: Fourier rate equation – general heat conduction equation in Cartesian, Cylindrical and Spherical coordinates.

UNIT – II

Simplification and forms of the field equation – steady - unsteady and periodic heat transfer – boundary and initial conditions.

One Dimensional Steady State Heat Conduction: In Homogeneous slabs, Hollow cylinders and spheres – overall heat transfer coefficient – electrical analogy – critical radius/thickness of insulation-with variable thermal conductivity – with internal heat sources or heat generation, Extended surface (fins) Heat Transfer – long Fin, Fin with insulated tip and Short Fin, Application to errors in Temperature measurement.

UNIT – III

One Dimensional Transient Heat Conduction in systems with negligible internal resistance – significance of Biot and Fourier numbers - chart solutions of transient conduction systems- problems on semi-infinite body.

UNIT – IV

Convective Heat Transfer: Dimensional analysis–buckingham theorem and its application for developing semi – empirical non-dimensional correlations for convective heat transfer – significance of non-dimensional numbers – concepts of Continuity, Momentum and Energy Equations.

UNIT – V

Forced convection: External Flows: Concepts of hydrodynamic and thermal boundary layer and use of empirical correlations for convective heat transfer for flow over-flat plates, Cylinders and spheres.

Internal Flows: Division of internal flow through Concepts of Hydrodynamic and thermal entry lengths – use of empirical relations for convective heat transfer in horizontal pipe flow, Annular flow.

Free Convection: Development of hydrodynamic and thermal boundary layer along a vertical plate – use of empirical relations for convective heat transfer on plates and cylinders in horizontal and vertical orientation.

UNIT – VI:
Heat Transfer with Phase Change: Boiling: Pool boiling – regimes, Determination of heat transfer coefficient in Nucleate boiling, Critical heat flux and film boiling.
Condensation: Film wise and drop wise condensation –Nusselt's theory of condensation on a vertical plate - film condensation on vertical and horizontal cylinders using empirical correlations.

UNIT – VII
Heat Exchangers: Types - tube arrangements, Single & Multi tube types, Parallel, Counter & Cross flow heat exchangers – overall heat transfer Coefficient and fouling factor – concepts of LMTD and NTU methods - problems using LMTD and NTU methods.

UNIT – VIII
Radiation Heat Transfer **:** Emission characteristics and laws of black-body radiation – irradiation – total and monochromatic quantities– laws of Planck, Wien, Kirchoff, Lambert, Stefan and Boltzmann – heat exchange between two black bodies – concepts of shape factor – emissivity – heat exchange between gray bodies – radiation shields.

TEXT BOOKS:

1. R.C. Sachdeva, *Fundamentals of Engineering Heat and Mass Transfer*, 4th edition, New Age International.
2. Kondandaraman, C.P., *Fundamentals of Heat and Mass Transfer*, 3rd edition, *New Age International*, 2006.
3. R.K.Rajput, *Heat and Mass Transfer*, S.Chand & Company Ltd.

REFERENCE BOOKS:

1. P.K.Nag, *Heat Transfer,* 2nd edition, TMH, 2010
2. Holman.J.P, *Heat Transfer*, 9th edition, TMH, 2010
3. Incropera, *Fundamentals of Heat Transfer*, 7th edition, Wiley India.
4. Ghoshdastidar, *Heat Transfer*, Oxford University Press, 2004
5. B.S.Reddy and K.H.Reddy, *Thermal Engineering Data Book*, I.K. International.
6. Yunus Cengel, *Heat And Mass Transfer*, Mc Graw Hill Publications

Codes/Tables: Thermal Engineering Data Book to be supplied in Exams.

III B.Tech. II Semester

10BT60304 : CAD / CAM

L	T	P	C
4	-	-	4

UNIT – I:INTRODUCTION TO CAD/CAM
Introduction to CAD/CAM, Conventional CAD process – advantages and disadvantages, Computers in Industrial Manufacturing, Product cycle, CAD/CAM Hardware, Basic structure, CPU, Memory types, Input devices, Display devices, Hard copy devices and storage devices.

UNIT – II: COMPUTER GRAPHICS & DRAFTING
Raster scan graphics coordinate system, Database structure for graphics modeling, Transformation of geometry, 3D transformations, Geometric commands, Layers, Display control commands, Editing, Dimensioning.

UNIT – III: GEOMETRIC MODELING
Requirements, Geometric models, Geometric construction models, Curve representation methods, Surface representation methods, Modeling facilities desired.

UNIT – IV: NUMERICAL CONTROL
NC, NC modes, NC elements, NC machine tools, Structure of CNC machine tools, Features of Machining center, Turning center, CNC Part Programming - fundamentals, Manual part programming methods, Computer Aided Part Programming.

UNIT – V: GROUP TECHNOLOGY
Part family, Coding and classification, Production flow analysis, Advantages and limitations, Computer Aided Processes Planning, Retrieval type and Generative type.

UNIT – VI: TYPES OF MANUFACTURING SYSTEMS
Automated Manufacturing Systems, Flexible Manufacturing Systems(FMS), Material handling systems-types and applications, computer control systems, JIT, Human labor in manufacturing systems.

UNIT – VII: COMPUTER INTEGRATED PRODUCTION PLANNING
Capacity planning, Shop floor control, MRP-I, MRP-II, CIMS benefits.

UNIT – VIII: COMPUTER AIDED QUALITY CONTROL
Terminology in quality control, The computer in QC, Contact inspection methods, Non-contact inspection methods-Optical non-contact inspection methods, Non-optical computer aided testing.

TEXT BOOKS:

1. Ibrahim Zeid, *CAD/CAM Theory and Practice*, Mc Graw Hill.
2. A Zimmers & P.Groover, *CAD/CAM*, PHI
3. P.N. Rao, *CAD/CAM-Principles and Applications*, TMH

REFERENCE BOOKS:

1. Mikell P. Groover, Automation, *Production systems & Computer Integrated Manufacturing*, Prentice Hall
2. Radhakrishnan and Subramaniah, *CAD/CAM/CIM*, New Age International
3. Farid Amirouche, *Principles of Computer Aided Design and Manufacturing*, Pearson
4. R. Sivasubramaniam, *CAD/CAM Theory and Practice*, TMH
5. Lalit Narayan, *Computer Aided Design and Manufacturing*, PHI.
6. T.C. Chang, *Computer Aided Manufacturing*, Pearson
7. C.S.P. Rao, *A Text Book of CAD/CAM*, Hitech Publishers.

III B.Tech. II Semester

10BT60305 : DESIGN OF MACHINE ELEMENTS – II

L	T	P	C
4	1	-	4

UNIT – I: DESIGN OF CURVED BEAMS

Introduction- stresses in curved beams- expression for radius of neutral axis for rectangular, Circular, Trapezoidal and T-section, Design of crane hooks, C – clamps.

UNIT – II: DESIGN OF POWER SCREWS

Design of screw, Square ACME, Buttress screws- efficiency of the screw, Design of nut, Compound screw, Differential screw, Ball screw- possible failures.

UNIT – III: POWER TRANSMISSION SYSTEMS

Design of flat belt drives, V-belt drives & rope drives. Selection of wire ropes,.

UNIT – IV: JOURNAL BEARINGS

Lubricants, Types of lubrication, Hydrodynamic and hydrostatic lubrication, Bearing modulus, Friction circle, Bearing characteristic number, McKee's equation, Sommerfeld number, Types of journal bearings, Full and partial journal bearings, Clearance ratio, Bearing materials, Journal bearing design, Bearing life, Failure of bearings.

UNIT – V: ANTI FRICTION BEARINGS

Ball and Roller Bearings, Nominal life, Average life, Static load, Dynamic load, Equivalent radial load, Design and Selection of ball and roller rearings.

UNIT – VI: DESIGN OF SPUR AND HELICAL GEARS

Classification of gears, Gear terminology, Design of spur, Helical gears, Lewis equation - bending strength, Buckingham dynamic load equation, Wear strength equation.

UNIT – VII: MECHANICAL SPRINGS

Stress and deflections of helical springs-springs for fatigue loading – natural frequency of helical springs-energy storage capacity- helical torsion springs - leaf springs-coaxial springs.

UNIT – VIII: DESIGN OF I.C ENGINE PARTS

Design of connecting rod, Design of piston for IC engine, Design of crank and crankshafts, Introduction to Optimum design.

TEXT BOOKS:

1. V.B.Bhandari, *Design of Machine Elements*, TMH
2. R.K.Jain, *Machine Design*, Khanna Publications.
3. Pandya and Shah,*Machine Design*, Charotar Publishing House,17th edition, 2009.

REFERENCE BOOKS:

1. JE Shigley, *Mechanical Engineering Design*, McGraw Hill.
2. Data Books : (i) P.S.G. College of Technology (ii) Balaveera Reddy and Mahadevan
3. T.V.Sundaramoorthy & N.Shanmugam, *Machine Design*
4. Kannaiah, *Machine Design*, Scitech Publishers
5. R.S. Khurmi & J.S.Gupta, *Machine Design*, S.Chand

Data Hand Book

Mahadevan and Balaveera Reddy, *Machine Design Data Hand Book*, CBS Publishers, New Delhi.

III B.Tech. II Semester

10BT60306 : AUTOMOBILE ENGINEERING

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION

Classification of vehicles, Components of a four wheeler automobile – chassis and body – power unit –power transmission – rear wheel drive, Front wheel drive, 4 wheel drive – types of automobile engines, Engine construction, Turbo charging and super charging – oil filters, Oil pumps – crank case ventilation.

UNIT – II: FUEL SYSTEM

S.I. Engines: Fuel supply systems, Mechanical and electrical fuel pump – air and fuel filters– carburetor – types – air filters – gasoline injection.

C.I. Engines: Requirements of diesel injection systems, Types of injection systems, Fuel pump, Nozzle spray formation, Injection timing, Testing of fuel pumps.

UNIT – III: COOLING SYSTEM

Necessity of cooling system, Cooling Requirements, Air Cooling, Liquid Cooling, Thermo, Water and Forced Circulation System – radiators – types – cooling Fan - water pump, Thermostat, Evaporative cooling – pressure sealed cooling – antifreeze solutions. IGNITION SYSTEM: Function of an ignition system, Battery ignition system, Constructional features of storage battery, Auto transformer, Contact breaker points, Condenser and spark plug – magneto coil ignition system, Electronic ignition system using contact breaker, Electronic ignition using contact triggers – Spark advance and retard mechanism.

UNIT – IV: EMISSIONS FROM AUTOMOBILES

Pollution standards National and International – Pollution Control– Techniques – Multipoint fuel injection for SI Engines - Common rail diesel injection, Emissions from alternative energy sources– Hydrogen, Biomass, Alcohols, LPG, CNG - their merits and demerits.

UNIT – V: ELECTRICAL SYSTEM

Charging circuit, Generator, Current – voltage regulator – starting system, Bendix drive, Mechanism of solenoid switch, Lighting systems, Horn, Wiper, Fuel gauge – oil pressure gauge, Engine temperature indicator.

UNIT – VI : TRANSMISSION SYSTEMS

Clutch - types-coil spring and diaphragm type clutch, Single and multi plate clutch, Centrifugal clutch,Gear box - types-constant mesh, Sliding mesh and synchromesh gear box, Layout of gear box, Gear selector and shifting mechanism, Overdrive, Automatic transmission, Propeller shaft, Universal joint, Slip joint, Differential and rear axle arrangement, Hydraulic coupling .

UNIT – VII: STEERING SYSTEM

Types of steering systems, Ackermann principle, Davis steering gear, Steering gear boxes, Steering linkages, Power steering, Wheel geometry - caster, Camber toe-in, toe out etc., Wheel Alignment and balancing.

UNIT – VIII: SUSPENSION SYSTEM

Need of suspension system, Objects of suspension systems – rigid axle suspension system, Torsion bar, Shock absorber, Independent suspension system.

BRAKE ACTUATING SYSTEM: Classification of brakes, Mechanical brake system, Hydraulic brake system, Pneumatic and vacuum brake systems.

TEXT BOOKS:

1. Kirpal Singh, *Automotive Mechanics*,Vol.1&Vol.2.
2. William Crouse, *Automobile Engineering*, Tata McGraw-Hill.
3. Srinivasan, *Automotive Engines*, Tata McGraw-Hill Education, New Delhi.

REFERENCE BOOKS:

1. R.K.Rajput, *Automobile Engineering*,Laxmi Publications.
2. K.K. Ramalingam, *Automobile Engineering*, Scitech Publications.
3. Newton, *Steeds & Garret, Automotive Engines*, McGraw Hill.
4. Thipse, *Alternate Fuels*, Jaico Publications House.

III B.Tech. II Semester

10BT60311 : HEAT TRANSFER AND DYNAMICS LAB

L	T	P	C
-	-	3	2

Any SIX experiments from each part are to be conducted

PART-A: HEAT TRANSFER LAB

1. Thermal conductivity of metal rod
2. Overall heat transfer co-efficient through Composite Slab Apparatus
3. Thermal conductivity of insulating powder material through concentric sphere apparatus
4. Thermal conductivity of insulating material through lagged pipe apparatus
5. Experiment on transient heat conduction
6. Heat transfer coefficient in natural convection
7. Heat transfer coefficient in forced convection
8. Experiment on Critical Heat flux apparatus.
9. Heat transfer in drop and film wise condensation.
10. Study of heat pipe and its demonstration
11. Study of two phase heat flow
12. Emissivity of a gray body through Emissivity apparatus.
13. Experiment on Stefan Boltzmann Apparatus.
14. Heat transfer in pin-fin
15. Experiment on Parallel and counter flow heat exchanger.

NOTE: Thermal Engineering data books are permitted in the examinations.

PART-B: DYNAMICS LAB

1. Test on Gyroscopic Unit.
2. Test on Universal Governor.
3. Test on Static and Dynamic balancing apparatus.
4. Test on Balancing of Reciprocating Masses.
5. Test on Critical Speed Analyzer.
6. Test on Vibration Test Rig.
7. Test on Cam Apparatus.
8. Shaft alignment testing.
9. Whirling of Shaft Apparatus
10. Determination of pressure distribution in journal bearing.
11. Determination of moment of inertia of connecting rod

NOTE: Internal and End examinations evaluation will be done separately and the average will be recorded.

III B.Tech. II Semester

10BT60312: CAD/CAM LAB

L	T	P	C
-	-	3	2

1. Exercises(2D & 3D) using design packages (any three experiments from each section to be conducted)
   (a) Drafting: Development of part drawings for various components in the form of orthographic and isometric, Representation of dimensioning and tolerances scanning and plotting.
   (b) Part Modeling: Generation of various 3D models through protrusion, revolve, shell sweep, Creation of various features, Study of parent child relation, Feature based and Boolean based modeling surface and assembly modeling, Study of various standard translators, Design of simple components.

2. Exercises using analysis software
   a. Determination of deflection and stresses in 2D and 3D trusses and beams.
   b. Determination of deflection component and principal and Von-Mises stresses in plane stress, plane strain and axisymmetric components.
   c. Determination of stresses in 3D and shell structures (at least one example in each case)
   d. Steady state heat transfer Analysis of plane and axisymmetric components.

3. Exercises on CNC machines(any four experiments to be conducted)
   a. Development of process sheets for various components based on tooling Machines.
   b. Study of various commands (Geometry, Post, Pre-processor, Auxiliary)to control the NC Machines.
   c. Machining of simple components on CNC lathe
   d. Machining of simple components on CNC Milling machines.
   e. Machining of simple components on CNC machines by transferring NC Code from a CAM package through RS 232.
4. Experimentation and simulation of a robot.

Any Six Software Packages from the following:

Use of AutoCAD, Micro Station, CATIA, Pro-E, I-DEAS, ANSYS, NISA, CAEFEM, Gibbs CAM, MasterCAM etc, Hypermesh.

III B.Tech. II Semester

10BT4HS02 : ADVANCED ENGLISH COMMUNICATION SKILLS (AUDIT COURSE)

L	T	P	C
-	3	-	-

UNIT – I: VOCABULARY BUILDING

Synonyms and antonyms - word roots - one-word substitutes - prefixes and suffixes - study of word origin - analogy, idioms and phrases.

FUNCTIONAL ENGLISH: Starting conversation - responding appropriately and relevantly - using the right body language - role play in different situations.

UNIT – II: READING COMPREHENSION

Reading for facts - guessing meanings from context - scanning, skimming, inferring meaning and critical reading.

UNIT – III: ACADEMIC ESSAY WRITING

Accuracy, brevity, clarity, brainstorm - list your ideas - sub-headings - revising content and organization.

UNIT – IV: TECHNICAL REPORT WRITING

Types of formats and styles - subject-matter - subject-organization - clarity, coherence and style - planning - data-collection - tools - analysis.

UNIT – V: CAREER SKILLS

Career direction - exploring your talents - personality inventories - write a “Who I Am” statement - thinking further - perform career research - how do I get hired - creating job satisfaction - identify your satisfaction triggers - positive attitude - maintain a balanced lifestyle - analyze your job in terms of your interests - set goals to bring your interests and responsibilities in line - personal SWOT analysis - making the most of your talents and opportunities - shaping your job to fit you better - future proof your career - managing your emotions at work - get the recognition you deserve.

UNIT – VI: RESUME WRITING

Structure and presentation - planning - defining the career objective - projecting one’s strengths and skill-sets - summary - formats and styles - cover letter.

UNIT – VII: GROUP DISCUSSION

Dynamics of group discussion - intervention- summarizing - modulation of voice - fluency and coherence - participation, Relevance, Assertiveness, Eye contact and body language.

UNIT – VIII: INTERVIEW SKILLS

Concept and process - pre-interview planning- opening strategies- Answering strategies - interview through tele and video-conferencing.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, *Effective Technical Communication Skills*, Tata McGraw Hill, New Delhi, (2005) .
2. Meenakshi Raman and Sangetha Sharma, *Technical Communication Principles and Practice*, Oxford University Press, New Delhi. (2010)
3. Santha Kumar R, *Secrets of Success in Interviews*, Crucial Books, Secunderabad. (2007)
4. M. Ashraf Rizvi, *Resumes and Interviews - The Art of Wining*. Tata McGraw Hill, New Delhi, (2008)
5. Gopala Swamy Ramesh and Mahadevan Ramesh, *The Ace of Soft Skills: Attitude, Communication and Etiquette for Success*, Pearson Education, New Delhi, (2009)

SUGGESTED SOFTWARES:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.
7. E-correspondence, Young India Films.

IV B.Tech. I Semester

10BT70301 : MANUFACTURING SYSTEMS DESIGN

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO MANUFACTURING SYSTEMS AND MODELS

Types and principles of manufacturing systems, Types of manufacturing models-physical models-mathematical models, Model uses, Model building, Input – output model.

UNIT – II: INTRODUCTION TO AUTOMATED MANUFACTURING SYSTEMS

History of manufacturing, The product cycle, Manufacturing automation, Modeling of automated manufacturing systems, Role of performance modeling, Performance measures, Performance modeling tools-simulation models- analytical models.

UNIT – III: PERFORMANCE MEASURES OF MANUFACTURING SYSTEMS

Performance Measures - Manufacturing Lead Time, Work-In-Process (WIP), Machine Utilization, Throughput, Capacity, Flexibility, Performability and Quality.

UNIT – IV: HIGH VOLUME PRODUCTION SYSTEMS

Automated flow lines, Methods of work part transport, Transfer mechanism, Transfer lines-terminology and analysis, Assembly systems - process, Line balancing, Methods of line balancing, Manual assembly lines, Automated assembly systems - types - design.

UNIT – V: LAYOUT DESIGN

Group technology - introduction - part classification and coding - assigning machines to groups-Rank order clustering algorithm, Facility layout – sequential layout planning, Facilities planning & design approach to manufacturing industries.

UNIT – VI: FLEXIBLE MANUFACTURING SYSTEMS (FMS)

FMS - definition - FMS workstations, Material handling and storage systems, Computer control systems, Planning the FMS, Analysis methods for FMS, Applications and benefits.

UNIT – VII: OPTIMIZATION TECHNIQUES

Introduction, Importance, Classification of optimization techniques-mathematical programming techniques- stochastic techniques-statistical methods, Classification of optimization problems based on existence of constraints, Nature of design variables-physical structure of the problem-nature of equations involved- permissible values of the design variables.

UNIT – VIII: SIMULATION IN SYSTEM DESIGN

Empirical simulation models-event models, process models, Simulation system, Simulation of manufacturing system.

TEXT BOOKS:

1. Ronald. G. Askin, *Modeling and Analysis of Manufacturing Systems*, John Wiley and Sons, Inc.
2. N. Viswanadham, Y. Narahari, *Performance Modeling of Automated Manufacturing Systems*, PHI.
3. Mikell.P.Groover, Automation , *Production Systems & Computer Integrated Manufacturing*, PHI
4. S.S.Rao,*Engineering Optimization*, New Age International Publications.

REFERENCE BOOKS:

1. P. Brandimarte, *A Villa, Modeling Manufacturing Systems*, Springer Verlag, Berlin.
2. Richard Crowson, *Factory Operations: Planning and Instructional Methods- Ed2*, CRC Press, Second Edition.
3. Phillip. F. Ostwald, Jairo Munoz, *Manufacturing Processes and Systems*, John Wiley and Sons Inc., 9th Edition.

IV B.Tech. I Semester

10BT70302 : INDUSTRIAL AUTOMATION AND ROBOTICS

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO AUTOMATION
Automation –need-types, Basic elements of an automated system, levels of automation-hardware components for automation and process control, Mechanical feeders, Hoppers, Orienters, High speed automatic insertion devices.

UNIT – II: AUTOMATED FLOW LINES
Part transfer methods and mechanisms, Types of flow lines, Flow line with/without buffer storage, Qualitative analysis.

UNIT – III: ASSEMBLY LINE BALANCING
Assembly process and systems assembly line, Line balancing methods, Ways of improving line balance, Flexible assembly lines.

UNIT – IV: INTRODUCTION TO INDUSTRIAL ROBOTS
Robots-classification - robot configurations, Functional line diagram, Degrees of freedom, Components, Common types of arms - joints, Grippers.

UNIT – V: MANIPULATOR KINEMATICS
Homogeneous transformations as applicable to rotation and translation - (D-H) notation, Forward and inverse kinematics.
Manipulator dynamics: differential transformation, Jacobians, Lagrange – Euler and Newton – Euler formations.

UNIT – VI: TRAJECTORY PLANNING
Trajectory planning and avoidance of obstacles, Path planning, Skew motion, Joint integrated motion – straight line motion.
Robot programming-types – features of languages and software packages.

UNIT – VII: ROBOT ACTUATORS AND FEED BACK COMPONENTS
Actuators- pneumatic-hydraulic actuators, Electric & stepper motors, comparison, Position sensors – potentiometers- resolvers-encoders– velocity sensors-tactile sensors-proximity sensors.

UNIT – VIII: ROBOT APPLICATION IN MANUFACTURING
Material transfer - material handling, loading and unloading-processing - spot and continuous arc welding & spray painting - assembly and inspection.

TEXT BOOKS:

1. Mikell P. Groover, *Automation, Production Systems and CIM*, Prentice-Hall of India Pvt. Ltd.
2. M.P. Groover, *Industrial Robotics*, TMH.

REFERENCE BOOKS:

1. K. S. Fu., R. C. Gonzalez, C. S. G. Lee, *Robotics: Control Sensing, Vision and Intelligence International Edition*, McGraw Hill Book Co.
2. P. Coiffet and M.Chaironze, *An Introduction to Robot Technology*, Kogam Page Ltd. London.
3. Richard. D.Klafter, *Robotics Engineering*, Prentice Hall
4. Ashitave Ghosal, Robotics, *Fundamental Concepts and analysis*, Oxford Press, 2006
5. Mittal R.K & Nagrath IJ, *Robotics and Control*, TMH.
6. John. J. Craig, *Introduction to Robotics*, Pearson.

IV B.Tech. I Semester

10BT70303 : FINITE ELEMENT METHODS

L	T	P	C
4	1	-	4

UNIT – I:
Introduction to Finite element method for solving field problems, Stress and equilibrium, Strain - Displacement relations, Stress - strain relations.

UNIT – II:
One Dimensional problems: Finite element modeling coordinates and shape functions. Potential Energy approach: Assembly of Global stiffness matrix and load vector. Finite element equations, Treatment of boundary conditions, Quadratic shape functions.
Development of Truss Equations: Derivation of stiffness matrix for a beam element in local coordinates, Selecting approximation functions for displacement, Global stiffness matrix, Computation of stress for a bar in x-y Plane, Solution of a plane truss, Potential energy approach to derive bar element equations, Comparison of finite element solution to exact solution for bar, Galerkin's residual method and its use to derive the one-dimensional bar element equation, Other residual methods and their applications to a one-dimensional bar problem.

UNIT – III:
Development of Beam Equations: Beam stiffness, Example of assemblage of beam stiffness matrices, distributed loading, Beam element with nodal hinge, Potential energy approach to derive beam element equations, Galerkin's methods for deriving beam element equations.

UNIT – IV:
Frames, Plane stress and strain equations: Two-dimensional arbitrarily oriented beam element rigid plane frame examples, Grid equations, Basic concepts of plane stress and plane strain, Derivation of the constant strain triangular element stiffness matrix and equations, Treatment of body and surface forces, Explicit expression for the constant strain triangle stiffness matrix, Finite element solution of a plane stress problem.

UNIT – V:
Development of a linear strain and axisymmetric elements: Introduction, Derivation of the linear strain triangular element stiffness matrix and equations, Example LST stiffness determination, Comparison of elements, Derivation of the stiffness matrix, Solution of an axisymmetric pressure vessel, Isoparametric formulation: Isoparametric formulation of the bar element stiffness matrix,

Rectangular plane stress element, Isoparametric formulation of the plane element stiffness matrix, Evaluation of the stiffness matrix and stress matrix by Gaussian quadrature.

UNIT – VI:

Heat and Mass Transfer analysis: Derivation of the basic differential equation, Heat transfer with convection, Typical units of thermal conductivities-K and heat transfer coefficients-h, One-dimensional finite element formulation using a variational method, Two-dimensional finite element formulation, Line or point sources, One-dimensional heat transfer with mass transport, Finite element formulation of heat transfer with mass transport by Galerkin's method, Flow chart and examples of a heat transfer program.

UNIT – VII:

Fluid flow and thermal stress analysis: Derivation of the basic differential equations, One-dimensional finite element formulation, Two-dimensional finite element formulation, Flow chart and examples of a fluid flow program.

UNIT – VIII:

Structural dynamic and time dependent heat transfer: Dynamics of a spring mass system, Direct derivation of the bar element equations, Numerical integration in time, Natural frequencies of a one-dimensional bar, Time dependent one dimensional bar analysis, Beam element mass matrices and natural frequencies, Truss, plane frame, Plane stress/strain, Time-dependent heat transfer.

Dynamic analysis: Formulation of FEM Model, element matrices, Evaluation of eigen values and eigen vectors for a stepped bar and a beam.

TEXT BOOKS

1. Chandraputla, A. and Belegundu, *Introduction to Finite Elements in Engineering*, PHI.
2. S.S. Rao, *Finite Element Methods in Engineering*, Pergamon.
3. Daryl. L. Logan, *A First Course In Finite Element Method*, Cengage Learning.

REFERENCES

1. David. V. Hutton, *Fundamentals Of Finite Element Analysis*, TMH
2. J. N. Reddy, *An Introduction to Finite Element Method*, TMH
3. O.C. Zienkiewicz, *Finite Element Method, its Basics And Fundamentals*, Elsevier
4. Kenneth H. Huebner, Donald. L. Dewhirst, Douglas E. Smith and Ted G. Byrom, *The Finite Element Method for Engineers*, John Wiley & Sons.
5. G.Lakshminarasaiah, *Finite Element Analysis*, B.S.Publishers, 2008.

IV B.Tech. I Semester

10BT70304 : PRODUCTION AND OPERATIONS MANAGEMENT

L	T	P	C
4	1	-	4

UNIT– I: OPERATIONS MANAGEMENT CONCEPTS
Introduction, Historical development, Information and Non-manufacturing systems, Operations management, Factors affecting productivity, International dimensions of productivity, The environment of operations, Production systems decisions.

UNIT– II: FORECASTING DEMAND
Forecasting objectives and uses, Forecasting variables, Opinion and judgmental methods, Time series methods, Exponential smoothing, Regression and correlation methods, Application and control of forecasts.

UNIT–III: AGGREGATE PRODUCTION PLANNING
Planning hierarchies in operations, Need for aggregate production planning, Alternatives for managing supply and demand, Basic strategies for aggregate production planning – level, Chase and mixed, Aggregate production planning methods, Master production scheduling.

UNIT-IV: MATERIAL AND CAPACITY REQUIREMENTS PLANNING
Overview: MRP and CRP, MRP-underlying concepts, Bill of Material, System parameters, MRP logic, System refinements, Capacity management, CRP activities. Manufacturing Resource Planning, Enterprise Resource Planning.

UNIT– V: SINGLE MACHINE SCHEDULING
Concept, Measures of performance, SPT rule, Weighted SPT rule, EDD rule, Minimizing the number of tardy jobs.
FLOW -SHOP SCHEDULING: Introduction, Johnson's rule for 'n' jobs on 2 and 3 machines, CDS heuristic.
JOB-SHOP SHEDULING: Types of schedules, Heuristic procedure, scheduling 2 jobs on 'm' machines.

UNIT – VI: INVENTORY PLANNING AND CONTROL
Reasons for carrying inventory, Types of inventory, Handling uncertainty in demand, Inventory control systems – Continuous review and periodic review systems, Selective control of inventory – ABC classification, Other classification schemes, Inventory planning for single period demand.

UNIT – VII: SUPPLY CHAIN MANAGEMENT
Supply chain components, Supply chain structures, Bullwhip effect, Measures of supply chain performance, Role of information technology in Supply Chain Management.

UNIT – VIII: LEAN SYSTEMS
Characteristics of Just-in-Time operations, Pull method of materials flow, Consistently high quality, Small lot sizes, Uniform workstation loads, Standardized components and work methods, Close supplier ties, Flexible workforce, Line flows, Automated production, Preventive maintenance, continuous improvement, Kaizen.

TEXT BOOKS:

1. B.Mahadevan, *Operations Management – Theory and Practice*, Pearson.
2. Everett E. Adam, Ronald J. Ebert, *Production and Operations Management*, PHI.
3. Lee J Krajewski, Larry P Ritzman and M K Malhotra, *Operations management – Processes and Value Chains*, 8th edition, PHI.

REFERENCE BOOKS:

1. Chary, S.N, *Production and Operations Management*, Tata- McGraw Hill.
2. Monks J.G., *Operations Management*, Schaums outline series, McGraw-Hill International Edition.
3. Pannerselvam. R, *Production and Operations Management*, PHI

IV B.Tech. I Semester

10BT70305 : REFRIGERATION AND AIR CONDITIONING
(ELECTIVE – I)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO REFRIGERATION
Necessity and applications, Unit of refrigeration and COP., Different refrigeration methods – Ice Refrigeration, Refrigeration by expansion of air, Air Refrigeration - Bell-coleman & Brayton cycles, Open and dense air systems –problems, Refrigeration needs of air crafts.

UNIT – II: VAPOUR COMPRESSION REFRIGERATION(VCR)
Basic cycle, Working principle and essential components of the plant, COP, Representation of cycle on T-S and P-h charts, Expander Vs. Throttling, Effect of sub cooling and super heating, Cycle analysis, Actual cycle- influence of various parameters on system performance, Construction and Use of P-h charts, Numerical Problems.

UNIT – III: SYSTEM COMPONENTS OF VCR
Compressors – types – hermetically sealed & Screw compressors
Condensers – types – air cooled & water cooled condensers.
Evaporators – types, Flooded, Shell and Tube, Shell and Coil evaporators
Expansion Devices – types, Capillary tube, Automatic expansion valve, Thermostatic expansion valve.
REFRIGERANTS FOR VCR: desirable properties, Classification of refrigerants used – Nomenclature, Secondary refrigerants and newer refrigerants.

UNIT – IV: VAPOR ABSORPTION REFRIGERATION SYSTEM
Description and working of NH_3, Water system and Li Br –water (Two shell & Four shell) System -calculation of Max. COP, Principle of operation of three Fluid absorption system.

UNIT – V: STEAM JET REFRIGERATION SYSTEM
Working principle and basic Components, Estimation of motive steam required principle and operation of: (i) Thermo-electric refrigerator (ii) Vortex tube or Hilsch tube.

UNIT – VI: INTRODUCTION TO AIR CONDITIONING
Psychrometric properties & processes, Characterization of sensible and latent heat loads, Need for Ventilation, Consideration of infiltrated air, Heat load concepts - RSHF, GSHF, Problems.

UNIT – VII: AIR CONDITIONING EQUIPMENT
Humidifiers, Dehumidifiers, Air filters, Fans,Blowers.
HEAT PUMP: Heat sources, Different heat pump circuits.

UNIT – VIII: COMFORT AIR CONDITIONING
Requirements of human comfort and concept of effective temperature, Comfort chart, Comfort Air conditioning-summer-winter & year round air conditioning, Simple problems.

TEXT BOOKS:

1. Domkundwar Arora Domkundwar, *A Course in Refrigeration and Air conditioning*, Dhanpatrai publication, 8th Edition, 2011.
2. CP Arora, *Refrigeration and Air conditioning*, 8th Edition,TMH

REFERENCE BOOKS:

1. Stoecker, W. F. and Jones, J. W., *Refrigeration and Air Conditioning*, 2nd Edition. McGraw-Hill, New York,
2. Manohar Prasad, *Refrigeration and Air Conditioning*, 2nd Edition, New Age International.
3. Roy.J.Dossat, *Principles of Refrigeration*, 4th Edition, Pearson,.
4. P.L.Ballaney, *Refrigeration and Air Conditioning*, 15th Edition, Khanna Publications.
5. R.C.Arora, *Refrigeration and Air Conditioning*, PHI.
6. P.N.Ananthanarayanan, *Basic Refrigeration and Air-Conditioning*, 3rd Edition, TMH.
7. R.S.Khurmi, J.K.Gupta, *A Text book of Refrigeration & Air conditioning*, S.Chand.

Tables/Codes: Thermal Engineering Data Book containing Refrigerant and Psychrometric property Tables and charts to be supplied in examination.

IV B.Tech. I Semester

10BT70306 : TOOL DESIGN
(ELECTIVE – I)

L	T	P	C
4	1	-	4

UNIT – I: TOOLING MATERIALS AND HEAT TREATMENT
Tooling materials and heat treatment: Properties of materials, Ferrous, Nonferrous, Non metallic, tooling materials, Heat treating, Limits, Tolerances, Error Analysis, and Fits, Gauges and gauge design coated tools, Ceramic tools.

UNIT – II: CUTTING TOOLS
Cutting tool classification- nomenclature of single point cutting tool – difference between orthogonal and oblique cutting – mechanism of metal cutting, Types of chips – chip breakers, Forces acting on tool- Merchant circle diagram.

UNIT – III: DESIGN OF MULTIPOINT CUTTING TOOLS
Design of multipoint cutting tools: Drill geometry, Design of drills, Rake & relief angles of twist drill, Speed, Feed and depth of cut, Machining time, Forces, Milling cutters, Cutting speeds and feed-machining times-design-form cutters, Combination tools, Reamers etc.

UNIT – IV: JIGS AND FIXTURES
Design of jigs and fixtures: Basic principles of location and clamping, Methods of clamping and clamping devices, Jigs - definitions - types, General consideration in the design of jigs, Drills bushing, Methods of construction, Fixtures-vice fixtures - milling - boring and lathe grinding fixtures.

UNIT – V: DESIGN OF SHEET METAL BLANKING AND PIERCING
Design of sheet metal blanking and piercing: Fundamentals of die cutting operating, Power press types, General press information, Material handling equipment, Cutting action in punch and die operation, Die clearance, and types of die construction, Die design fundamentals-blanking and piercing die construction, Pilots, striper and pressure pads presswork material, Strip layout, Short run tooling for piercing.

UNIT – VI: FORMING AND DRAWING
Design of sheet metal bending, Forming and drawing dies: Bending dies, Drawing dies, Forming dies, Drawing operations, Variables that effect metal flow during drawing, Determination of blank size, drawing force, Single and double action draw dies.

UNIT – VII: TOOL WEAR ANF TOOL LIFE

Tool wear – tool life – factors affecting tool life- Taylor's tool life equation- tool wear mechanisms- types of tool wear- heat distribution in metal cutting – measurement of temperature in metal cutting.

UNIT – VIII:

Using plastics as tooling materials: Introduction, Plastics commonly used as tooling material, Application of epoxy plastic tools, Construction methods of plastic tooling, Metal forming operations with urethane dies, Calculating forces for urethane pressure pads, Economics of tooling.

TEXT BOOKS:

1. Donaldson, Lecain and Goold, *Tool Design*, Tata McGraw Hill.
2. A Bhattacharya, *Principles of Metal cutting*, New Central Book Agency, Calcutta.
3. G.R.Nagpal, *Tool Engineering and Design*, Khanna Publishers, 2004.

REFERENCE BOOKS:

1. Surendra Kenav and Umesh Chandra, Satyaprakashan, *Production Engineering Design* (Tool Design), New Delhi.
2. Amitabha Battacharya and Inyong Ham, *Design of Cutting Tools use of Metal Cutting Theory*, ASTME Publication, Michigan USA.
3. V.Arshinov, G.Alekseev, *Metal Cutting Theory and Cutting Tool Design*, MIR Publications.
4. ASTME *Fundamentals of Tool Design*, PHI.
5. P. C. Sharma, *Text Book of Machine Tools and Tool Design*, S. Chand & Co Ltd.

IV B.Tech. I Semester

10BT70307 : MECHANICAL VIBRATIONS
(ELECTIVE – I)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION
Fundamentals of vibrations – importance and scope, Definition and terminology, Classification of vibrations – simple harmonic motion-combination of simple harmonic motion, Mathematical modeling – Fourier analysis.

UNIT – II: SINGLE DEGREE-OF-FREEDOM SYSTEMS (FREE VIBRATION) – I
Undamped free vibrations – classical method, Energy method, Phase plane methods, Equivalent systems – springs in parallel and series.

UNIT – III: SINGLE DEGREE-OF-FREEDOM SYSTEMS (FREE VIBRATION) – II
Damped free vibration - viscous damping- under damping-critical damping, Coulomb damping, Equivalent damping coefficient.

UNIT – IV: SINGLE DEGREE-OF- FREEDOM SYSTEMS WITH FORCED VIBRATIONS
Constant harmonic excitation - steady state forced vibration, Impressed harmonic force, Impressed force due to unbalance, Motion excitation - amplitude – absolute, relative, Rotating with reciprocating unbalance, Transmissibility and isolation – Force, Motion transmissibility, Damping – coulomb damping, Viscous damping.

UNIT – V: TWO DEGREE FREEDOM SYSTEMS
Natural frequencies and modes of vibration by classical method of spring-mass system, Forced vibration, Dynamic vibration absorber, Torsional system.

UNIT – VI: MULTI DEGREE FREEDOM SYSTEMS
Influence co-efficient method, Damped mass and distributed mass systems, Natural frequencies and mode shapes - Stodola method, Holzer's method, Dunkerley's method, Rayleigh's method, Mechanical impedance method, Newton's iteration method, Orthogonality of mode shapes.

UNIT – VII: VIBRATION IN CONTINUOUS SYSTEMS
Longitudinal vibrations of bars, Torsional vibrations of circular rods or shafts, Lateral vibrations of beams and shafts.

UNIT – VIII: VIBRATION CONTROL

Reduction of vibration at the source, Balancing of rotating machines, Whirling of rotating shafts, Balancing of reciprocating engines, Measuring instruments – vibrometers, Velocity pick-ups, Accelerometers.

TEXT BOOKS:

1. G.K.Groover, S.P. Nigam, *Mechanical Vibrations*, 8th Edition-Nemchand & Bros.
2. Srikant Bhave, *Mechanical Vibrations Theory and Practice*, 10th Edition-Pearson Publication
3. S.S.Rao, *Mechanical Vibrations*, Pearson Publication.

REFERENCE BOOKS:

1. W.T. Thompson, *Theory of Vibration with Applications*, Prentice hall.
2. Sadhu Singh, *Mechanical vibrations and Noise control*, 13th Edition, Dhanpat Rai & Sons
3. V.P.Singh, *Mechanical Vibrations*, Dhanpat Rai & Co.
4. Timeoshenko and Young, *Vibration Problems in Engineering*, Wolfenden Press.

IV B.Tech. I Semester

10BT70308 : ENGINEERING OPTIMIZATION
(ELECTIVE – I)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO OPTIMIZATION
Introduction, Engineering applications of optimization, Statement of an optimization problem, Design vector, Design constraints, Constraint surface, Objective function, Classification of optimization problems.

UNIT – II: CLASSICAL OPTIMIZATION TECHNIQUES
Single variable optimization, Multi variable optimization without constraints, Necessary and sufficient conditions for minimum/ maximum, Multivariable optimization with equality constraints, Solution by Lagrange multipliers method, Multi variable optimization with inequality constraints, Kuhn-Tucker conditions.

UNIT – III: UNCONSTRAINED NON-LINEAR PROGRAMMING
One dimensional minimization methods - classification - uni model function – unrestricted search - exhaustive search – Fibonacci method - Golden section method - quadratic interpolation method.

UNIT – IV: UNCONSTRAINED OPTIMIZATION TECHNIQUES
Classification of unconstrained minimization methods – univariate method, Powell's method, Hooks and Jeeves pattern search methods - Descent methods – Steepest descent and Newton methods.

UNIT – V: CONSTRAINED NON – LINEAR PROGRAMMING
Characteristics of a constrained problem, Classification, Basic approach of penalty function method, Basic approach of interior and exterior penalty function methods, Introduction to convex programming problem.

UNIT – VI: DYNAMIC PROGRAMMING
Multistage decision process, Concept of sub optimization and the principle of optimality, LPP by dynamic programming approach, Applications-reliability problem, Shortest path problem, Capital budgeting problem and inventory.

UNIT – VII: INTEGER PROGRAMMING
Introduction, Graphical representation, Gomory's cutting plane method and the Branch and Bound technique.

UNIT – VIII: NON- TRADITIONAL OPTIMIZATION ALGORITHMS
Genetic algorithms- working principle, Difference and similarities between Genetic algorithms and traditional methods, Genetic algorithms for constrained optimization, Neural networks and Simulated annealing approach-(introduction only).

TEXT BOOKS:

1. Singiresu S Rao, *Engineering Optimization: Theory and Practice*, New Age International.
2. A.Ravindran, K.M.Ragsdell, G.V.Reklaitis, *Engineering Optimization: Methods and Applications*, Wiley India Pvt. Ltd.

REFERENCE BOOKS:

1. Mohan C and Kusum Deep, *Optimization Techniques*, New Age Science, UK, 2009.
2. Stephen G Nash and Sofer A, *Linear and Nonlinear Programming*, McGraw Hill, New York.
3. Johnson Ray C, *Optimum Design for Mechanical elements*, John Wiley & Sons, New York.
4. Goldberg D E, Genetic Algorithms Search, *Optimization and Machine*, Barnen Addison Wesley, USA.

IV B.Tech. I Semester

10BT70309 : POWER PLANT ENGINEERING
(ELECTIVE – II)

L	T	P	C
4	1	-	4

UNIT – I:
Introduction to the sources of energy – resources and development of power in India.
STEAM POWER PLANT: Plant layout, Working of different circuits, Fuel and handling equipments, Types of coals, Coal handling, Choice of handling equipment, Coal storage, Ash handling systems.

UNIT – II: STEAM POWER PLANT
Combustion process, Properties of coal – overfeed and underfeed fuel beds, Traveling grate stokers, Spreader stokers, Retort stokers, Pulverized fuel burning system and its components, Combustion needs and draught system, Cyclone furnace, Design and construction, Dust collectors, cooling towers and heat rejection, Corrosion and feed water treatment.

UNIT – III: INTERNAL COMBUSTION ENGINE PLANT
Diesel power plant: Introduction – IC engines- types- construction– plant layout with auxiliaries – fuel supply system, Air starting equipment, Lubrication and cooling system – super charging.

UNIT – IV: GAS TURBINE PLANT
Introduction – classification - construction – layout with auxiliaries– principles of working of closed and open cycle gas turbines, Combined cycle power plants and comparison.

UNIT – V: HYDRO ELECTRIC POWER PLANT
Water power – hydrological cycle / Flow measurement – drainage area characteristics – hydrographs – storage and Pondage – classification of dams and spill ways.
HYDRO PROJECTS AND PLANT: Classification – typical layouts – plant auxiliaries – plant operation - pumped storage plants.

UNIT – VI: POWER FROM NON-CONVENTIONAL SOURCES
Utilization of solar collectors- principle of working, Wind energy – types – HAWT, VAWT - tidal energy.
DIRECT ENERGY CONVERSION: Solar energy, Fuel cells, Thermo electric and Thermo ionic, MHD generation.

UNIT – VII: NUCLEAR POWER STATION

Nuclear fuel – breeding and fertile materials – nuclear reactor – reactor operation.

TYPES OF REACTORS: Pressurized water reactor, Boiling water reactor, Sodium-graphite reactor, Fast breeder reactor, Homogeneous reactor, Gas cooled reactor, Radiation hazards and shielding – radioactive waste disposal.

UNIT – VIII: POWER PLANT ECONOMICS AND ENVIRONMENTAL CONSIDERATIONS

Capital cost, Investment of fixed charges, Operating costs, General arrangement of power distribution, Load curves, Load duration curve, Definitions of Connected load, Maximum demand, Demand factor, Average load, Load factor, Diversity factor – related exercises, Effluents from power plants and Impact on environment – pollutants and pollution standards – methods of pollution control.

TEXT BOOKS:

1. Arora and S. Domkundwar, *A Course in Power Plant Engineering*, Dhanpat Rai and Co (P) Ltd.
2. P.C.Sharma, *Power Plant Engineering*, S.K.Kataria Publishing House.

REFERENCE BOOKS:

1. P.K.Nag, *Power Plant Engineering* 2nd edition, TMH.
2. Ramalingam, *Power plant Engineering*, Scitech Publishers.
3. Rajput.R.K, *A Text Book of Power Plant Engineering*, Laxmi Publications.
4. C. Elanchezian and others, *Power Plant Engineering*, I.K. International, 2010.

IV B.Tech. I Semester

10BT70310 : COMPOSITE MATERIALS
(ELECTIVE – II)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO COMPOSITE MATERIALS
Introduction, Classification: Polymer matrix composites, Metal matrix composites, Ceramic matrix Composites, Carbon–Carbon composites, Fiber, Reinforced composites and nature-made composites and applications.

UNIT – II: REINFORCEMENTS
Fibres-Glass, Silica, Kevlar, Carbon, Boron, Silicon carbide, and boron carbide, Fibres, Particulate composites, Polymer composites, Thermoplastics, Thermosets, Metal matrix and ceramic composites.

UNIT – III: MANUFACTURING METHODS
Autoclave, Tape production, Moulding methods, Filament winding, Man layup, Pultrusion, RTM.

UNIT – IV: MACRO MECHANICAL ANALYSIS OF A LAMINA
Introduction, Definitions: Stress, Strain, Elastic Moduli, Strain energy, Hooke's law for different Types of materials, Hooke's law for a 2-D, Unidirectional Lamina, Plane stress assumption, Reduction of Hooke's law in three dimensions to two dimensions, Relationship of compliance and stiffness matrix to Engineering elastic constants of a lamina.

UNIT – V:HOOKE'S LAW AND HYGROTHERMAL STRESS–STRAIN RELATIONSHIPS
Hooke's Law for a two-dimensional angle lamina, Engineering constants of an angle lamina, Invariant form of stiffness and compliance matrices for an angle lamina strength failure, Envelopes, Maximum strain failure theory, Tsai–Hill failure theory, Tsai–Wu failure theory, Comparison of experimental results with failure theories, Hygrothermal stresses and strains in a Lamina: Hygrothermal stress–strain relationships for a unidirectional lamina, Hygrothermal stress–strain relationships for an angle lamina

UNIT – VI: MICROMECHANICAL ANALYSIS OF A LAMINA
Introduction, Volume and mass fractions, Density and void content, Evaluation of the four elastic moduli, Strength of materials approach, Semi empirical models, Elasticity approach, elastic moduli of lamina with transversely isotropic fibers, Ultimate strengths of a unidirectional lamina, Coefficients of thermal expansion, Coefficients of moisture expansion.

UNIT – VII: MACRO MECHANICAL ANALYSIS OF LAMINATES
Introduction, Laminate Code, Stress–strain relations for a laminate, In-Plane and Flexural modulus of a laminate, Hygrothermal effects in a laminate, Warpage of laminates

UNIT – VIII: FAILURE ANALYSIS AND DESIGN OF LAMINATES
Introduction, Special cases of laminates, Failure criterion for a laminate, Design of a laminated composite, Other mechanical design issues.

TEXT BOOKS:

1. Isaac and M Daniel, *Engineering Mechanics of Composite Materials*, Oxford University Press.
2. R. M. Jones, Mechanics of Composite Materials, Mc Graw Hill Company, New York.

REFERENCE BOOKS:

1. B. D. Agarwal and L.J. Broutman, *Analysis and Performance of Fibre Composites*, Wiley- Interscience, New York.
2. Autar K. Kaw, *Mechanics of Composite Materials*, *(Mechanical Engineering)*, 2nd edition, CRC Publications.
3. Kishan K. Chawla, *Composite Materials Science and Engineering*, Springer.
4. L.R. Calcote, Van Nostrand Rainfold, *Analysis of Laminated Composite Structures*, New York.
5. Madhujit Mukhpadhyay, *Mechanics of Composite Materials and structures*, New York.
6. Ever J. Barbero, *Finite Element Analysis of Composite Materials*, CRC Press.

IV B.Tech. I Semester

10BT70311 : MECHATRONICS
(ELECTIVE – II)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION
Definition – traditional and mechatronics design – control systems – examples of mechatronic systems.

UNIT – II: SIGNAL CONDITIONING
Introduction – hardware - digital I/O, Analog input – ADC, Resolution, Speed channels filtering noise using passive components – resistors, capacitors - amplifying signals using OP amps – software - digital signal processing, Low pass, High pass, Notch filtering

UNIT – III: PRECISION MECHANICAL SYSTEMS
Pneumatic actuation systems - electro- pneumatic actuation systems- hydraulic actuation systems - electro-hydraulic actuation systems - timing belts – ball screw and nut - linear motion guides - linear bearings - harmonic transmission - bearings- motor / drive selection.

UNIT – IV: ELECTRONIC INTERFACE SUBSYSTEMS
TTL, CMOS interfacing - sensor interfacing – actuator interfacing – solenoids, Motors isolation schemes- opto coupling, Buffer IC's - protection schemes – circuit breakers, over current sensing, Resettable fuses , Thermal dissipation - power supply - bipolar transistors/ mosfets.

UNIT – V: ELECTROMECHANICAL DRIVES
Relays and solenoids - stepper motors - DC brushed motors – DC brushless motors - DC servo motors - 4-quadrant servo drives, PWM's - Pulse width modulation – Variable frequency drives, Vector drives - Drive system load calculation.

UNIT – VI: MICROCONTROLLERS OVERVIEW
8051 Microcontroller, Micro processor structure, Digital Interfacing-Analog Interfacing, Digital to analog convertors, Analog to Digital convertors – applications, Programming – assembly, C (LED Blinking, Voltage measurement using ADC).

UNIT – VII: PROGRAMMABLE LOGIC CONTROLLERS:
Basic structure - programming: Ladder diagram - timers, Internal relays and counters - shift registers - master and jump controls - data handling - analog input / output - PLC Selection - applications.

UNIT – VIII: PROGRAMMABLE MOTION CONTROLLERS

Introduction - system transfer function – Laplace transform and its application in analysing differential equation of a control system - feedback devices :position , Velocity Sensors - optical incremental encoders - proximity sensors : Inductive , Capacitive ,Infrared - continuous and discrete processes - control System performance & tuning - Digital controllers- P , PI , PID control - control modes – position , Velocity and torque - Velocity profiles – Trapezoidal-S-curve - electronic gearing - controlled velocity profile - multi axis interpolation , PTP, Linear, Circular - core functionalities – home, Record position , Go to position - applications : SPM, Robotics.

TEXT BOOKS:

1. W Bolton, *Mechatronics Electronics Control Systems in Mechanical and Electrical Engineering*, 3rd edition, Pearson, 2005.
2. N. Shanmugam, *Mechatronics*, Anuradha Agencies Publishers.

REFERENCE BOOKS:

1. Newton C Braga, *Mechatronics Source Book*, Thomson.
2. Devdas Shetty, Richard, *Mechatronics System Design*, Thomson.
3. A. Smaili & F. Mrad, *Mechatronics*, Oxford, 2008.
4. Ramachandran, *Mechatronics: Integrated Mechanical Electronic Systems*, Wiley India.
5. M.D.Singh, J.G.Joshi, *Mechatronics*, PHI.

IV B.Tech. I Semester

10BT70312 : ENTREPRENEURSHIP
(ELECTIVE – II)

L	T	P	C
4	1	-	4

UNIT – I

Introduction to Entrepreneurship- definition of Entrepreneur, Entrepreneurial Traits, Entrepreneur vs Manager, Entrepreneur vs Intrapreneur, The Entrepreneurial decision process, Role of Entrepreneurship in economic development, Ethics and social responsibility of Entrepreneurs, Opportunities for Entrepreneurs in India and abroad, Woman as Entrepreneur.

UNIT – II

Creating and starting the venture, Sources of new ideas, Methods of generating ideas, Creating problem solving, Product selection strategies, Product planning and development process.

UNIT – III

The business plan nature and scope of business plan, Writing business plan, Evaluating business plans, Using and implementing business plans, Marketing plan, Financial plan and the organizational plan, Launching formalities.

UNIT – IV

Financing and managing the new venture, Sources of capital, Venture capital, Angel investment, Record keeping, Recruitment, Motivating and leading teams and financial controls, Marketing and sales controls, E-commerce and Entrepreneurship, Internet advertising.

UNIT – V

New venture expansion strategies and issues, Features and evaluation of joint ventures, Acquisitions, Merzers, Franchising, Public issues, Rights issues, Bonus issues and stock splits.

UNIT – VI

Selection of location and layout, Issues related to selection of layout.

UNIT – VII

Production and marketing management thrust of production management, Selection of production techniques, Plant utilization and maintenance, Designing the work place, Inventory control, Material handling and quality control, Marketing functions, Market segmentation, Market research and channels of distribution, Sales promotion and product pricing.

UNIT – VIII:
Role of government institutions such as MHRD, MSME, SFC, DIC etc., in promoting entrepreneurship-globalization-scope of Entrepreneurship, Concept of supply chain and value chain.

TEXT BOOKS:

1. Robert Hisrich, & Michael Peters, *Entrepreneurship*, Tata McGraw Hill.
2. Dollinger, *Entrepreneurship*, Pearson.

REFERENCE BOOKS:

1. Vasant Desai, *Dynamics of Entrepreneurial Development and Management*, Himalaya Publications. House, 2004.
2. Harvard Business Review on Entrepreneurship, HBR Paper Back.
3. Thomas W. Zimmerer & Norman M. Scarborough, *Essential of Entrepreneurship and small business managemen*t, PHI.
4. ND Kapoor, *Industrial Law*, Sultan Chand & Sons.

IV B.Tech. I Semester

10BT70313 : METROLOGY AND MEASUREMENTS LAB

L	T	P	C
-	-	3	2

Any SIX experiments from each part are to be conducted

PART-A: METROLOGY LAB

1. Measurement of lengths, Heights, Diameters, Internal bores by Vernier, Micrometer, Internal micrometer and dial bore indicators.
2. (a) Measurement of angle and taper by using Bevel protractor, sine bars.
   (b) Measurement of angle of taper plug gauge, Taper ring gauge, V- groove, Radius of given ring by using spheres and height gauge.
3. (a) Measurement of straightness and flatness using autocollimator.
   (b) Measurement of coordinates of a jig plate.
4. (a) To find module, Addendum, Dedendum, Pitch circle diameter, Tooth width, Pressure angle of a given spur gear by using gear teeth vernier
   (b) Measurement of effective diameter of an external thread by using Two Wire/Three wire method.
5. (a) Study of screw thread profile using Tool Makers microscope.
   (b) Measurement of gear elements using profilometer.
6. (a) Measurement of straightness and flatness using spirit level and Autocollimator.
   (b) Measurement of surface measurement by using Talysurf instrument.
7. Checking the limits of dimensional tolerances using comparators (Mechanical/Pneumatic/Electrical)
8. (a) Alignment test on lathe machine
   (b) Alignment on milling machine

PART-B: MEASUREMENTS LAB

1. Study of Instruments
2. Calibration of Bourdon Pressure Gauge.
3. Calibration of transducer for temperature measurement (RTD).
4. Study and calibration of LVDT transducer for displacement measurement.
5. Calibration of strain gauge for load measurement.
6. Calibration of capacitive transducer for angular displacement.
7. Study and calibration, measurement of speed pickups using Stroboscope.
8. Study of Piezo electric transducer.

IV B.Tech. I Semester

10BT70314 : MANUFACTURING SYSTEMS LAB

L	T	P	C
-	-	3	2

1. Solving LPP, Transportation, assignment problems using excel solver and OR packages.
2. Solving inventory, scheduling lot sizing problems using manufacturing systems simulation software
3. Solving queuing problem and layout optimization using manufacturing systems simulation software
4. Building simulation models for manufacturing operations with layout and transport system.
5. Project evaluation and review based on time and cost
6. Weibull reliability plot creation using component / product failure data
7. Line balancing using manufacturing systems simulation software
8. Current state and future state mapping using value stream mapping software
9. Process capability studies using statistical software
10. Analysis of DoE results using statistical software
11. Statistical Analysis of Simulation models (input analysis)
12. Statistical Analysis of Simulation models (output analysis)
13. 5S practice / Poke Yoke for workplace improvement
14. Design and simulation of a simple manufacturing system using ProModel software.
15. Design and simulation of a simple manufacturing system using Arena software.

At least one software package(s) from each area to be practiced

(a) Statistics : SYSTAT/MINITAB/SPSS/SAS
(b) Simulation : ARENA/ProModel/QUEST/WITNESS
(c) OR packages : LINGO/EXCEL SOLVER/SIGMAPLOT

IV B.Tech. II Semester

10BT80301 : WORLD CLASS MANUFACTURING

L	T	P	C
4	-	-	4

UNIT – I: GAINING COMPETITIVE EDGE THROUGH WORLD CLASS MANUFACTURING

Manufacturing excellence and competitiveness, World Class Manufacturing models, The philosophy of world-class Manufacturing-The First Principles of World-Class Manufacturing, The practices of World-Class Manufacturing-the customers interface, The supplier interface, World-Class Practices in the factory.

UNIT – II: STRATEGIES FOR BUSINESS EXCELLENCE

Balanced scorecard- sustainable balanced scorecard, Policy deployment, Benchmarking, Value Stream Mapping, Activity Based Costing, Continuous improvement, Innovations.

UNIT – III: REENGINEERING

Definition of Reengineering, importance of 3Cs – customers take charge, Competition intensifies and change becomes constant, Fundamentals of rethinking, radical redesign and dramatic improvement, Rethinking business process: new world of and enabling role of information technology, Enterprise resource planning, Business intelligence tools.

UNIT – IV: TOTAL QUALITY MANAGEMENT

History of TQM, Axioms of TQM, Contribution of Quality Gurus – Deming's approach, Juran's quality trilogy, Crosby and quality treatment, Imai's Kaizen, Ishikawa's company wide quality control, and Feigenbaum's theory of TQC, Four Revolutions in Management thinking; Customer focus, Continuous Improvement, Total participation, and Societal Networking, Focus on customers: Change in work concept, Market-in, and customers, Quality Function Deployment.

UNIT – V: QUALITY MANAGEMENT SYSTEMS

ISO 9000 series of standards, Sector specific standards, Implementation, Documentation, Internal audits, registration, Environment management system – ISO 14000 series standards – integrating ISO 14000 with ISO 9000.

UNIT – VI: SIX SIGMA

Six sigma basics, DMAIC process, Design for Six Sigma (DFSS) and the customer, Quality time and the bottom line, Core of DFSS - IDOV method, DFSS metrics, DFSS infrastructure – people and resources, Implementing DFSS, Integrating lean and six sigma.

UNIT – VII: TOTAL PRODUCTIVE MAINTENANCE

Introduction, The Plan, Learning the New Philosophy, Promoting the Philosophy, Training, Improvement Needs, Goal, Developing Plans, Autonomous work groups maintenance, Prevention, reducing break down & other losses, Advantages of TPM, Implementing TPM: Integrating TPM into the company, Measuring overall equipment effectiveness (OEE), Framework for TPM implementation, Steps in TPM implementation

UNIT – VIII: CONTEMPORARY TOPICS

Concurrent Engineering(CE) – introduction, Basic principles, Components of CE models, Benefits, co-operative concurrent teams, Elementary treatment on digital manufacturing, e-manufacturing, reconfigurable manufacturing, Corporate governance, Corporate social responsibility.

TEXT BOOKS:

1. Sahay.B.S, Saxena.K.B.C, Ashish Kumar, *World Class Manufacturing- A Strategic Perspective*, MacMillan.
2. Hammer, Michael and James Champy, *Re-engineering the corporation-A Manifesto for Business revolution*, HarperBusiness London.
3. Dale H. Besterfield, etal, *Total Quality Management*, Prentice Hall.

REFERENCE BOOKS:

1. Dennis Pascal, Lean Production Simplified: *A Plain Language Guide To The World's Most Powerful Production System*, New York Productivity Press.

IV B.Tech. II Semester

10BT80302 : NON-CONVENTIONAL ENERGY SOURCES (ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION
Sources of Energy, Role and potential of new and renewable sources PRINCIPLES OF SOLAR RADIATION: The solar energy option, Environmental impact of solar power, solar radiation geometry, The solar constant, Extraterrestrial and terrestrial solar radiation, Solar radiation on tilted surface, Instruments for measuring solar radiation, Solar radiation data.

UNIT – II: SOLAR ENERGY COLLECTION
Flat plate and concentrating collectors, Classification of concentrating collectors, Orientation and thermal analysis, Advanced collectors.

UNIT – III: SOLAR ENERGY STORAGE AND APPLICATIONS
Different methods, Sensible, Latent heat and stratified storage, Solar ponds. Solar Applications- solar heating/cooling technique, Solar distillation and drying, Photovoltaic energy conversion.

UNIT – IV: WIND ENERGY
Sources and potentials, Principle and efficiency of wind turbine, Horizontal and vertical axis wind mills, Design factors of wind mill, Performance characteristics, Betz criteria

UNIT – V: BIO-MASS
Principles of Bio-Conversion, Anaerobic/aerobic digestion, Types of Bio-gas digesters, Gas yield, combustion characteristics of bio-gas, Utilization for cooking, Thermal pyrolysis and gasification.

UNIT – VI: GEOTHERMAL ENERGY
Resources, types of wells, Methods of harnessing the energy, Potential in India, Applications of geothermal energy.

UNIT – VII: OCEAN ENERGY
Ocean Thermal Electric Conversion (OTEC), Principle - utilization, Setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, Mini-hydel power plants, and their economics.

UNIT – VIII: DIRECT ENERGY CONVERSION

Need for direct energy conversion, Carnot cycle, Limitations, Principles of direct energy conversion, Thermo-electric generators, Seebeck, Peltier and Joule Thomson effects, Figure of merit, materials, applications, Magneto Hydro Dynamic (MHD) generators, Principles, Dissociation and ionization, Hall effect, magnetic flux, MHD accelerator, MHD Engine, Power generation systems, Electron gas dynamic conversion, Economic aspects, Fuel cells, Principles, Faraday's laws, Thermodynamic aspects, Selection of fuels and operating conditions.

TEXT BOOKS:

1. G.D. Rai, *Non-Conventional Energy Sources*, 5th edition, Khanna Publishers, 2011.
2. G.N.Tiwari and M.K.Ghosal, *Fundamentals of Renewable Energy Resources*, Narosa publications, 2007.

REFERENCE BOOKS :

1. John Twidell, Anthony D. Weir, *Renewable Energy Sources*, 2nd edition, Taylor & Francis, 2005.
2. Khan, B.H., *Non-Conventional Sources*, 2nd Edition, TMH, 2009.
3. B.S.Magal, Frank Kreith & J.F.Kreith, *Solar Power Engineering*, McGrawhill, 1994.
4. Solanki, *Renewable Energy Sources and Emerging Technologies*, PHI.
5. Ashok V Desai, *Non-Conventional Energy*, New Age International, 2003.
6. K Mittal, *Non-Conventional Energy Systems*, Wheeler.

IV B.Tech. II Semester

10BT80303 : NON-TRADITIONAL MACHINING PROCESSES
(ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT – I: INTRODUCTION
Need for non-traditional machining methods, Classification of modern machining processes, Comparative study of different processes, Considerations in process selection, Materials-its applications.

UNIT – II: ULTRASONIC MACHINING
Elements of the process, Mechanics of metal removal process parameters, Tool feed mechanism, Economic considerations, Applications and limitations, Effects of ultrasonic machining on materials.

UNIT – III: ABRASIVE JET MACHINING & WATER JET MACHINING
Basic principles, Types of abrasives, Types of equipments, Process variables, Mechanics of metal removal, Applications, Limitations.

UNIT – IV: ELECTRO–CHEMICAL PROCESSES
Fundamentals of electro chemical machining, Metal removal rate in ECM, Tools, Surface finish and accuracy, Economic aspects of ECM, Simple problems for estimation of metal removal rate, Electro Chemical Grinding, Electro Chemical Honing and Deburring process.

UNIT – V: THERMAL METAL REMOVAL PROCESSES
General principle and applications of Electric Discharge Machining, Electric Discharge Grinding and Electric Discharge Wire cutting processes, Power circuits for EDM, Mechanics of metal removal in EDM, process parameters, Selection of tool electrode and dielectric fluids, Methods of surface finish and machining accuracy, Characteristics of spark eroded surface and machine tool selection, Wire EDM-principle & its applications.

UNIT – VI: ELECTRON BEAM MACHINING
Generation and control of electron beam for machining, Theory of electron beam machining, Comparison of thermal and non-thermal processes, Applications, Advantages, Limitations.
LASER BEAM MACHINING: General principle and application of laser beam machining, Thermal features, Cutting speed and accuracy of cut, Laser drilling.

UNIT – VII: PLASMA ARC MACHINING

Principle, Metal removal mechanism, Process parameters, Accuracy and surface finish, Applications, Advantages and limitations.

Chemical Machining- fundamentals of chemical machining- principle- maskants –etchants- advantages and applications.

UNIT – VIII:MAGNETIC ABRASIVE FINISHING AND RAPID PROTOTYPING

Magnetic abrasive finishing, Abrasive flow finishing, Electro stream drilling, Shaped tube electrolytic machining.

Rapid Prototyping: Classification – stereo lithography-selective laser sintering, applications.

TEXT BOOKS:

1. Pandey, P.C. and Shah H.S., *Modern Machining Process*, TMH.
2. V.K. Jain, *Advanced Machining Processes*, Allied publishers.

REFERENCE BOOKS:

1. Bhattacharya A, *New Technology*, The Institution of Engineers, India
2. Kalpakzian, *Manufacturing Technology*, Pearson.

IV B.Tech. II Semester

10BT80304 : GEOMETRIC MODELLING
(ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT – I

Introduction, Application area of Computer graphics, Overview of graphic system, Video - display devices, Raster- scan systems, Random scan systems, Graphics monitors and work stations and input devices.

UNIT – II

Output primitives: Points and lines, Line drawing algorithms, Mid-point circle algorithm, Filled area primitives: Scan-line polygon fill algorithm, Boundary-fill and flood –fill algorithm.

UNIT – III

2-D geometrical transformations: Translation, Scaling, Rotation, Reflection and shear transformation matrix representations and homogeneous co-ordinates, Composite transformations, Transformations between coordinates.

UNIT – IV

2-D viewing: The viewing pipeline, Viewing coordinate reference frame, Window to view–port-co-ordinate transformations, Viewing function, Cohen-Sutherland and Cyrus –beck line clipping algorithms, Sutherland-Hodgeman polygon clipping algorithm.

UNIT – V

3-D object representation: Polygon surfaces, Quadric surfaces, Spline representation, Hermite curve, Bezier curve and B-spline curve, Bezier and B-spline surfaces, Basic illumination models, shading algorithms.

UNIT – VI

3-D geometric transformations: Translation, Rotation, Scaling, Reflection and shear transformation and composite transformations.

UNIT – VII

Visible surface detection methods: Classification, Back-face detection, Depth - buffer, Scan - line, Depth sorting.

UNIT – VIII:
Computer animation: Design of animation sequence, General computer animation functions, Raster animation, Computer animation language, Key frame system, Motion specification.

TEXT BOOKS:

1. David F Rogers, *Mathematical Elements for Computer Graphics*, TMH.
2. M.C. Trivedi, *Computer Graphics and Animation*, Jaico Publications.

REFERENCE BOOKS:

1. Donald Hearn and M.Pauline Baker, *Computer Graphics C version*, Pearson.
2. Ibrahim Zeid, *CAD/CAM Theory and Practice*, TMH.
3. Zhigand Xiang, Roy Plastock, *Computer Graphics*, 2nd Edition, Schaum's outlines, TMH.
4. Steven Harrington, *Computer Graphics*, TMH.
5. Shalini Govil, *Principles of Computer Graphics*, PHI, 2005, Springer.
6. C.Foley, Vindom, Fener, Hughes, *Computer Graphics Principles & Practice*, 2nd Edition, Pearson.

IV B.Tech. II Semester

10BT80305 : PROFESSIONAL ETHICS AND INTELLECTUAL PROPERTY RIGHTS
(ELECTIVE – III)

L	T	P	C
4	-	-	4

UNIT – I: NATURE AND SCOPE OF ENGINEERING ETHICS
Definition, Nature, Scope- Moral Dilemmas- Moral Autonomy- Kohlberg's theory- Gilligan's theory, Profession - Persuasive, Definitions, Multiple motives, Models of professional goals, Moral Reasoning and Ethical theories – professional ideals and virtues- theories of right action, Self- interest, Customs and regions- use of ethical theories.

UNIT – II: ENGINEERING AS SOCIAL EXPERIMENATION
Engineering as experimentation- Engineers as responsible experimenters, The challenger case, Codes of ethics, A balanced outlook on law.

UNIT – III: ENGINEER'S RESPONSIBILITY FOR SAFETY
Concept of safety and risk, Assessment of safety and risk- risk benefit analysis and reducing the risk- three - mile island, Chernobyl and safe exists.

UNIT – IV: GLOBAL ISSUES
Multinational corporations- environmental ethics- computer ethics and weapons developments

UNIT – V: INTRODUCTION TO INTELLECTUAL PROPERTY
Meaning and types of intellectual property, Intellectual property law basics, Agencies responsible for intellectual property registration, International organizations, Agencies and treaties, Importance of intellectual property rights.

UNIT – VI: FOUNDATIONS OF TRADEMARKS
Meaning of trademarks, Purpose and functions of trademarks, Types of marks, Acquisition of trademark rights, Common law rights, Categories of marks, Trade names and business name, Protectable matter, Exclusions from trademark protection

UNIT – VII: FOUNDATIONS OF COPYRIGHTS LAW
Meaning of copyrights, Common law rights and rights under the 1976 copyright Act, Recent developments of the Copyright Act, The United States Copyright Office

UNIT – VIII: FOUNDATIONS OF PATENT LAW

Introduction, Meaning of patent Law, Rights under federal Law, United states patent and trademark office, Patentability, Design Patents, Plants patents, Double Patenting.

TEXT BOOKS:

1. Mike Martin and Roland Schinzinger, *Ethics in Engineering*, TMH.
2. Deborah E. Bouchoux, *Intellectual Property Rights*, Cengage.

REFERENCE BOOKS:

1. Jayashree Suresh & B.S. Raghavan, *Human values and Professional Ethics*, S. Chand.
2. Govindarajan, Natarajan and Senthilkumar, *Engineering Ethics*, PHI.
3. Nagarajan, *A Text Book on Professional Ethics and Human values*, New Age International.
4. Charles & Fleddermann, *Engineering Ethics* ,Pearson.
5. Rachana Singh Puri and Arvind Viswanathan, *Practical Approach to Intellectual Property Rights*, I.K. International Publishing House, New Delhi. 2010.
6. A.B.Rao, *Business Ethics and Professional Values*, Excel.

IV B.Tech. II Semester

10BT80306 : COMPUTATIONAL FLUID DYANAMICS
(ELECTIVE – IV)

L	T	P	C
4	1	-	4

UNIT – I

Number system and errors, Representation of integers, Fractions, Floating point Arithmetic, Loss of significance and error propagation, Condition and instability, Computational methods for error estimation, Convergence of Sequences.

UNIT – II

Solution of a system of simultaneous linear algebraic equations, Iterative schemes of matrix inversion, Direct methods for matrix inversion, Direct methods for banded matrices.

UNIT – III

Finite difference applications in heat conduction and convention - heat conduction, Steady heat conduction in a rectangular geometry, Transient heat conduction, Finite difference application in convective heat transfer.

UNIT – IV

Finite Differences, Discretization, Consistency, Stability, and Fundamentals of fluid flow modeling: Introduction, Elementary finite difference quotients, Implementation aspects of finite-difference equations, Consistency, Explicit and implicit methods.

UNIT – V

Introduction to first order wave equation, Stability of hyperbolic and elliptic equations, Fundamentals of fluid flow modeling, Conservative property, The upwind scheme.

UNIT – VI

Review of equations governing fluid flow and heat transfer: Introduction, Conservation of mass, Newton's second law of motion, Expanded forms of Navier-stokes equations, Conservation of energy principle, Special forms of the Navier-stokes equations.

UNIT – VII

Steady flow, Dimensionless form of momentum and energy equations, Stokes equation, conservative body force fields, Stream function - Vorticity formulation.

UNIT – VIII

Finite Volume Method: Approximation of surface integrals, Volume integrals, Interpolation and differentiation practices, Upwind interpolation, Linear interpolation and Quadratic interpolation

TEXT BOOKS:

1. Nu Suhas V. Patankar, *Numerical Heat Transfer and Fluid Flow*, Butter-Worth Publ.
2. John. D. Anderson, *Computational Fluid Dynamics, Basics with Applications*, Mc Graw Hill.
3. Fun Tapan K. Sengupta, *Fundamentals of Computational Fluid Dynamics*, Universities Press.

REFERENCE BOOKS:

1. Niyogi, *Computational Fluid Flow and Heat Transfer*, Pearson.
2. Jiyuan and Others, *Computational Fluid Dynamics*, Elsevier.

IV B.Tech. II Semester

10BT80307 : SUPPLY CHAIN MANAGEMENT
(ELECTIVE – IV)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION TO SCM

Definition, Global optimization, Objectives of SCM, The Objective of a Supply Chain, The importance of Supply Chain Decisions, Decision Phases in a Supply Chain, Process View of Supply Chains, Importance of supply chain. Competitive and Supply Chain Strategies, Achieving Strategic fit, Expanding Strategic Scope.

UNIT – II: SUPPLY CHAIN DRIVERS

Framework of Supply chain Drivers, Inventory, Facilities, Information, Transportation, Sourcing and Pricing, Obstacles to achieve strategic fit.

UNIT – III: INVENTORY MANAGEMENT

Introduction, Single warehouse, Inventory examples, Economic lot size model, Effect of demand uncertainty, Risk pooling, Centralized and decentralized system, Managing inventory in the supply chain, Forecasting.

UNIT – IV: VALUE OF INFORMATION

Bullwhip effect, Information and supply chain technology, Supply chain integration - push - pull and push-pull system, Demand driven strategies, Impact of internet on SCM, Distribution strategies.

UNIT – V: DESIGNING AND PLANNING TRANSPORATATION NETWORKS

The role of transportation in a Supply chain, Modes of transportation and their performance characteristics, Transportation infrastructure and policies, Design options for a transportation network, Trade-offs in transportation design, Tailored transportation, The role of IT in transportation, Problems.

UNIT – VI: STRATEGIC ALLIANCES

Framework for strategic alliance, Third party logistics, Retailer, Supplies partnership, Distributor - integration, Procurement and out servicing strategies.

UNIT – VII: INTERNATIONAL ISSUES IN SCM

Introduction, Risks and advantages- design for logistics, Supplies integration into to new product development, Mass customization, Issues in customer value.

UNIT – VIII: INFORMATION TECHNOLOGY FOR SCM

Goals, Standardization, Infrastructure, DSS for supply chain management.

TEXT BOOKS:

1. Sunil Chopra & Peter Meindl, *Supply Chain Management - Strategy, Planning & Operation*, 4th Edition, Pearson Education Asia.
2. Janat Shah, *Supply Chain Management*, Pearson.

REFERENCE BOOKS:

1. Thomas E Vollman and Clay Whybark D, *Manufacturing Planning and Control for Supply Chain Management*, Tata McGraw Hill, Fifth Edition, New Delhi, 2005
2. Simchi Levi Davi, Kaminsky Philip and Simchi-Levi Edith, *Designing and Managing the Supply Chain*, Tata McGraw Hill, New Delhi.

IV B.Tech. II Semester

10BT80308 : RAPID PROTOTYPING
(ELECTIVE – IV)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION
Need for the compression in product development, History of RP systems, Survey of applications, Growth of RP industry and classification of RP systems, STEREO LITHOGRAPHY SYSTEMS: Principle, Process parameters, Process details, Data preparation, Data files and machine details, Applications.

UNIT – II: SELECTIVE LASER SINTERING
Type of machine, Principle of operation, Process parameters, Data preparation for SLS, Applications, Fused Deposition Modelling: Principle, Process parameter, Path generation, Applications.

UNIT – III: SOLID GROUND CURING
Principle of operation, Machine details, Applications. Laminated Object Manufacturing: Principle of operation, LOM materials, Process details, applications.

UNIT – IV: CONCEPTS MODELERS
Principle, Thermal jet printer, Sander's model market, 3-D printer. Genisys Xs printer HP system 5, object Quadra systems.

UNIT – V: RAPID TOOLING
Indirect Rapid tooling, Silicone rubber tooling, Aluminum filled epoxy tooling, Spray metal tooling, Cast kirksite, 3Q keltool, Direct Rapid Tooling.

UNIT – VI: TOOLING
Quick cast process, Copper polyamide, Rapid Tool, DMILS, Prometal, Sand casting tooling, Laminate tooling soft Tooling vs. hard tooling.

UNIT – VII: SOFTWARE FOR RP
STL files, Overview of Solid view, magics, imics, magic communicator, etc. Internet based software, Collaboration tools, RAPID.
MANUFACTURING PROCESS OPTIMIZATION: Factors influencing accuracy, Data preparation errors, Part building errors, Error in finishing, Influence of build orientation.

UNIT – VIII: ALLIED PROCESSES

Vacuum, Casting, Surface digitizing, Surface generation from point cloud, Surface modification - data transfer to solid models.

TEXT BOOKS:

1. Paul F. Jacobs, *Stereo Lithography and Other RP & M Technologies*,: SME, NY
2. Fulham D.T & Dinjoy S.S Verlog, *Rapid Manufacturing*, London.

REFERENCE BOOKS:

1. Terry Wohlers Wohler's Report 2000, *Rapid Prototyping*, Wohler's Association 2000.
2. Gurumurthy, *Rapid Prototyping Materials*, IISc Bangalore.

IV B.Tech. II Semester

10BT80309 : MICRO ELECTRO MECHANICAL SYSTEMS (ELECTIVE – IV)

L	T	P	C
4	1	-	4

UNIT – I: INTRODUCTION
Basics of MEMS & Microsystems, Evolution of micro fabrication, Microsystems & micro electronics, miniaturization, Microsystems versus MEMS, Micro system design and manufacture, Applications.

UNIT – II: WORKING PRINCIPLES OF MICROSYSTEMS
Introduction, Micro sensors - chemical - pressure and thermal sensors, Micro actuation - using thermal forces, Shape memory alloys, Electrostatic forces, MEMS with micro actuators-microgrippers, Micromotors, Microvalves, Micro accelerometers.

UNIT – III: ENGINEERING MECHANICS FOR MICROSYSTEMS DESIGN
Introduction, Static bending of thin plates – circular and rectangular plates, Mechanical vibration, thermo mechanics, Fracture mechanics.

UNIT – IV: MICROMACHINING TECHNOLOGIES
Silicon as a material for micromachining, Thin film deposition, Lithography, Etching, Silicon micromachining – bulk and surface micromachining, LIGA process, Specialized materials for Microsystems– Polymers, Piezoelectric crystals.

UNIT – V: MICROSYSTEMS DESIGN
Design considerations, Process design, Mechanical design – thermomechanical loading, Thermomechanical stress analysis, Design of a silicon die for a micropressure sensor.

UNIT – VI: MICROFLUIDIC SYSTEMS
Important considerations on microscale fluid, Properties of fluids, Analytical expressions for liquid flow in a channel, Fluid actuation methods, Dielectrophoresis, Electrowetting, Electrothermal flow, Typical microfluidic channel, Microfluid dispenser, Microneedle molecular gate, Micropumps, Microfluidic design considerations.

UNIT – VII: SCALING LAWS IN MINIATURIZATION
Introduction to scaling, Scaling in geometry, Rigid body dynamics, Scaling in Mechanical, Electrostatic, Magnetic and Thermal domains.

UNIT – VIII: MICROSYSTEMS PACKAGING

Objectives of packaging, Mechanical packaging of microelectronics, Micro system packaging, Packaging technologies, Reliability and key failure mechanisms, Pressure sensor packaging.

TEXT BOOKS:

1. Tai-Ran Hsu, *MEMS and Micro systems Design and Manufacture*, TMcGraw Hill.
2. G.K.Anantha Suresh, K.J. Vinoy, S. Gopalakrishnan, K.N.Bhat, V.K.Aatre, *Micro & Smart Systems*, Wiley Publications.

REFERENCE BOOKS:

1. Rai-Choudhury, *MEMS and MOEMS Technology and Applications*, PHI, 2011.
2. Nitaigour Premchand Mahalik, *MEMS*, TMH.
3. S.D. Senturia, *Microsystems Design*, Kluwer Academic Publishers, Boston.
4. Minhang Bao, *Analysis and Design Principles of MEMS Devices*, Elsevier, Amsterdam, The Netherlands.
5. V.Varadan, K.J.Vinoy, S.Gopalakrishnan, *Design and Development Methodologies, Smart Material Systems and MEMS*, Wiley.

Rules of Disciplinary Action for Malpractice/Improper conduct in Examinations

S. No.	Nature of Malpractice / Improper Conduct	Rule No.	Punishment
1.	Possession of unauthorised material in printed or handwritten form or electronic devices	Rules 1(a), 1(b)	Expulsion from the examination hall and cancellation of examination in that subject. If any outside person involves and helps the candidate for malpractice, the outside person is handed over to the police and a case is registered.
2.	If the candidate copies evidently from various sources like, hand written material, typewritten or Photostat material, writing on body arms or clothes, writing with pen/pencil on calculators, scales, hall ticket, rubber etc.	Rule 2	Expulsion from the examination hall and cancellation of exam in that subject and all other subjects the candidate has appeared, including practical examinations and project work. He/she shall not be permitted to appear for the remaining examinations.
3.	If any person impersonates the other candidate in the examination.	Rule 3	If the person is a student of the College he shall be expelled from examination and debarred. He shall forfeit the seat. The performance of the original candidate is cancelled for that series of examination and debarred for two semesters. If the person is an outsider, he/she shall be handed over to the police and a case is registered.
4.	If the candidate attempts to steal/mutilate/damage (or) tries to send out the answer book (or) Takes out (or) arranges to send out the question paper during the examination.	Rule 4	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared, including practical examinations and project work. He/she shall not be permitted for the remaining examinations of the courses in that semester/year. The candidate is also debarred for two consecutive semesters. **This matter shall be reported to police and a case is registered**

5.	If the candidate uses objectionable, abusive or offensive language in the answer paper, or writes to the examiner requesting him to award pass marks.	Rule 5	Cancellation of the perfor-mance in that course.
6.	If the candidate refuses to obey the examination authorities (or) misbehaves (or) creates disturbance of any kind in and around the examina-tion hall (or) organizes a walk out, (or) threatens (or) assaults the invigilator and indulges in the act of misconduct, destruction of property on the campus.	Rule 6	In case of students of the college, they shall be expelled from examination and their examination performance stands cancelled. In case of outsiders, they will be handed over to the police and a case is registered against them.
7.	If the candidate possesses any lethal weapon or firearm in the examination hall.	Rule 7	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared, including practical examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. **This matter shall be reported to police and a case is registered**
8.	If a student of the College, who is not a candidate for the particular exam or any person not connected with the College indulges in any malpractice or improper conduct mentioned in clauses 6 and 7.	Rule 8	For student of the College expulsion from the examination hall and cancellation of the performance in that series of examination. The candidate is also debarred and forfeits the seat. For persons who do not belong to the college will be handed over to the police and a case is registered.

9.	If the candidate comes in an intoxicated/inebriated condition to the examination hall.	Rule 9	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared, including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year
10.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Rule 10	Cancellation of the performance in that subject and all other subjects the candidate has appeared, including practical examinations and project work of that semester/year examinations.
11.	If any malpractice is detected which is not covered in the clauses 1 to 10 above, shall be brought to the notice of the Chief Controller of Examinations.		

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

Salient Features of Prohibition of Ragging in Educational Institutions Act 26 of 1997

- Ragging within or outside the College is prohibited.
- Ragging means doing an act which causes or is likely to cause insult or annoyance or fear or apprehension or threat or intimidation or outrage of modesty or injury to a student

Nature of Ragging	Punishment
Teasing, Embarrassing and humiliating	Imprisonment up to 6 months or fine up to Rs. 1,000/- or Both
Assaulting or using criminal force or criminal intimidation	Imprisonment up to 1 year or fine up to Rs. 2,000/- or Both
Wrongfully restraining or confining or causing hurt	Imprisonment up to 2 years or fine up to Rs. 5,000/- or Both
Causing grievous hurt, Kidnapping or rape or committing unnatural offence	Imprisonment up to 5 years or fine up to Rs. 10,000/-
Causing death or abetting suicide	Imprisonment up to 10 years or fine up to Rs. 50,000/-

Note:

1. A student convicted of any of the above offences, will be expelled from the College.
2. A student imprisoned for more than six months for any of the above offences will not be admitted in any other College.
3. A student against whom there is prima facie evidence of ragging in any form will be suspended from the College immediately.
4. The full text of Act 26 of 1997 **and** UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009 **(Dated 17th June, 2009) are placed in the College library for reference.**

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

(Affiliated to JNT University Anantapur)

ACADEMIC REGULATIONS FOR THE AWARD OF FULL TIME M.Tech. DEGREE

(WITH EFFECT FROM THE ACADEMIC YEAR 2010-11)

For pursuing Two year degree program of study in Master of Technology (M.Tech.) offered by Sree Vidyanikethan Engineering College under Autonomous status and herein after referred to as SVEC (Autonomous):

1. Applicability : All the rules specified herein after and approved by the Academic council will be in force and applicable to students admitted from the academic year 2010-2011 onwards. Any reference to "college" in these rules and regulations stands for **Sree Vidyanikethan Engineering College (Autonomous).**

2. Extent : All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sree Vidyanikethan Engineering College shall be the Chairman, Academic Council.

3. Academic System

3.1. Academic Year : The College shall follow semester pattern for the two year M.Tech. program for conducting all its curricula. An academic year shall consist of two semesters with semester break after 1st & 3rd Semesters and summer break after 2nd semester.

3.1.1. Duration : Each semester shall have a duration to accommodate a minimum of **17 weeks** instruction.

3.1.2. Academic Calendar: The College shall prepare academic calendar for each academic year in advance and notify the calendar approved by the Academic Council.

3.2. Credits and Grading System : In M.Tech. program of studies, Credit system will be followed for design of curriculum and grading system will be followed in evaluation. Examination results are announced using Cumulative Grade Point Average (CGPA) on a **ten point scale** as described under Sec. 6.5.

3.3. Examination system: All components (Theory subjects/Labs/Industrial visit/Project) of this program of studies shall be evaluated continuously through an internal evaluation and an external evaluation conducted as end-semester examination and as stipulated under sections 6.1 through 6.3.

4. Admissions and Admission modalities

4.1. Admission into first year of Two Year M.Tech. program of studies:

4.1.1. Admissions: Admissions are made into the first year of TWO YEAR M. Tech Degree Programme as per the stipulations of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

(a) By the Convener, PGEC/PGECET (for Category–A Seats)
(b) By the Management (for Category – B Seats)

Name of the specialization	Offered by the Department	Name of the Degree / Branch eligible for Admission
Electrical Power Systems	EEE	B.Tech / BE / AMIE in Electrical Engg. or equivalent
Digital Electronics & Communication Systems	ECE	B.Tech / BE / AMIE in ECE, AMIE (Electronics & Telecommunication Engg.) / AMIETE (Electronics & Telematics Engg.) or equivalent
VLSI		
Communication Systems		
Software Engineering	IT	B.Tech / BE / AMIE in CSE / CSIT / Electronics & Computers Engg. / IT / Computer Science and Systems Engg. or equivalent
Computer Science	CSE	B.E./B.Tech/AMIE in any Branch of Engg. / Tech. (or) equivalent Master's Degree in Physics Statistics, Mathematics or Applied Mathematics, Applied Statistics, Applied physics, Geophysics, M.Sc (Comp. Sc.), M.Sc. (Information Systems), (Computer Applications and Electronics) and MCA (or) Equivalent (CS)
Computer Networks and Information Security	CSE	B.Tech/BE/AMIE in CSE/ECE/CSIT/IT/ETM/EEE/EIE & CSSE equivalent (or) MCA
Bio-Technology	Bio.Tech.	B.Tech / BE / AMIE : Chemical Engineering / Bio-Technology / Biochemical Engineering / Bio-Informatics / Agricultural Engineering or M.Sc. in Environmental Sciences/ Chemistry / Biochemistry / Microbiology / Biotechnology/ Life Sciences / B.V.Sc / MBBS / BDS / B.Pharmacy/Food Technology

4.1.2. Eligibility and Admission Procedure:

Admission to the above Program shall be made subject to the eligibility, qualifications and specialization prescribed by the Academic Council for each program, from time to time.

4.1.2.1. A candidate must have a minimum percentage of marks in the qualifying degree as prescribed by the AICTE or Government at the time of admission.

4.1.2.2. Admissions under General category & SC/ST Category shall be made either on the basis of merit rank obtained by the qualified candidates at an Entrance Test GATE / PGECET score, subject to reservations prescribed by the AICTE or Government policies from time to time. However, the candidate need not satisfy clause 4.1.2.1, if he qualifies in GATE/PGECET.

4.1.2.3. Sponsored category seats shall be filled-up with the candidates working in an Industry / Academic Institutions approved by AICTE. Candidate must have a minimum of two years of experience after the qualifying degree. Moreover, the candidate should satisfy the clause 4.1.2.1.

5. Credit System:

5.1. Contact Hours: Depending on the complexity and volume of the course the number of contact hours per week will be determined.

5.1.1. Credits: (i) As a norm, for the theory subjects, **one credit** per one contact period per week is assigned.

(ii) As a norm, for practical courses **two credits** will be assigned for three contact periods/week.

(iii) For courses like Industrial Visit/Project Work Phases–I&II where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

Norms for assigning credits are shown in Table 1.

Table 1

Subject	Period/Week	Credits
Theory	01	01
Practical	03	02
Industrial Visit/Seminar	--	02
Project Work Phase-I	--	04
Project Work Phase-II	--	12

5.2 Transitory Regulations

a) Curriculum of program of studies pursued earlier, by such candidate(s) is taken up on case by case basis and examined for equivalences to the relevant program of studies prescribed by SVEC (Autonomous) for the award of M.Tech. degree through SVEC (Autonomous).

b) Based on the detailed syllabus, equivalent course(s) are identified and concerned Board of Studies will certify such equivalence.

c) Credits are transferred for all such equivalent courses and treated as **"successfully completed"** in the program of studies prescribed by SVEC (Autonomous).

d) A program chart of residual courses not cleared will be prepared and a program of studies with duration specified will be prescribed for pursuit at SVEC (Autonomous).

5.2.1. All other modalities and regulations governing shall be the same as applicable to the batch of students into which a candidate is readmitted.

5.3. Curriculum for M.Tech.

- The two year curriculum for M.Tech. program formulated based on clause 5.1 shall have a total of **70 credits**. The exact requirements of credits will be as recommended by the concerned Board of Studies and approved by the Academic Council.

5.4. The Maximum duration permitted:

5.4.1. The maximum duration permitted for any student to successfully complete two year M.Tech. Program of study shall be:

Four consecutive academic years from the year of admission for a student admitted into the first year of program.

5.4.2. In case, any student fails to meet all the conditions for the eligibility of degree within the maximum stipulated period as in 5.4.1, his/her admission stands cancelled.

6.0. Examination system and evaluation

6.1. Examination system: Progress in all the components taken up by all students from the program of studies in any semester will be examined through

(i) An internal evaluation and

(ii) An end-semester examination, normally conducted and evaluated by external examiners.

6.1.1. Distribution of marks for internal & end-semester examinations:

The performance of the candidate in each semester shall be evaluated subject wise, with a maximum of 100 marks for theory and 75 marks for practicals, on the basis of Internal Evaluation and End Semester Examination.

6.1.1.1 For the theory subjects 60% of the marks will be for the End-Semester Examination, while 40% of the marks will be for Internal Evaluation, based on the better of the marks secured in the two Mid Term-Examinations held, one in the middle of the Semester (Units I-IV) and another immediately after the completion of instructions (Units V-VIII). The Mid-Term Examination question paper shall be set with Five questions out of which four are to be answered. All questions carry equal marks. For End-Semester examination, the question paper will be set unit wise. Candidate has to answer any Five out of 8 questions. All question carries equal marks.

6.1.1.2 For practical subjects, 50 marks shall be for the End-Semester Examination and 25 marks will be for internal evaluation based on the day to day performance. Laboratory Exam must be conducted with two Examiners, one of them being Lab class teacher and the other must be a different teacher who has not handled the lab and must belong to the same department. The latter shall be appointed by the Principal on the recommendations of the concerned HOD.

6.1.1.3 A candidate shall be deemed to be successful in Theory/Practical/ Project Work courses if he secures a minimum of 40% of marks in the End-Semester Examination and a minimum aggregate of 50% of the total marks in the End semester and Internal-Evaluation taken together.

6.1.1.4 A student can opt for (a) Industrial Visit or (b) Seminar at the end of first semester, subject to the approval by the DC.

(a) For Industrial Visit there shall be an internal evaluation for 50 marks. A student shall visit an Industry related to his specialization and conduct a detailed study in a specialized area for a period not less than two weeks duration. Student shall submit a report to the department and give an oral presentation before the DC.

(b) For the seminar, the student shall collect information on a specialized topic, submit a technical report, showing his understanding over the topic to the Department before oral presentation. The report and the presentation shall be evaluated by the DC for 50 marks.

The student has to secure a minimum of 50% marks to be declared successful in the Industrial Visit/Seminar. The assessment will be made by the DC prior to conducting the practical examination of II-Semester laboratory subjects.

6.1.1.5 In case a candidate does not secure the minimum academic requirement in any of the courses (as specified in 6.1.1.3, 6.1.1.4) candidate has to reappear for the End-Semester Examination either supplementary or regular in that subject.

Note: Departmental Committee (DC): The departmental committee consists of HOD, Supervisor and two senior experts in the department. The committee monitors the progress of the courses viz., Project Work/Industrial Visit/Seminar and evaluate the courses. If senior faculty is not available in the department, faculty from other department(s) may be on the DC. The DC is constituted by the Principal on the recommendations of the department Head.

6.1.2. Evaluation of Project Work:

For Project Work, every candidate is required to submit dissertation after taking up a topic approved by the Departmental Committee. This is for a duration of two semesters.

6.1.2.1. Student shall register for the Project work with the approval of Departmental Committee in the III Semester and continue the work in the IV Semester too.

6.1.2.2. The Departmental Committee (DC) shall monitor the progress of the project work.

6.1.2.3. In III Semester, Phase–I of the Project Work is to be completed. A Student has to identify the topic of work, collect relevant Literature, preliminary data, implementation tools / methodologies etc., and perform a critical study and analysis of the problem identified. He shall submit status report in two different phases in addition to oral presentation before the Departmental Committee for evaluation and award of internal marks at the end of Phase –I.

6.1.2.4. A candidate shall continue the Project Work in IV Semester (Phase – II) and submit a Project report at the end of Phase–II after approval of the Departmental Committee. During Phase–II, the student shall submit status report in two different phases, in addition to oral presentation before the DC. The DC shall evaluate the project based on the progress, presentations and quality of work.

6.1.2.5. A candidate shall be allowed to submit the dissertation only after passing all the subjects of 1^{st} and 2^{nd} semesters and then take viva-voce examination of the project. The viva-voce examination may be conducted once in three months for all the eligible candidates.

6.1.2.6. Three copies of the dissertation certified in the prescribed form by the supervisor and HOD shall be presented to the Department and one copy is to be submitted to the Chief Controller of Examinations, SVEC and one copy to be sent to the examiner.

6.1.2.7. The Department shall submit a panel of three experts for a maximum of 5 students at a time. However, the examiners for conducting viva-voce examination shall be nominated by the Chief Controller of Examinations, SVEC. If the report of the examiner is favorable, viva-voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the examiner who adjudicated the dissertation. The board shall jointly evaluate the candidates work for 100 marks. The candidates who fail in viva-voce examinations shall have to re-appear the viva-voce examination after three months.

6.1.2.8. If he fails again in the second viva-voce examination, the candidate has to re-register for the Project Work.

6.1.2.9. If a candidate desires to change the topic of the project already chosen during Phase–II, he has to re-register for Project work with the approval of the DC and repeat Phases–I&II. Marks already earned in Phase–I stands cancelled.

III - SEMESTER

Course	Periods per week		Credits	Max. Marks		
	L	P		Internal	External	Total
Project Work Phase-I	-	-	4	50	-	50
Total	-	-	4	50	-	50

IV - SEMESTER

Course	Periods per week		Credits	Max. Marks		
	L	P		Internal	External	Total
Project Work Phase-II	-	-	12	50	100	150
Total	-	-	12	50	100	150

6.1.2.10. A candidate shall be deemed to be successful in the Project Work, if he satisfies the clause 6.1.1.3.

6.1.3. Attendance Requirements: Attendance in all components is compulsory while pursuing studies in any semester and shall be as:

1. A student shall be eligible to appear for End-semester examinations if he acquires a minimum of 75% of attendance in aggregate of attendance all the subjects in a semester.
2. Shortage of Attendance below 65% in aggregate shall in NO case be condoned.
3. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.
4. Students whose shortage of attendance is not condoned in any semester are not eligible to take their End-Semester examination of that Semester and their registration shall stand cancelled.
5. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the present semester, as applicable. They may seek re-admission for that semester when offered next.
6. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

6.1.4.1. Attendance for Extra-Curricular Achievements:

Attendance at N.S.S/N.C.C. Camps, Inter-Collegiate/Inter-University / Inter-State / International matches / Debates / Educational excursions or such other Inter-University activities, as approved by the College, involving out-station journeys, will not be counted as absence.

6.1.4.2. Condonation of Shortage of Attendance

In special cases and for sufficient cause shown, the Principal, on the recommendation of the Head of the concerned department, may condone the deficiency not exceeding 10% in attendance. However the candidate has to submit a requisition and pay prescribed fee.

6.2. Eligibility for appearing for the end-semester examination

6.2.1. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in 6.1.3.

i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical or project, if he secures not less than 40% of marks in the end-semester examination and a minimum of 50% of marks in the sum total of the internal evaluation and end-semester examination taken together.

ii. A student shall register in all 70 credits and earn all the 70 credits. Marks obtained in all the 70 credits shall be considered for the calculation of the class/division basing on CGPA obtained.

iii. Student who fails to earn 70 credits as indicated in the course structure within four academic years from the year of their admission shall forfeit their seat in M.Tech. course and their admission shall stand cancelled.

6.2.2. Detention: A student is said to have been detained and not allowed to appear for end-semester examination:

When the student does not have a minimum aggregate of attendance of 65% in all the subjects put together in that semester.

When a student is detained he will have to repeat that semester when offered next and he will not be allowed to register for the subjects of subsequent semesters in his program of studies.

6.2.3. Eligibility: In any semester students shall pay the prescribed examination fee and appear for the end-semester examination. They will be issued Hall Tickets and these should be carried with them in the examination hall.

6.3. Evaluation Control: Following procedures control the evaluation.

6.3.1. Marks for components evaluated internally by the faculty should be submitted to the controller of examinations one week before the commencement of the end-semester examinations.

6.3.2. Controller of examinations will collect the evaluated answer scripts of the end-semester examinations from the external examiners and tabulate the marks. The marks for the internal examination components will be added to the external marks secured in the end-semester examinations, to obtain the total marks for any subject in that semester.

6.3.3. All such performance for all courses is tabulated course-wise and will be scrutinized by the Examination Committee and moderation is applied, if required and subject wise marks lists are finalized.

6.3.4. Such total marks obtained in any subject are converted into letter grades by the Controller of Examinations.

6.3.5. Student wise tabulation is done at this stage and student wise memorandum of grades (Grade Sheet) is generated. A copy of the same is issued to the student for his purpose.

6.4. Personal verification/Revaluation/Recounting: A student can apply for Personal verification/Revaluation/Recounting within a stipulated time after receiving the grade sheet:

(i) For recounting/personal verification of the marks secured in the end-semester examinations by paying the prescribed fee or

(ii) For revaluation of the end-semester examination answer script by paying the prescribed fee.

After the recounting or re-evaluation, any changes are made the records are updated accordingly. The student will be issued a revised grade sheet. If there are no changes, the student shall be intimated the same through a letter or a notice.

6.5 Grading: After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final and total marks obtained will be converted to letter grades on a "10 point scale" as shown in the Table 2.

Table 2: Grades conversion and Grade points attached

% of Marks obtained	Grade	Description of Grade	Grade Points (GP)
≥ 95	O+	Extraordinary	10
≥ 90 & < 95	O	Outstanding	9
≥ 80 & < 90	A+	Excellent	8
≥ 70 & < 80	A	Very Good	7
≥ 60 & < 70	B	Good	6
≥ 50 & < 60	C	Pass	5
Less than 50	F	Fail	0
Not Appeared	N	Absent	0

- **Pass Marks:** A student is declared to have passed in the course, if he satisfies the clause 6.1.1.3 & 6.1.1.4. Otherwise he will be awarded fail grade-F Grade in such a course.
- **F** is considered as a FAIL grade indicating that the student has to pass the End-semester component of that subject in supplementary examinations.
- **N** is considered as absent grade indicating that the student has to pass the End-semester component of that subject in supplementary examinations.

6.6. Supplementary Examination

Apart from the regular semester end examination held at the end of each semester, the college may also schedule and conduct supplementary examinations for all subjects of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations as supplementary candidates, may have to write more than one examination per day.

6.7. Grade Point Average (GPA):

Every semester, after all the components and sub-components of all the subjects prescribed in the curriculum, a Grade Point Average (GPA) on a 10 point scale as an index of the student's performance in that semester will be calculated as given below:

$$GPA = \frac{\sum (C \times GP)}{\sum C}$$

Where C denotes the credits assigned to courses undertaken in that semester and GP denotes the grade points earned by the student in the respective courses.

* GPA is calculated for the candidates who have passed all the courses in that Semester.

6.8. Cumulative Grade Point Average:

At the end of every semester, a Cumulative Grade Point Average (CGPA) is computed on a ten point scale considering all the courses completed successfully up to that point as an index of the over all performance up to that point.

$$CGPA = \frac{\sum (C \times GP)}{\sum C}$$

Where C denotes the credits assigned to courses undertaken upto the end of the current semester and GP denotes the grade points earned by the student in the respective courses.

* The CGPA is awarded only when a student passes in all the courses prescribed for the program.

6.9. Grade Sheet: A grade sheet (Marks Memorandum) will be issued to each student indicating his/her performance in all the courses registered during semester indicating the GPA.

6.10. Transcripts: After successful completion of the total program of study, a transcript containing performance of all the academic years will be issued as a final record. Duplicate transcripts will be issued on payment of the prescribed amount of fee.

Partial transcript will also be issued up to any point of studies to a student on request after paying the stipulated fee, by the Controller of examination.

7. Award of Degree: The degree will be conferred and awarded by Jawaharlal Nehru Technological University, Anantapur on the recommendations of the Principal, SVEC (Autonomous) basing on the eligibility as mentioned in clause 7.1.

7.1. Eligibility: A student shall be eligible for the award of M.Tech. degree if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the program of studies to which he was admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his study within the stipulated time.
- Earned the specified credits in all the categories of courses.
- Obtained a CGPA of 5.0 or more. (Minimum requirements for Pass).
- Has no dues to the Institute, Hostels, Libraries, NCC/NSS etc. and any other amenities provided by the institution.
- No disciplinary action is pending against him.

7.2. Award of Class/Division: Declaration of the class/division basing on CGPA will be as stipulated in Table 3.

Table 3: Conditions for the award of degree.

Cumulative Grade Point Average	Class
> = 7.0	First Class with Distinction
> = 6.0 and < 7.0	First Class
> = 5.0 and < 6.0	Second Class

7.3. The Principal, SVEC (Autonomous) shall approve and recommend to the Jawaharlal Nehru Technological University, Anantapur for the award of a degree to any student.

8. Payment of Fee: All the students have to pay the fee of any kind prescribed by SVEC (Autonomous) as per the rules in force.

9 Withholding of Results:

If the candidate has not paid dues to the university/institute (or) if any case of indiscipline is pending against him, the result of the candidate shall be withheld and he will not be allowed/promoted into the next higher semester. The issue of degree is liable to be withheld in all such cases.

10. Additional academic regulations:

1. A student can appear for any number of supplementary examinations till he completes all the courses in which he could not clear in the first attempt.
2. A student has to acquire all the eligibility requirements within the maximum stipulated period of four years. The maximum stipulated period cannot be relaxed under any circumstances.
3. A grade sheet (marks memorandum) will be issued to the student indicating his performance in all the courses of that semester along with the GPA and CGPA.
4. A transcript containing the performance in all the components required for eligibility for award of the degree will be issued to the student.
5. Any attempt to impress upon the examiners, faculty and staff or Controller of Examinations, attempting to any unfair means or canvassing either for marks or for attendance will be treated as malpractice and the student shall be debarred from the college.
6. When a student absents himself, he is treated as to have appeared and obtained **zero marks** in that component (subject) and Grading is done so.
7. When a component is cancelled as a penalty, he is awarded **zero marks** in that component.

11. Re-Registration for Improvement of Internal Evaluation Marks:

Following are the conditions to avail the benefit of improvement of internal marks.

The candidate should have completed the course work and obtained examinations results for I & II semesters.

A candidate shall be given one chance for a maximum of Three Theory subjects for Improvement of Internal evaluation marks for which the candidate has to re-register for the chosen subjects and fulfill the academic requirements.

For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of the Principal, Sree Vidyaniketan Engineering College payable at

Tirupati along with the requisition through the concerned Head of the Department.

In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the re-registered subjects stand cancelled.

12. Amendments to Regulations

The Academic Council of Sree Vidyanikethan Engineering College (Autonomous) reserves the right to revise, amend, or change the Regulations, Schemes of Examinations, and/or Syllabi or any other policy/rule pertaining suitable to the needs of the society or industrial requirements without any prior notice.

13. General:

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

14. Academic Calendar

The duration for each semester shall be a minimum of 17 weeks of instruction.

I SEMESTER	**INSTRUCTION PERIOD**:	I Spell	:	9 Weeks	19 Weeks
		II Spell	:	8 Weeks	
	Internal Examinations :	I Mid	:	1 week	
		II Mid	:	1 week	
	Preparation & Practical Examinations				1 Week
	External Examinations				2 Weeks
	Semester Break				1 Week
II SEMESTER	**INSTRUCTION PERIOD**:	I Spell	:	9 Weeks	21 Weeks
		II Spell	:	8 Weeks	
	Industrial Visit/Seminar		:	2 Weeks	
	Internal Examinations :	I Mid	:	1 week	
		II Mid	:	1 week	
	Preparation & Practical Examinations				1 Week
	External Examinations				2 Weeks
	Summer Vacation				4 Weeks
III SEMESTER	Project Work Phase – I				18 Weeks
IV SEMESTER	Project Work Phase – II				18 Weeks

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

COURSE STRUCTURE (2011-2012)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

M.Tech. (COMPUTER SCIENCE)

I SEMESTER

Subject Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT10501	Computer Architecture	4	-	4	40	60	100
10MT10502	Discrete Structures and Automata Theory	4	-	4	40	60	100
10MT10503	Data Structures and Algorithms	4	-	4	40	60	100
10MT10504	Software Engineering	4	-	4	40	60	100
10MT10505	Database Management Systems	4	-	4	40	60	100
	Elective–I						
10MT10506	* Soft Computing						
10MT10507	* Computer Vision and Graphics						
10MT10508	* Digital Image Processing and Pattern Recognition	4	-	4	40	60	100
10MT10509	* Software Testing Methodologies						
10MT10510	Data Structures and Database Management Systems Lab		4	2	25	50	75
	TOTAL	**24**	**4**	**26**	**265**	**410**	**675**

II SEMESTER

Subject Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT20501	Computer Networks	4	-	4	40	60	100
10MT20502	Data Warehousing and Data mining	4	-	4	40	60	100
10MT20503	JAVA and Web Technologies	4	-	4	40	60	100
10MT20504	Object Oriented Analysis and Design	4	-	4	40	60	100
10MT20505	Operating Systems	4	-	4	40	60	100
10MT20506 10MT20507 10MT20508 10MT20509	**Elective–II** * Cloud Computing * Embedded Computing * Service Oriented Architecture * System Thinking	4	-	4	40	60	100
10MT20510	Industrial Visit / Seminar	-	-	2	50	-	50
10MT20511	Web Technologies and Object Oriented Analysis and Design Lab		4	2	25	50	75
	TOTAL	**24**	**4**	**28**	**315**	**410**	**725**

III SEMESTER

Subject Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT30501	Project Work Phase – I	-	-	4	50	-	50
	TOTAL			**4**	**50**	**-**	**50**

IV SEMESTER

Subject Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT40501	Project Work Phase – II	-	-	12	50	100	150
	Total			**12**	**50**	**100**	**150**

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10501) COMPUTER ARCHITECTURE

Unit I

Digital Logic Circuits and Components: Digital Computers - Logic gates - Boolean algebra - Map Simplifications Combinational Circuits: Half-Adder- Full-Adder- decoders- Encoders- Multiplexers Sequential Circuits: Flip flops- Registers- Shift Registers- Binary Counters - Memory Unit.

Unit II

Basic structure of Computers: Functional units - Basic operational concepts - Bus structures – Software- performance- multiprocessors and multi-computers. Data Types - Complements - Fixed Point Representation - Floating Point Representation - Error detection Codes.

Unit III

Register Transfer Language and Micro operations: Register Transfer language. Register Transfer Bus and memory transfers- Arithmetic Micro operations- logic micro operations- shift micro operations- Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle. Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

Unit IV

Data Path Design: Fixed Point Arithmetic- Addition- Subtraction- Multiplication and Division- Combinational and Sequential ALUs- Carry look ahead adder- Robertson algorithm- booth's algorithm- non-restoring division algorithm- Floating Point Arithmetic- Coprocessor- Pipeline Processing- Pipeline Design- Modified booth's Algorithm

Unit V

Control Design: Hardwired Control-Micro programmed Control-Multiplier Control Unit- CPU Control Unit- Pipeline Control- Instruction Pipelines- Pipeline Performance-Superscalar Processing-Nano Programming.

Unit VI

The Memory System: Basic concepts- semiconductor RAM memories. Read-only memories Cache memories- performance- Considerations- Virtual memories- secondary storage. Introduction to RAID.

Unit VII

Input-Output Organization: Peripheral Devices: Input-Output Interface- Asynchronous data transfer Modes of Transfer- Priority Interrupt Direct memory Access- Input –Output Processor (IOP) Serial communication; Introduction to peripheral component- Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232- USB- and IEEE1394.

Unit VIII

Multi Processors: Characteristics or Multiprocessors- Interconnection Structures- Inter processor Arbitration. Inter Processor Communication and Synchronization Cache Coherance - Shared Memory Multiprocessors.

TEXT BOOKS :

1. Carl Hamacher, Zvonks Vranesic, SafeaZaky, Computer Organization, Vth Edition, McGraw Hill.
2. M. Moris Mano, Computer Systems Architecture, Pearson/PHI, IIIrd Edition
3. John P. Hayes, Computer architecture and Organisation, Tata McGraw-Hill, Third Edition, 1998.

REFERENCES :

1. William Stallings, Computer Organization and Architecture , Pearson/PHI, Sixth Edition
2. Andrew S. Tanenbaum, Structured Computer Organization , PHI/Pearson, 4th Edition.
3. Sivaraama Dandamudi, Fundamentals or Computer Organization and Design - Springer Int. Edition.
4. Anjaneyulu, Computer Organization, Himalaya Pub house.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10502) DISCRETE STRUCTURES AND AUTOMATA THEORY

UNIT-I

Mathematical Logic: Statements and notations – Connectives - Well formed formulas - Truth Tables - Tautology - equivalence implication - Normal forms.

Predicates: Predicative logic - Free & Bound variables - Rules of inference – Consistency - proof of contradiction - Automatic Theorem Proving.

UNIT-II

Set Theory: Properties of binary Relations – equivalence - compatibility and partial ordering relations - Hasse diagram.

Functions: Inverse Function – Composite of functions - recursive Functions - Lattice and its Properties - Pigeon hole principles and its application.

Algebraic structures: Algebraic systems - Examples and general properties - Semi groups and monads - groups and sub groups - homomorphism - isomorphism.

UNIT-III

Elementary Combinatorics: Basis of counting - Combinations & Permutations with repetitions - Constrained repetitions - Binomial Coefficients - Binomial and Multinomial theorems - the principles of Inclusion – Exclusion.

Recurrence Relation: Generating Functions - Function of Sequences - Calculating Coefficient of generating function - Recurrence relations - Solving recurrence relation by substitution and Generating functions - Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT-IV

Graph Theory: Representation of Graph – DFS – BFS - Spanning Trees-planar Graphs - Graph Theory and Applications - Basic Concepts Isomorphism and subgraphs - Multi graphs and Euler circuits - Hamiltonian graphs - Chromatic Numbers.

UNIT-V

Fundamentals: Strings–Alphabet–Language – Operations - Finite state machine–definitions-finite automaton model - acceptance of strings and languages-deterministic finite automaton and non deterministic finite automaton - transition diagrams and Language recognizers.

Finite Automata: NFA with Î transitions – Significance - acceptance of languages. **Conversions and Equivalence:** Equivalence between NFA with and without Î transitions - NFA to DFA conversion - minimization of FSM - equivalence between two FSM's - Finite Automata with output-Moore and Melay machines.

UNIT -VI

Regular Languages: Regular sets - regular expressions - identity rules - Constructing finite Automata for a given regular expressions - Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets - closure properties of regular sets.

Grammar Formalism: Regular grammars-right linear and left linear grammars - equivalence between regular linear grammar and FA - inter conversion - Context free grammar - derivation trees - sentential forms. Right most and leftmost derivation of strings.

UNIT -VII

Context Free Grammars: Ambiguity in context free grammars - Minimization of Context Free Grammars - Chomsky normal form - Greiback normal form - Pumping Lemma for Context Free Languages - Enumeration of properties of CFL.

Push Down Automata: Push down automata–definition – model-acceptance of CFL - Acceptance by final state and acceptance by empty state and its equivalence - Equivalence of CFL and PDA - interconversion. (Proofs not required) - Introduction to DCFL and DPDA.

UNIT -VIII

Turing Machine: Turing Machine – definition – model - design of TM - Computable functions - recursively enumerable languages - Church's hypothesis - counter machine - types of Turing machines.

Computability Theory: Chomsky hierarchy of languages - linear bounded automata and context sensitive language - LR(0) grammar - decidability of problems - Universal Turing Machine - undecidability of posts - Correspondence problem - Turing reducibility- Definition of P and NP problems - NP complete and NP hard problems.

TEXT BOOKS:

1. Trembly J.P. & Manohar .P, Discrete Mathematical Structures with applications to computer science, TMH
2. John C Martin, Theory of Computation, TMH.

REFERENCES :

1. Ralph. P.Grimaldi, Discrete and Combinational Mathematics- An Applied Introduction-5th Edition, Pearson Education
2. Kenneth H. Rosen, Discrete Mathematics and its Applications, Fifth Edition, TMH.
3. Introduction to Theory of Computation –Sipser 2nd edition Thomson
4. Trembly J.P. & Manohar .P, Discrete Mathematical Structures with applications to computer science, TMH
5. Daniel I.A. Cohen, John Wiley, Introduction to Computer Theory.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10503) DATA STRUCTURES AND ALGORITHMS

UNIT I : Overview of Data Structures

Review of Arrays- Stacks- Queues- linked lists- Linked stacks and Linked queues- Applications

UNIT II: Algorithm Analysis

Efficiency of algorithms- Apriori Analysis- Asymptotic Notations- Time complexity of an algorithm using O notation- Polynomial Vs Exponential Algorithms- Average- Best- and Worst Case Complexities- Analyzing Recursive Programs.

UNIT III: Trees and Graphs

Introduction- Definition and Basic terminologies of trees and binary trees- Representation of trees and Binary trees- Binary tree Traversals- Threaded binary trees- Graphs-basic concepts- representation and traversals.

UNIT IV: Binary Search Trees, AVL Trees and B Trees

Introduction, Binary Search Trees: Definition- Operations and applications. AVL Trees: Definition- Operations and applications. B Trees: Definition- Operations and applications.

UNIT V: Red – Black Trees, Splay Trees and Hash Tables

Red – Black Trees- Splay Trees and its applications. Hash Tables: Introduction- Hash Tables- Hash Functions and its applications.

UNIT VI: Divide – and – Conquer & Greedy Method

General Method- Binary Search- Finding Maximum and Minimum- Quick Sort- Merge sort- Strassen's Matrix Multiplication- Greedy Method**-** General Method- Minimum Cost Spanning Trees- Single Source Shortest Path.

UNIT VII: Dynamic Programming

General Method- All Pairs Shortest Path- Single Source Shortest Path- 0/1 Knapsack problem- Reliability Design- Traveling Sales Person's Problem.

UNIT VIII: Back Tracking and Branch – and – Bound

General Method- 8 – Queen's Problem- Graph Coloring. Branch – and – Bound: The Method- LC Search- Control Abstraction- Bounding- 0 / 1 Knapsack Problem.

Text books:

1. G.A.V. Pai, Data Structures and Algorithms, TMH, 2009.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms, 2nd edition, University Press.

Reference books:

1. D. Samanta, Classic Data Structures, PHI, 2005.
2. Aho, Hopcraft, Ullman, Design and Analysis of Computer Algorithms PEA, 1998.
3. Goodman, Hedetniemi, Introduction to the Design and Analysis of Algorithms, TMG.
4. E. Horowitz, S. Sahani, Design and Analysis of Algorithms 3rd Edition, Galgotia.
5. Drozdek, Data Structures and Algorithms in C++, 2nd Edition, Thomson.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10504) SOFTWARE ENGINEERING

UNIT-I:

Software, Software Engineering, and Process: The nature of Software- The unique nature of WebApps- Software engineering- A layered technology- The essence and principles of software engineering practice- Generic process model (framework)- Process patterns- Process assessment and improvement- CMMI- Software myths.

UNIT-II:

Process Models: Prescriptive process models: The waterfall model- Incremental process models- Evolutionary process models.
The Unified process- Aspect oriented software development- Agile development: Agile process- Extreme programming.

UNIT-III:

Software Requirements : Introduction to functional and non-functional requirements- Requirements engineering activities- Eliciting requirements- *Requirements modeling*- Requirements validation- Software requirements specification(SRS)- Requirements management.

Requirements modeling: Structured view: Data modeling (ERD)- Functional modeling(DFD)- Behavioral modeling. Object oriented view: Use cases- CRC Modeling- Analysis classes- Collaborations- Responsibilities- Object relationship model- Object behavior model.
Software Project Estimation: Empirical estimation models.

UNIT-IV:

Design Concepts: Software design quality guidelines and attributes- Design concepts.

Software Architecture: Architecture and its importance- Architectural Styles- Data design- Architectural design.

Design: Structured view (Traditional view): Architectural mapping using data flow (Call and return architecture), Interface design, Function based component design.
Object oriented view: OO Architecture, Class hierarchies- Message design- Class based component design.

UNIT-V:
Performing User Interface Design: Golden rules- User interface analysis and design-interface analysis- interface design steps.

Pattern Based Design: Design patterns- Pattern based software design- Architectural patterns- Component level design patterns- User interface design patterns.

UNIT-VI:
Testing : Software testing strategies: A strategic approach to software testing- Test strategies (Unit testing and integration testing) for conventional and object oriented software- Validation testing- System testing- The art of debugging.

UNIT-VII:
Testing Conventional Applications: Software testing fundamentals- White-Box testing: basis path testing- condition (predicate) testing- data flow testing- loop testing- Black box testing: Equivalence partitioning- Boundary value analysis- Graph based testing methods.

Testing Object Oriented Applications: OO testing methods- Testing methods applicable at class level- Interclass test case design.

UNIT-VIII:
Umbrella Activities:
Risk management- Software quality assurance- Software configuration management- Measurement and metrics: Size oriented metrics- Function oriented metrics- Metrics for software quality- Product metrics: Metrics for the requirements model- Metrics for the design model- Metrics for source code- Metrics for testing- Metrics for maintenance.

Software Reengineering: A software reengineering process model- Software reengineering activities.

TEXT BOOKS:

1. Roger S. Pressman, Software Engineering, A practitioner's Approach, 7th edition, McGraw Hill International Edition.
2. Sommerville, Software Engineering, 7th edition, Pearson education.

REFERENCE BOOKS:

1. K.K. Agarwal & Yogesh Singh, Software Engineering, New Age International Publishers
2. James F. Peters, Witold Pedrycz, John Wiely, Software Engineering, an Engineering approach.
3. Shely Cashman Rosenblatt, Systems Analysis and Design, Thomson Publications.
4. Waman S Jawadekar, Software Engineering principles and practice, The TATA McGraw- Hill Companies.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10505) DATABASE MANAGEMENT SYSTEMS

UNIT I

Databases and Database Users – Database System Concepts and Architecture – Data Modeling Using the Entity- Relationship Model – The Enhanced Entity-Relationship Model.(Text Book 1: Chapters 1, 2, 3 & 4.1,4.2,4.3,4.4)

UNIT II

Database Design Theory and Methodology – Functional Dependencies and Normalization for Relational Databases - Relational Database Design and Algorithms and Further Dependencies. (Text Book 1: Chapters 10 & 11)

UNIT III

The Relational Data Model and Relational Database Constraints – Relational Algebra and Relational Calculus: Tuple Relational Calculus – Domain Relational Calculus- SQL-99-schema-definitons-constraints (Text Book 1: Chapters 5, 6 & 8)

UNIT IV

Introduction to SQL programming Techniques – Introduction to PL/SQL – More on PL/SQL – Database Objects: Stored Procedures and Functions – Advantages of Using a Procedure or Function – Procedure Versus Functions – Syntax for Creating, Deleting Stored Procedure and Functions (Text Book 1: Chapter 9; Text Book 2: Chapters 6, 7 & 9)

UNIT V

Disk Storage - Basic File Structures and Hashing – Indexing Structures for Files – Algorithms for Query Processing and Optimization. (Text Book 1: Chapters 13, 14 & 15).

UNIT VI

Introduction to Transaction Processing Concepts and Theory - Concurrent Control Techniques – Database recovery Techniques (Text Book 1: Chapters 17, 18 & 19).

UNIT VII

Distributed Database: An Overview – Levels of Distribution Transparency – Distributed Database Design – Translation of Global Queries to Fragment Queries (Text Book 3: Chapters 1, 3, 4 & 5)

UNIT VIII

Database Security – Concepts for Object Databases – Enhanced Data Models for Advanced Applications – Web Database Programming – Emerging Database Technologies and Applications. (Text Book 1: Chapter 23, 20, 24.1,24.4,24.3, 26 & 30)

Text Books:

1. Ramez Elmasri & Shamkant B. Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Education, 2008.
2. Ivan Bayross – SQL, PL/SQL Programming – 3rd revised edition, BPB publications.
3. Stefano Ceri, Giuseppe Pelagatti, Distributed Databases Principles and Systems, McGraw-Hill International Editions, 1985.

Reference books:

1. Thomas M. Connolly, Carolyn E. Begg, Database Systems – A Practical Approach to Design, Implementation and Management, Third edition, Pearson Education, 2003.
2. Jefrey D. Ullman, Jenifer Widom, A First Course in Database Systems, Pearson Education Asia, 2001.
3. Rajesh Narang, "Object Oriented Interfaces and Databases", Prentice Hall of India, 2002.
4. Abraham Silberchatz, Henry F. Korth, S.Sudarsan, Database System Concepts, Fifth Edition, McGraw-Hill, 2006.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10506) SOFT COMPUTING

Unit I:

NEURAL NETWORKS: Basic concepts-Supervised Learning Neural Networks – Perceptions - Adaline – Back propagation Multilayer Perceptrons – Radial Basis Function Networks

Unit II

ARTIFICIAL NEURALS: Unsupervised Learning Neural Networks – Competitive Learning Networks – Kohonen Self-Organizing Networks – Learning Vector Quantization – Hebbian Learning.

Unit III

FUZZY SET THEORY: Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems- Fuzzy decision making- Applications

Unit IV

FUZZY MODELS: Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

Unit V

OPTIMIZATION : Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing – Random Search – Downhill Simplex Search.

Unit VI

NEURO FUZZY MODELING: Adaptive Neuro-Fuzzy Inference Systems – Architecture – Hybrid Learning Algorithm – Learning Methods that Cross-fertilize ANFIS and RBFN – Coactive Neuro Fuzzy Modeling – Framework Neuron Functions for Adaptive Networks – Neuro Fuzzy Spectrum.

Unit VII

GENETIC ALGORITHM: Survival of the fittest-cross over mutation-reproduction-rank method-rank space method- Application.

Unit VIII

SOFT COMPUTING AND CONVENTIONAL AI : AI Search algorithm-Predicate calculus rules of interface - Semantic networks-frames-objects-Hybrid models- applications

TEXT BOOK

1. J.S.R.Jang, C.T.Sun and E.Mizutani, Neuro-Fuzzy and Soft Computing, PHI, 2004, Pearson Education 2004.

REFERENCES

1. Timothy J.Ross, Fuzzy Logic with Engineering Applications, McGraw-Hill, 1997.
2. Davis E.Goldberg, Genetic Algorithms: Search, Optimization and Machine Learning, Addison Wesley, N.Y., 1989.
3. S. Rajasekaran and G.A.V.Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI,
4. R.Eberhart, P.Simpson and R.Dobbins, Computational Intelligence - PC Tools, AP Professional, Boston, 1996.
5. Nih.J.Ndssen Artificial Intelligence, Harcourt Asia Ltd., Singapore, 1998.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10507) COMPUTER VISION AND GRAPHICS

UNIT-I

Cameras: Pinhole Cameras- Camera with Lenses- the Human Eye- Sensing. Radiometry-Measuring Light: Light in Space- Light at Surfaces- Important Special Cases.

UNIT-II

Sources- Shadows- and Shading: Qualitative Radiometry- Sources and Their Effects- Local Shading Models- Application: Photometric Stereo- Inter reflections: Global Shading Models.

UNIT-III

Linear Filters: Linear Filters and Convolution- Shift Invariant Linear Systems- Spatial Frequency and Fourier Transforms- Sampling and Aliasing- Filters as Templates- Technique: Normalized Correlation and Finding Patterns- Technique: Scale and Image Pyramids.

UNIT-IV

Edge Detection: Noise- Estimating Derivatives- Detecting Edges. Texture: Representing Texture- Analysis using Oriented Pyramids- and Application: Synthesizing Textures for Rendering- Shape for Texture for Planes.

UNIT-V

Basic raster graphics algorithms for drawing 2 D Primitives liner- circles- ellipses- arcs- clipping- clipping circles- ellipses & polygon.

UNIT-VI

Polygon Meshes in 3D- curves- cubic & surfaces- Solid modeling. Geometric Transformation: 2D- 3D transformations- window to viewport transformations- aromatic and color models.

UNIT-VII

Shading Tech: Transparency- Shadows- Object reflection- Gouraud & Phong shading techniques. Visible surface determination techniques for visible line determination- Z-buffer algorithm- scanline algorithm- algorithm for oct-tres- algorithm for curve surfaces- visible surfaces ray-tracing - recursive ray tracing- radio-city methods.

UNIT-VIII

Elementary filtering tech- elementary Image Processing techniques- Geometric & multi-pass transformation mechanisms for image storage & retrieval.

Text Books:

1. David A. Forsyth, Jean Ponce, Computer Vision-A Modern Approach, PHI, 2003.
2. Foley et. al., "Computer Graphics Principles & practice", AWL.
3. D. Hearn and P. Baker, "Computer Graphics", Prentice Hall, 1986.

References:

1. Geometric Computing With Clifford Algebras: Theoretical Foundations and Applications in Computer Vision and Robotics, Springer; 1 edition, 2001 by Sommer.
2. Sonka, Digital Image Processing and Computer Vision, 1/e.
3. Jack, Computer Vision and Applications: Concise Edition(With CD), Academy Press, 2000.
4. W. Newman and R. Sproul, "Principles of Interactive Computer Graphics, McGraw-Hill, 1973.
5. David F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill Book Company, 1985.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10508) DIGITAL IMAGE PROCESSING AND PATTERN RECOGNITION

UNIT I

Digital image fundamentals - Digital Image through scanner- digital camera - Concept of gray levels Gray level to binary image conversion - Sampling and quantization - Relation ship between pixels - Imaging Geometry.

UNIT II

Image Transforms 2-D FFT- Properties. Walsh transform - Hadamard Transform- Discrete cosine Transform - Haar transform - Slant transform - Hotelling transform.

UNIT III

Image enhancement Point processing - Histogram processing - Spatial filtering - Enhancement in frequency domain - Image smoothing - Image sharpening.

UNIT IV

Image Restoration Degradation model- Algebraic approach to restoration- Inverse filtering- Least mean square filters- Constrained Least Squares Restoration- Interactive Restoration.

UNIT V

Image segmentation Detection of discontinuities. Edge linking and boundary detection- Thresholding- Region oriented segmentation.

UNIT VI

Image compression Redundancies and their removal methods- Fidelity criteria- Image compression models- Source encoder and decoder- Error free compression- Lossy compression.

UNIT VII

Basics of pattern recognition- Bayesian decision theory- Classifiers- Discriminant functions- Decision surfaces- Normal density and discriminant functions- Discrete features

Unit VIII

Parameter estimation methods- Maximum-Likelihood estimation- Gaussian mixture models- Expectation-maximization method- Bayesian estimation

TEXT BOOK :

1. R.C. Gonzalez & R.E. Woods, Digital Image processing, Addison Wesley/ Pearson education, 2nd Education, 2002.
2. S. Theodoridis and K.Koutroumbas, Pattern Recognition, 4th Ed., Academic Press, 2009

REFERENCES :

1. A.K.Jain, Fundamentals of Digital Image processing – PHI.
2. Rafael C. Gonzalez, Richard E Woods and Steven L., Digital Image processing using MAT LAB, PEA, 2004.
3. William K. Pratt, John Wilely, Digital Image Processing, 3rd Edition, 2004.
4. Weeks Jr., SPIC/IEEE Series, Fundamentals of Electronic Image Processing – PHI.
5. R.O.Duda, P.E.Hart and D.G.Stork, Pattern Classification, John Wiley, 2001

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M.Tech. (CS)	L	P	C
I Semester	4	0	4

(10MT10509) SOFTWARE TESTING METHODOLOGIES

UNIT - I

Introduction: Purpose of testing- Dichotomies- model for testing- consequences of bugs- taxonomy of bugs

UNIT - II

Flow graphs and Path testing: Basics concepts of path testing- predicates- path predicates and achievable paths- path sensitizing- path instrumentation- application of path testing.

UNIT - III

Transaction Flow Testing : Transaction flows- transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing- strategies in dataflow testing- application of dataflow testing.

UNIT - IV

Domain Testing:-domains and paths- Nice & ugly domains- domain testing- domains and interfaces testing- domain and interface testing- domains and testability.

UNIT - V

Paths- Path products and Regular expressions: Path products & path expression- reduction procedure- applications- regular expressions & flow anomaly detection. Logic Based Testing: Overview- decision tables- path expressions- kv charts- specifications.

UNIT - VI

State- State Graphs and Transition testing: State graphs- good & bad state graphs- state testing- Testability tips.

UNIT - VII

Graph Matrices and Application: Motivational overview- matrix of graph- relations- power of a matrix- node reduction algorithm- building tools. (Student should be given an exposure to a tool like JMeter or Win-runner).

UNIT - VIII

Software Testing Tools Taxonomy of Testing tools- Methodology to evaluate automated testing tools- Load Runner- Win runner and Rational Testing Tools- Java Testing Tools- JMetra- JUNIT and Cactus.

TEXT BOOKS :

1. Boris Beizer, Software Testing techniques, second edition, Dreamtech.
2. Dr. K.V.K.K. Prasad, Software Testing Tools, Dreamtech.

REFERENCES :

1. Brian Marick, The craft of software testing, Pearson Education.
2. Software Testing Techniques – SPD (Oreille)
3. Edward Kit, Software Testing in the Real World, Pearson.
4. Perry, Effective methods of Software Testing, John Wiley.
5. Meyers, Art of Software Testing, John Wiley.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
I Semester	0	4	2

(10MT10510) DATA STRUCTURES AND DATABASE MANAGEMENT SYSTEMS LAB

Data Structures Lab Experiments:

1. Implementation of Stacks and Queues used linked list.
2. Perform the following operations using binary search tree:
   a) Insertion
   b) Deletion
   c) Searching
3. Perform the following operations on AVL-tree:
   a) Insertion
   b) Deletion
4. Implementing Knuth-Morris- Pratt pattern matching algorithm.
5. Implement the following using recursive and non-recursive traversals:
   a) Preorder
   b) Inorder
   c) Postorder.
6. Implement all the functions of a dictionary using hashing.
7. Implement a shortest path algorithm to find shortest path in a graph.
8. Implement 8-queen's problem.

Database Management Systems Lab Experiments:

1. Implement a student-college relationship using DDL commands and practice all possible DML commands.
2. Implement queries to demonstrate aggregate functions, GROUP BY, HAVING and creation / dropping of views.
3. a. Practice various JOIN operations on relations.
   b. Implement various normalizations on relations.
4. Implement the various trigger operations on relations.
5. Perform the following operations of procedures on relations
   a. Creation of stored procedure
   b. Execution of procedure
   c. Modification of procedure
6. Implement Database Objects and creation of object structures for complex relations.

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M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20501) COMPUTER NETWORKS

UNIT I

Foundation of Networking Protocols: 5-layer TCP/IP Model- 7-Layer OSI Model- Internet Protocols and Addressing- Equal-Sized Packets Model: ATM .**Review of Computer Networks and the Internet:** What is the Internet- The Network edge- The Network core- Access Networks and Physical media- ISPs and Internet Backbones- Delay and Loss in Packet-Switched Networks- History of Computer Networking and the Internet .

UNIT II

Networking Devices: Multiplexers- Modems and Internet Access Devices- Switching and Routing Devices- Router Structure. **The Link Layer and Local Area Networks:** Link Layer: Introduction and Services- Error-Detection and Error-Correction techniques- Multiple Access Protocols- Link Layer Addressing- Ethernet- Interconnections: Hubs and Switches- PPP: The Point-to-Point Protocol- Link Virtualization

UNIT III

Routing and Internetworking: Network–Layer Routing- Least-Cost-Path algorithms- Non-Least-Cost-Path algorithms- Intradomain Routing Protocols- Interdomain Routing Protocols- Congestion Control at Network Layer. **Logical Addressing:** IPv4 Addresses- IPv6 Addresses - **Internet Protocol:** Internetworking- IPv4- IPv6- Transition from IPv4 to IPv6 – **Multicasting Techniques and Protocols:** Basic Definitions and Techniques- Intradomain Multicast Protocols- Interdomain Multicast Protocols- Node-Level Multicast algorithms

UNIT IV

Transport and End-to-End Protocols: Transport Layer- Transport Services- Connection management- Transmission Control Protocol (TCP)- User Datagram Protocol (UDP)- Mobile Transport Protocols- TCP Congestion Control.

UNIT V

Application Layer: Principles of Network Applications- The Web and HTTP- File Transfer: FTP- Electronic Mail in the Internet- Domain Name System (DNS)- P2P File Sharing- Socket Programming with TCP and UDP- Building a Simple Web Server

UNIT VI

Wireless Networks and Mobile IP: Infrastructure of Wireless Networks- Wireless LAN Technologies- IEEE 802.11 Wireless Standard- Cellular Networks- Mobile IP- Wireless Mesh Networks (WMNs)

UNIT VII

Optical Networks and WDM Systems: Overview of Optical Networks- Basic Optical Networking Devices- Large-Scale Optical Switches- Optical Routers- Wavelength Allocation in Networks- Case Study: An All-Optical Switch

UNIT VIII

VPNs- Tunneling and Overlay Networks: Virtual Private Networks (VPNs)- Multiprotocol Label Switching (MPLS)- Overlay Networks – **VoIP and Multimedia Networking:** Overview of IP Telephony- VoIP Signaling Protocols- Real-Time Media Transport Protocols- Distributed Multimedia Networking- Stream Control Transmission Protocol

TEXT BOOKS:

1. James F. Kurose, Keith W.Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Third Edition, Pearson Education, 2007
2. Nader F. Mir, Computer and Communication Networks, Pearson Education, 2007

REFERENCE BOOKS:

1. Behrouz A. Forouzan, Data Communications and Networking, Fourth Edition, Tata McGraw Hill, 2007
2. Greg Tomsho,Ed Tittel, David Johnson, Guide to Networking Essentials, Fifth Edition, Thomson.
3. S.Keshav, An Engineering Approach to Computer Networking, Pearson Education.
4. Diane Teare, Catherine Paquet, Campus Network Design Fundamentals, Pearson Education (CISCO Press)
5. Andrew S. Tanenbaum, Computer Networks, Fourth Edition, Prentice Hall.
6. A.Farrel, The Internet and Its Protocols, Elsevier.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20502) DATA WAREHOUSING AND DATA MINING

UNIT-I:

Introduction : Data Mining- Kinds of Data- Data Mining Functionalities- Classification of Data Mining Systems- Primitives- Major Issues in Data Mining.

UNIT-II:

Data Preprocessing: Descriptive Data Summarization- Data Cleaning- Data Integration and Transformation- Data Reduction- Data Discretization and Concept Hierarchy Generation.

UNIT-III:

Data Warehouse and OLAP Technology: What is Data Warehouse- A Multidimensional Data Model- Data Warehouse Architecture- Data Warehouse Implementation- From Data Warehouse to Data Mining.

UNIT-IV:

Mining Frequent Patterns and Associations: Basic Concepts- Efficient and Scalable Frequent Itemset Mining Methods- Mining Various Kinds of Association Rules.

UNIT-V:

Classification and Prediction: Issues regarding classification and prediction- classification by decision tree induction- Bayesian classification- Rule based classification- Prediction- Accuracy and Error Measures.

UNIT-VI:

Cluster Analysis: Types of Data in Cluster Analysis- A Categorization of Major Clustering Methods- Partitioning Methods- Hierarchical Methods- Density based Methods- Grid based methods- model based clustering methods- Clustering high dimensional data- Outlier analysis.

UNIT-VII:

Mining Stream- Time-Series- and Sequence Data: Mining Data Streams- Mining Time-Series Data- Mining Sequence Patterns in Biological Data.

UNIT-VIII:

Mining Object- Spatial- Multimedia- Text and Web data: Multidimensional analysis and descriptive mining of complex data objects- Spatial Data Mining- Multimedia Data Mining- Text Mining- Mining the World Wide Web.

TEXT BOOKS:

1. Jiawei Han and Micheline Kamber, Data Mining, Concepts and Techniques, Elsevier, II Edition, 2008.

REFERENCE BOOKS:

1. Margaret H Dunham, Data Mining Introductory and Advanced Topics, Pearson Education, 2e, 2006.
2. Amitesh Sinha, Data Warehousing, Thomson Learning, 2007.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20503) JAVA AND WEB TECHNOLOGIES

Unit I

Object-Oriented concepts:

Classes and Objects – Methods - Constructors - Overloading Methods and constructors - Encapsulation - Inheritance - Data Abstraction - polymorphism –Abstract classes - Method Overloading - Method Overriding – Interfaces – Packages - Exception handling – try – catch - throw - throws and Finally - Multi Threading-Thread Life cycle - creating Threads.

Unit II

Applets - Event Handling - AWT Programming - Introduction to Swing – JApplet - Handling Swing Controls like Icons - Labels – Buttons – Text Boxes – Combo – Boxes – Tabbed Pane – Scroll Pane – Trees – Tables Differences between AWT Controls & Swing Controls Developing a Home page using Applet & Swing.

Unit III

HTML Common tags- List – Tables – Images – Forms – Frames - Cascading Style sheets - Introduction to Java Scripts - Objects in Java Script - Dynamic HTML with Java Script.

Unit IV

XML: Document Type Definition - XML Schemas - Document Object model - Presenting XML - Using XML Processors - DOM and SAX

Unit V

Java Beans: Introduction to Java Beans- Advantages of Java Beans- BDK Introspection- Using Bound properties- Bean Info Interface- Constrained properties Persistence- Customizes- Java Beans API.

Unit VI

Web servers- Tomcat Server Installation and Testing-Introduction to Servlets - Lifecycle of a Servlet – JSDK - The Servlet API-The javax.servlet Package-Reading Servlet parameters-Reading initialization parameters - The javax.servlet HTTP package-Handling Http Request & Responses-Using Cookies-Session Tracking-Security Issues.

Unit VII

Introduction to JSP: The Problem with Servlet - The Anatomy of a JSP Page - JSP Processing - JSP Application Design with MVC architecture - AJAX.

JSP Application Development: Generating Dynamic Content - Using Scripting Elements

Implicit JSP Objects - Conditional Processing – Displaying Values Using an Expression to Set an Attribute - Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages-Requests - and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

Unit VIII

Database Access: Database Access - Database Programming using JDBC Studying Javax.sql.* package - Accessing a Database from a JSP Page Application – Specific Database Actions - Deploying JAVA Beans in a JSP Page.

TEXT BOOKS:

1. Patrick Naughton and Herbert Schildt, The complete Reference Java 2 Fifth Edition , TMH.
2. Chris Bates, Web Programming, Building Internet Applications, 2nd Edition, WILEY Dreamtech
3. Dietel,Dietel and Nieto, Internet and World Wide Web-How To Program, PHI/Pearson Education.
4. Hans Bergsten, SPD O'Reilly, Java Server Pages

REFERENCE BOOKS:

1. John Duckett, Begining Web Programming, WROX.
2. Marty Hall and Larry Brown, Programming world wide web-Sebesta, Pearson Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES, Pearson.
3. Programming World Wide Web-Sebesta, Pearson.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20504) OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT I

Object Oriented concepts: The meaning of Object Orientation- object identity- Encapsulation- information hiding- polymorphism.

Introduction to UML: importance of modeling- principles of modeling- object oriented modeling- conceptual model of the UML- Architecture.

UNIT II

Basic Structural Modeling: Classes- Relationships- common Mechanisms- and diagrams.

Class & Object Diagrams: Terms- concepts- modeling techniques for Class & Object Diagrams.

UNIT III

Interaction Diagrams: Sequence Diagrams: Terms- Concepts and Common modeling techniques

Collaboration Diagrams: Terms- Concepts and Common modeling techniques

UNIT IV

Basic Behavioral Modeling: Use cases- Use case Diagrams- Activity Diagrams.

Advanced Behavioral Modeling: Events and signals- state machines- processes and Threads- time and space- state chart diagrams.

UNIT V

Architectural Modeling: Component- Deployment- Component diagrams and Deployment diagrams.

Case Studies: Automation of a Library- Software Simulator application (2-floor elevator simulator)

UNIT VI

The Unified process: use case driven- architecture centric- iterative- and incremental

The Four Ps: people- project- product- and process

Use case driven process: why use case- capturing use cases- analysis- design- and implementation to realize the use cases- testing the use cases

Architecture-centric process: architecture in brief- why we need architecture- use cases and architecture- the steps to architecture- an architecture description.
Iterative incremental process: iterative incremental in brief- why iterative incremental development? The iterative approach is risk driven- the generic iteration.

UNIT VII
Inception phase: early in the inception phase- the archetypal inception iteration workflow- execute the core workflows- requirements to test.
Elaboration Phase: elaboration phase in brief- early in the elaboration phase- the architectural elaboration iteration workflow- execute the core workflows-Requirements to test.

UNIT VIII
Construction phase: early in the construction phase- the archetypal construction iteration workflow- execute the core workflow.
Transition phase: early in the transition phase- activities in transition phase

TEXT BOOKS :

1. Grady Booch, James Rumbaugh, Ivar Jacobson, The Unified Modeling Language User Guide 2nd Edition, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, UML 2 Toolkit, David Fado WILEY-Dreamtech India Pvt. Ltd.
3. Ivar Jacobson, Grady Booch, James Rumbaugh, The Unified Software Development Process By, Pearson Education

REFERENCE BOOKS :

1. Meilir Page-Jones, Fundamentals of Object Oriented Design in UML, Pearson Education
2. Object Oriented Analysis & Design By Atul Kahate, The McGraw-Hill.
3. Mark Priestley, Practical Object-Oriented Design with UML, TATA McGrawHill
4. Brett D McLaughlin, Gary Pollice and David West, Object Oriented Analysis & Design, O'REILY .
5. Simon Bennet, Steve McRobb and Ray Farmer, Object-Oriented Analysis and Design using UML, 2nd Edition, TATA McGrawHill.
6. John W. Satzinger, Robert B Jackson and Stephen D Burd, Object-Oriented Analysis and Design with the Unified Process, THOMSON Course Technology.
7. R.C.Lee, and W.M.Tepfenhart, UML and C++, PHI.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20505) OPERATING SYSTEMS

Unit I

Operating Systems Introduction: What operating system do- structure- operations process management- memory management- storage management- distributed systems- special purpose systems. Operating system services- system calls- virtual machines- system design and implementation.

Unit II

Process and CPU Scheduling: Process concepts and scheduling- operations on processes- threads- and inter process communication- scheduling criteria- scheduling algorithms- multiple processor scheduling- thread scheduling.

Unit III

Memory Management and Virtual Memory: Logical versus physical address space- swapping- contiguous allocation- paging- segmentation- demand paging- performance of demanding paging- page replacement- page replacement algorithms- allocation of frames- thrashing.

Unit IV

File System Interface and Implementation: Access methods- directory structure- protection- file system structure- allocation methods- free-space management- directory management- directory implementation- efficiency and performance.

Deadlocks- System Model- dead locks characterization- methods for handling dead locks deadlock prevention- deadlock avoidance- deadlock detection- and recovery from deadlock.

Unit V

Process Management and Synchronization: The critical section problem- synchronization hardware- semaphores- and classical problems of synchronization- critical regions- monitors.

Unit VI

Case Study: The LINUX system: Design principles- kernel modules- process management- scheduling- memory management- file systems- inter process communication.

Unit VII

Introduction to Distributed systems: Goals of distributed system- hardware and software concepts- design issues.

Communication in Distributed systems: Layered protocols- ATM networks- the client server model- remote procedure call and group communication.

Unit VIII

Synchronization in distributed systems: Clock synchronization- mutual exclusion- Election algorithms- the Bully algorithm- a ring algorithm- atomic transactions.

Dead locks: Deadlock in distributed systems- distributed deadlock prevention- and distributed dead lock detection.

Text Books:

1. Abraham silberchatz, Peter B. Galvin, Greg Gagne, Operating system principles, 7th Edition, John Wiley.
2. Andrew. S. Tanenbaum, Distributed Operating System, PHI

Reference Books:

1. Crowley, Operating System A Design Approach, TMH.
2. Operating Systems – Internals and Design Principles, Stallings, Fifth Ediction, Pearson Education /PHI, 2005.
3. Andrew S Tanenbaum, Modern Operating Systems, 2nd edition, Pearson/PHI.
4. Dhamdhere, Operating Systems, TMH.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20506) CLOUD COMPUTING

Unit I

UNDERSTANDING CLOUD COMPUTING:

Virtualization: Definition, objectives, benefits of virtualized technology, The virtual service desk, How virtualization take place, Related forms of computing - Cloud Computing - Software As A Service – Grid Computing – Utility Computing – Virtualization processes, History of Cloud Computing, Cloud Architecture, Cloud Storage, Why Cloud Computing Matters, Advantages of Cloud Computing, Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services.

Unit II

DEVELOPING CLOUD SERVICES: Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service - Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

Unit III

BUILDING CLOUD NETWORKS: The Evolution from the MSP Model to Cloud - Computing and Software-as-a-Service -The Cloud Data Center - Collaboration - Service-Oriented Architectures as a Step -Toward Cloud Computing -Basic Approach to a Data Center-Based SOA - The Role of Open Source Software in Data Centers.

Unit IV

COMMON STANDARDS IN CLOUD COMPUTING: The Open Cloud Consortium - The Distributed Management Task Force - Open Virtualization Format - Standards for Application Developers - Browsers (Ajax) - Data (XML- JSON) - Solution Stacks (LAMP and LAPP) - Standards for Messaging - Standards for Security

Unit V

SECURITY IN THE CLOUD: Cloud Security Challenges - Software-as-a-Service Security - Security Management (People) - Security Governance - Risk Management - Risk Assessment - Security Portfolio Management - Security Awareness - Life Cycle (SecSDLC) - Security Monitoring and Incident - Forensics - Security Architecture Design - Application Security Virtual Machine Security.

Unit VI

CLOUD COMPUTING FOR EVERYONE: Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

Unit VII

USING CLOUD SERVICES: Collaborating on Calendars- Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

Unit VII

OTHER WAYS TO COLLABORATE ONLINE: Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

Text Books:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, Pearson, August 2011.
2. Cloud Computing Specialist Certification Kit – Virtualization, The Art of Service, http://www.theartofservice.com

References:

1. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.
2. Tim Mather, Subra Kumaraswamy, Shahed Latif, Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice), en | O'Reilly Media, Inc., 2009-09-12 18:32
3. Roger Jennings, Cloud Computing with the Windows Azure Platform (Wrox Programmer to Programmer), Wrox.
4. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, en | McGraw-Hill Osborne Media, 2009-11-20 19:08

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20507) EMBEDDED COMPUTING

UNIT I

Introduction to Embedded Systems: Embedded Systems- Processor Embedded into a System- Embedded Hardware Units and Devices in a System- Embedded Software- Complex System Design- Design Process in Embedded System- Formalization of System Design- Classification of Embedded Systems

UNIT II

8051 and Advanced Processor Architecture: 8051 Architecture- 8051 Micro controller Hardware- Input/Output Ports and Circuits- External Memory- Counter and Timers- Serial data Input/Output- Interrupts- Introduction to Advanced Architectures- Real World Interfacing- Processor and Memory Organization.

UNIT-III

Program Modeling Concepts: Program models- DFG models- State Machine program models- Modeling of multi processor system- UML modeling.

UNIT-IV

Embedded Programming Concepts: Software programming in Assembly language and High Level Language- Data types- Structures- Modifiers- Loops and Pointers- Macros and Functions- object oriented Programming- Embedded Programming in C++ & JAVA

UNIT-V

Device Drivers and Interrupt Service Mechanism: Programmed-I/O Busy-wait Approach without Interrupt Service Mechanism-ISR Concept-Interrupt sources-Interrupt Servicing mechanisms-Multiple interrupts-Context switching-periods-latency-DMA-Device driver programming.

UNIT VI

Introduction to IPC in Embedded Systems: Tasks-Task states-Task and data-Shared data-Inter process communication -Signal Function-Semaphore- Message Queues-Mail box-Pipe-Sockets-RPC.

UNIT VII

Real– Time Operating Systems: Real – Time Operating Systems-Basic Design Using an RTOS- Task Scheduling Models- Interrupt Latency- Response of Task as Performance Metrics - **RTOS Programming:** Basic functions and Types of RTOSES- RTOS VxWorks-Windows CE

UNIT V III

Embedded Software Development Process and Tools: Introduction to Embedded Software Development Process and Tools, Host and Target Machines, Linking and Locating Software, Getting Embedded Software into the Target System, Issues in Hardware-Software Design and Co-Design – **Testing - Simulation and Debugging Techniques and Tools:** Testing on Host Machine - Simulators - Laboratory Tools

Text Books

1. Rajkamal, Embedded Systems Architecture, Programming and Design, Tata McGraw Hill, First reprint, 2003.

REFERENCE

1. David E. Simon. An Embedded Software Primer, Pearson Education
2. John Catsoulis, Designing Embedded Hardware, O'reilly
3. Frank Vahid, Tony Givargis, Embedded System Design, John Wiley & Sons, Inc
4. Karim Yaghmour, Building Embedded Linux Systems, O'reilly

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20508) SERVICE ORIENTED ARCHITECTURE

UNIT I

SOA: Introducing SOA- Fundamental SOA- Why companies need SOA? Dimensions of SOA- Common tangible benefits of SOA- Common pitfalls of adopting SOA. The Evolution of SOA. A Preview of the Service-Oriented Architecture Compass.

UNIT II

Explaining the Business Value of SOA- Enterprise Reconstruction- Industry Deconstruction- Rethinking Components for Business and Applications. SOA Value roadmap. The Nine Business Rules of Thumb for SOAs.

UNIT III

Architectural Elements of SOA- Refining SOA Characteristics- Introduction to Strategy: Business Process Management (BPM) Enterprise Architecture- SOA and Web Services- Strategy of an SOA. Example of SOA as a Tactical Solution. Example of SOA as a Strategic Solution. Governance of Information Technology with an SOA Strategy. Program Management Methodology.

UNIT IV

Service-Oriented Architecture (SOA) Methodology: Introduction to Program Management Methodology- Framework of Governance- Communications- Product Realization- Project Management- Architecture- Data Management- Service Management- Human Resource Management- Post Implementation.

UNIT V

Deployment of Services- Integration of Process and Services: Architecture- and Restructuring of Organizations and Staff- Case Study: Broadband Communications Firm- Program Management Methodology: Overview- Methodology Frameworks and Key Factor Highlights on

Project- Governance- Communications- Product Realization- Project Management- Architecture- Data Management- Service Management- Human Resource Management- Post Implementation.

UNIT VI

Principles of Service-Orientation Service – Orientation and the enterprise-Anatomy of SOA-Common Principles of Service – Orientation-interrelation between Principles of Service-Orientation-Service Orientation and Object Orientation-Native Web Services support for Principles of Service-Orientation.

UNIT VII

Service Layers: Service-Orientation and Contemporary SOA - Service Layer abstraction - Application Service Layer - Business Service Layer-Orchestration Service Layer-Agnostic Services-Service Layer Configuration Scenarios.

UNIT VIII

Building SOA(Technology and Design)

Service Oriented Design(Part I-Introduction)-Introduction to Service-Oriented design-WSDL related XML Schema language basics-WSDL language basics-Service interface design tools. Service Oriented Design(Part II-SOA Composition Guidelines)-SOA Composing steps-Considerations for choosing service layers-Considerations for positioning core SOA standards-Considerations for choosing SOA extensions.

Text Books:

1. Norbert Bieberstein, Sanjay Bose,, Marc Fiammante, Keith Jones, Rawn Shah, Service-Oriented Architecture Compass: Business Value, Planning, and Enterprise Roadmap, IBM Press, © 2005.
2. James P Lawler, H. Howell-Barber, Service Oriented Architecture: SOA Strategy, Methodology and Technology, Auerbach Publications, Taylor & Francis Group, (C) 2008.
3. Thomas Erl, Service-Oriented Architecture-Concepts, Technology, and Design, Pearson Education.
4. Eric Newcomer, Greg Lomow, Understanding SOA with Web Services, Pearson Education.

Reference Books:

1. Jeff Davies & others, The Definitive guide to SOA, Apress, Dreamtech.
2. E.Hewitt, Java SOA Cook book, SPD.
3. N.M. Josuttis, SOA in Practice, SPD.
4. Applied SOA, Wiley India Pvt. Ltd.
5. J. Mc Govern, and others, Java Web Services Architecture, Morgan Kaufmann Publishers, Elsevier.
6. Shankar.K, SOA for Enterprise Applications, Wiley India Edition.
7. W.Roshen, SOA-Based Enterprise Integration, TMH.
8. K.Rama Rao, C.Prasad, SOA Security, dreamtech press.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
II Semester	4	0	4

(10MT20509) SYSTEM THINKING

UNIT I
Complexity in Real World
Complexity – Characteristics of complex problems

UNIT II
Learning
Learning in and about complex systems – Structure and Behavior of dynamic systems.

UNIT III
Systems thinking mindset
Holistic Thinking – Multi-levels of reasoning: Event-Pattern-Structure – Learning Organization

UNIT IV
Multi modeling approach
Multi-perspective: Stakeholder Needs, Alterables and Constraints

UNIT V
Problem solving approach
Problem Understanding: Discovery and Diagnosis.

UNIT VI
Tools for Systems Thinking
Causal Loop Diagram – Stocks and Flows – Dynamics of Simple Structures

UNIT VII
System Archetypes -1
Limits to Growth – Escalation – Drifting Goals

UNIT VIII
System Archetypes -2
Success to the Successful – Fixes that Fail– Shifting the Burden

Text Books

1. Senge, P.M. "The Fifth Discipline: The Art and Practice of Learning Organization", Doubleday, 1990.
2. Joseph O'Connor and Ian McDermott, "The Art of Systems Thinking", Thorsons, 1997.

References Books

1. John D. Sterman, "Business Dynamics: Systems Thinking and Modeling from Complex World", McGraw-Hill/Irwin, 2000.
2. Dennis Sherwood, "Seeing the Forest for the Trees: A Manager's Guide to Applying Systems Thinking", Nicholas Brealey, 2002.
3. MIT System Dynamics Group: http://sysdyn.clexchange.org/sd-intro/home.html

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CS)	L	P	C
II Semester	0	4	2

(10MT20511) WEB TECHNOLOGIES AND OBJECT ORIENTED ANALYSIS AND DESIGN LAB

Object Oriented Analysis and Design Lab Experiments:

Draw the UML diagrams for the following case studies:

1. ATM application
2. University course information system
3. Online ticket reservation system
4. Online shopping
5. Hospital Management System
6. Unified Library Application
7. Two-floor elevator simulator

Web Technologies Lab Experiments:

1. Design static web pages for an online book store website.
2. Write Java script to validate the fields of the registration page.
3. Design a web page using CSS.
4. Write a DTD (Document Type Definition) to validate an XML file.
5. Develop an application using Java Beans.
6. Develop a client-server application using servlets.
7. Develop JSP to connect to the database and experiment with various SQL queries.
8. Create an application using cookies and sessions.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE STRUCTURE (2011-2012)

M.Tech. (COMPUTER NETWORKS AND INFORMATION SECURITY)

I SEMESTER

Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT22504	Software Security Engineering	4	-	4	40	60	100
10MT10503	Data Structures and Algorithms	4	-	4	40	60	100
10MT16301	TCP/IP Protocols	4	-	4	40	60	100
10MT16302	Database Security and Privacy	4	-	4	40	60	100
10MT16303	Network Management Systems	4	-	4	40	60	100
10MT16304 10MT16305 10MT20502 10MT16306 10MT16307	**Elective-I** 1. Information Systems Control and Audit 2. Digital and Cyber Forensics 3. Data Warehousing and Data Mining 4. Performance Evaluation of Computer Networks 5. Parallel Processing	4	-	4	40	60	100
10MT16311	Computer Networks and Database Security Lab	-	4	2	25	50	75
	TOTAL	**24**	**4**	**26**	**265**	**410**	**675**

II SEMESTER

Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT20505	Operating Systems	4	-	4	40	60	100
10MT20506	Cloud Computing	4	-	4	40	60	100
10MT26301	Design of Secure Protocols	4	-	4	40	60	100
10MT26302	Intrusion Detection Systems	4	-	4	40	60	100
10MT26303	Wireless Networks	4	-	4	40	60	100
	Elective-II						
10MT22506	1. Information Retrieval Systems						
10MT26304	2. PKI – Trust Management	4	-	4	40	60	100
10MT26305	3. Trustworthy Computing						
10MT26306	4. Elliptic Curve Cryptosystems						
10MT26307	5. Network Programming						
10MT26311	Industrial Visit / Seminar	-	-	2	50	-	50
10MT26312	Wireless Networks and Cloud Computing Lab		4	2	25	50	75
	TOTAL	**24**	**4**	**28**	**315**	**410**	**725**

III SEMESTER

Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT36301	Seminar	-	-	4	50	-	50
	TOTAL			**4**	**50**	**-**	**50**

IV SEMESTER

Code	Subject	Periods per week		Credits	Scheme of Examination Max. Marks		
		L	P		Internal	External	Total
10MT46301	Project Work	-	-	12	50	100	150
	Total			**12**	**50**	**100**	**150**

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	L	P	C
I Semester	4	0	4

(10MT22504) SOFTWARE SECURITY ENGINEERING

UNIT I: SOFTWARE SECURITY ISSUE

Introduction, The problem, Software assurance and software security, Threats to software security, Sources of software insecurity, the benefits of detecting software security defects early, managing secure software development.

UNIT II: FEATURES OF SOFTWARE SECURITY

Defining properties of secure software, How to influence the security properties of software, feature of software security and specify desired security properties.

UNIT III: REQUIREMENTS ENGINEERING FOR SECURE SOFTWARE

The SQUARE process model: Identifying security requirements using the security quality requirements engineering (SQUARE) method, SQUARE sample outputs, Requirements elicitation, Requirements prioritization.

UNIT IV: SECURE SOFTWARE ARCHITECTURE AND DESIGN

Introduction, Software security practices for architecture and design: Architectural risk analysis. Software security knowledge for architecture and design: Security principles, Security guidelines, and Attack patterns.

UNIT V: CONSIDERATIONS FOR SECURE CODING AND TESTING

Introduction, Code analysis, Coding practices, Software security testing, Security testing considerations throughout the SDLC.

UNIT VI: SECURITY AND COMPLEXITY: SYSTEM ASSEMBLY CHALLENGES

Introduction, Security failures, Functional and attacker perspectives for security analysis, System complexity drivers and security.

UNIT VII: GOVERNANCE, AND MANAGING FOR MORE SECURE SOFTWARE

Governance and security, Adopting an enterprise software security framework, Security and project management.

UNIT VIII: SECURITY METRICS

Defining security metrics, Diagnosing problems and measuring technical security.

TEXT BOOKS:

1. Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, and Nancy R. Mead, *Software Security Engineering: A Guide for Project Managers*, Pearson Education (India), I ed., 2008.
2. Andrew Jaquith, *Security Metrics: Replacing Fear, Uncertainty, and Doubt*, Addison-Wesley, I ed., 2007.

REFERENCES BOOKS:

1. Gary McGraw, *Software Security: Building Security In*, Addison-Wesley, Kindle ed., 2006.
2. Mark Dowd, John McDonald, Justin Schuh, *The Art of Software Security Assessment: Identifying and Preventing Software Vulnerabilities*, Addison-Wesley, I ed., 2006.
3. John Viega, Gary McGraw, *Building Secure Software: How to Avoid Security Problems the Right Way*, Addison-Wesley, I ed., 2001
4. G. Hoglund, G. McGraw, *Exploiting Software: How to Break Code*, Addison-Wesley, I ed., 2004.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	L	P	C
I Semester	4	0	4

(10MT10503) DATA STRUCTURES AND ALGORITHMS

UNIT I : OVERVIEW OF DATA STRUCTURES

Review of Arrays, Stacks, Queues, Linked lists, Linked stacks and Linked queues, Applications.

UNIT II: ALGORITHM ANALYSIS

Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using O-notation, Polynomial Vs Exponential Algorithms, Average- Best- and Worst Case Complexities, Analyzing Recursive Programs.

UNIT III: TREES AND GRAPHS

Introduction, definition and basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded Binary trees, Graphs, basic concepts, representation and traversals.

UNIT IV: BINARY SEARCH TREES, AVL TREES AND B TREES

Introduction, Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.

UNIT V: RED – BLACK TREES, SPLAY TREES AND HASH TABLES

Red - Black Trees, Splay Trees and its applications. Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

UNIT VI: DIVIDE – AND – CONQUER & GREEDY METHOD

General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication, Greedy Method**,** General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT VII: DYNAMIC PROGRAMMING

General Method, All Pairs Shortest Path, Single Source Shortest Path, 0/1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

UNIT VIII: BACK TRACKING AND BRANCH – AND – BOUND

General Method, 8 - Queen's Problem, Graph Coloring. Branch and Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

TEXT BOOKS:

1. G.A.V. Pai, *Data Structures and Algorithms*, TMH, 2009.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, *Fundamentals of Computer Algorithms*, II ed.,2008 University Press.

REFERENCE BOOKS:

1. D. Samanta, *Classic Data Structures*, PHI, II ed., 2000.
2. Aho, Hopcraft, Ullman, *Design and Analysis of Computer Algorithms*, PEA, 1998.
3. Goodman, Hedetniemi, *Introduction to the Design and Analysis of Algorithms*, II ed., TMG, 1977.
4. E. Horowitz, S. Sahani, *Design and Analysis of Algorithms*, III ed., Galgotia, 1991.
5. Drozdek, *Data Structures and Algorithms in C++*, II ed., Thomson, 2008

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS) **L P C**
I Semester **4 0 4**

(10MT16301) TCP/IP PROTOCOLS

UNIT-I : **PROTOCOL STANDARDS AND ARCHITECTURAL MODELS**
Protocols and standards , standard organizations ,internet standards , administration , LANs, point-to-point WANs, switched WANs, connecting devices , the OSI model, layers in OSI model, TCP IP model, addressing ,IP versions.

UNIT-II: **IP ADDRESSING, ROUTING, ARP AND RARP**
Classful addressing, Other issues, Subnetting, Supernetting, Classless addressing, ARP(Address Resolution Protocol),ARP Package, RARP(Reverse Address Resolution Protocol).

UNIT-III: **NETWORK LAYER PROTOCOLS**
Internet protocol (IP) - datagram, fragmentation, options, checksum, ip package. Internet control message protocol (ICMP)- type, format, error reporting, query, checksum, ICMP package. Internet group management protocol (IGMP)-group management, messages, encapsulation, IGMP package.

UNIT-IV: **TRANSPORT LAYER PROTOCOLS**
User datagram protocol (UDP)- process-to-process communication, user datagram, checksum, UDP operation, use of UDP, package. Transmission control protocol(TCP) –TCP services, features, segment, connection, flow and error control, congestion control, TCP timers, options, TCP package. Stream control transmission protocol(SCTP)- services, features, packet format.

UNIT-V: **UNICAST AND ROUTING PROTOCOLS**
Intra-and- inter domain routing, distance vector routing, RIP(routing information protocol), link state routing, OSPF(open shortest path first) protocol, BGP(border gateway protocol),difference between unicast, multicast and broad cast, multicast applications, multicast routing, multicast link state routing (MOSPF), multicast distance vector(DVMRP).

UNIT-VI: **HOST CONFIGURATION AND DOMAIN NAME SYSTEM**
BOOTP (bootstrap protocol), DHCP (dynamic host configuration protocol), domain name system (DNS)- name space, domain name space, distribution of name space, DNSin the Internet, Resolution, DNS Messages, Types of Records, DDNS, Encapsulation.

UNIT –VII: **REMOTE LOGIN AND FILE TRANSFER**

TELNET (TErminal NETwork) – Concept, Network Virtual Terminal (NVT), NVT character set, Embedding, Options, Mode of operation, user Interface, File Transfer protocol (FTP), Trivial File Transfer Protocol (TFTP).

UNIT –VIII: **ELECTRONIC MAIL AND NETWORK MANAGEMENT PROTOCOLS**

Architecture, User Agent, Message transfer Agent, SMTP (Simple Mail Transfer Protocol), Message Access Agent, SNMP (Simple Network Management Protocol) – Concept, Management components, Structure of Management Information (SMI), Management Information Base (MIB), SNMP format. RTP (Real Time Transport Protocol). RTCP (Real Time Transport Control Protocol).

TEXTBOOK:

1. Behrouz A, *TCP/IP Protocol Suite*, Forouzan,III ed., TMH, 2005.

REFERENCE BOOKS:

1. Donglas E.Comer, *Internetworking with TCP/IP Principles, Protocols, and Architecture*, V ed., Pearson Education, 2006.
2. W. Richard Stevens, *TCP/IP Illustrated*, Perason Education,Volume 1, 2003.
3. James F. Kurose, Keith W. Ross, *Computer Networking – A Top-Down Approach Featuring the Internet*, V ed., Addison Wesley, 2009.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	L	P	C
I Semester	4	0	4

(10MT16302) DATABASE SECURITY AND PRIVACY

UNIT I: CONCEPTS OF SECURITY

Database Basics: Overview of Relational Model, SQL, Building of database, Manipulation of data. Goals of Database Security, access points of database security, database security levels, and menaces to databases.

UNIT II: SECURITY METHODS

Database security methods and methodologies, Security controls: flow control, inference control and access control Database Application Security models – Types of users, access matrix model, access modes model, commonly used application types. Classes of access control: Discretionary access control (DAC), Mandatory access control (MAC) and Role based Access control (RBAC).

UNIT III: A DISCRETIONARY ACCESS CONTROL (DAC) MECHANISMS

Capabilities, profiles, access control lists, passwords, and permission bits. RBAC based security models, features like User role assignment, Support for role relationships and constraints, Assignable privileges will be discussed.

UNIT IV: MAC BASED SECURITY MODELS

Discussions on access control policy decisions, discussions on beyond the control of the individual owner of an object, Information leakages through covert channels and inference channels, Security support in popular commercial database packages.

UNIT V: CASE STUDY: ORACLE

Oracle Security: Overview of Oracle Security and application contexts for security and performance, Implementing Fine Grained access controls with views, Virtual Private databases: need for VPDs, Implementing VPD using views.

UNIT VI: ROW LEVEL SECURITY

Implementing row level security, performance comparison of VPD with view based RLS, Oracle Label security.

UNIT VII: APPLICATIONS

Application Security, SQL Injection and Defensive programming Database, Intrusion Prevention.

UNIT VIII: DATA BASE AUDITING

Overview of database auditing, auditing environment, auditing process, auditing models, application of Auditing , Statistical database security, Database privacy – Hippocratic databases.

TEXT BOOKS:

1. Silvano Castano, Fugini, Martella, Samarati, *Database Security*, I ed., Addison Wesley, 1994 (Chapters 1, 3,4,and 5).
2. Ferrialso and Kuhn, *Research papers on RBAC* (first and recent- 2007 papers)

REFERENCE BOOKS:

1. Ron Ben Natan, *Implementing Database Security and Auditing*, Elsevier, Indian reprint 2006.
2. S. Castano, M.Fugini, G.Martella, P.Samarati (eds), *Database Security*, I ed., Addison- Wesley, 2001.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
I Semester	**4**	**0**	**4**

(10MT16303) NETWORK MANAGEMENT SYSTEMS

UNIT I: DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW

Analogy of Telephone Network Management, Communications Protocols and Standards, Case Histories on Networking and Management, Network Management Functions, Network and System Management.

UNIT II: BASIC FOUNDATIONS

Standards, Models, and Language, Network Management Standards, Network Management Models, Organization Model, Information Model, Communication Model, Functional Model, Network Management Applications, Abstract Syntax Notation One: ASN.1, Encoding Structure.

UNIT III: SNMPv1 NETWORK MANAGEMENT

History of SNMP Management, Internet Organizations and Standards, SNMP Model, Organization and Information Models, Communication and Functional Models.

UNIT IV: SNMPv2 NETWORK MANAGEMENT

SNMPv2, Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, SNMPv2 Management Information Base, SNMPv2 Protocol.

UNIT V: SNMPv3 NETWORK MANAGEMENT

SNMPv3, SNMPv3 Key Features, SNMPv3 Documentation Architecture, SNMPv3 Applications, SNMPv3 Management Information Base, SNMPv3 User-based Security Model, Access Control.

UNIT VI: MANAGEMENT TOOLS

RMON, Remote Monitoring, RMON SMI and MIB, RMON1, RMON2, A Case Study on Internet Traffic Network management tools, systems and engineering.

UNIT VII: TELECOMMUNICATIONS MANAGEMENT NETWORK

TMN Conceptual model, TMN standards, TMN Architecture, TMN implementation, Network Management Applications.

UNIT VIII: BROAD BAND NETWORK MANAGEMENT

WAN, Wired and optical access Networks, advanced management topics. Distributed Network Management, Reliable and Fault Tolerant Network Management.

TEXT BOOK:

1. Mani Subramanian, *Network Management: Principles and Practice*, II ed., Pearson Education, 2010.

REFERENCE Books:

1. William Stallings, *SNMP, SNMPv2, SNMPv3, AND RMON 1 and 2*, III ed., Addison- Wesley, 1999.
2. Morris, *Network Management*, Pearson Education, 2006.
3. Mark Burges, *Principles of Network System Administration*, II ed., Wiley Dreamtech,2008.
4. Paul, *Distributed Network Management*, John Wiley, 2000.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
I Semester	**4**	**0**	**4**

(10MT16304) INFORMATION SYSTEMS CONTROL AND AUDIT (ELECTIVE – I)

UNIT I: OVERVIEW OF COMPUTER SECURITY
Ethical Considerations, Threats to Security, Security Measures, Physical Protection system security and control: Hardware Security Controls , Software Controls, Encryption Techniques.

UNIT II: DATABASE SECURITY
Introduction to Databases ,Security Requirements of Databases, Designing Database Security, Methods of Protection ,Security of Multilevel Databases, Network and Telecommunication Security, Microcomputer Security .

UNIT III: VIRUSES
History of Viruses , Anatomy of Viruses ,Categories of Viruses and How They Work , How Viruses Spread ,Pseudo-Virus Programs , Motivation to Create Viruses, Known Viruses, Detection and Eradication ,Virus Protection Packages, International Perspective.

UNIT IV: LEGAL ISSUES AND CURRENT LEGISLATION
Defining Computer Crime, Methods of Computer Crime, Types of Crimes Committed, Software Violations, Software Piracy, Consultants and Outside Contractors, Crimes Against Computer Systems, Computer Crime Legislation, Privacy Considerations, Ethical Use of Computers.

UNIT V: MANAGERIAL ISSUES
Determination of Goals and Priorities ,Information Classification, Ownership, and Valuation, Locating and Training Computer Security Personnel, Budget Constraints, Security Training and Awareness ,Evaluating and Updating Security Programs, Disclosure of Security Violations ,Critical Management Issues in Computer Security.

UNIT VI: DISASTER RECOVERY AND CONTINGENCY PLANNING
Crisis Management, Risk Analysis ,Security Plan , Backup Procedures ,Insurance, Training of Employees ,Testing the Plan ,Scenarios of Actual Disasters, New Technologies and Future Trends .

UNIT VII: COMPUTER AUDITING

A Conceptual Foundation, EDP Concepts, Analytical Tools: Flowcharting and Decision Tables, Auditing Concepts, Internal Control structure: Organization Controls, Personnel Practices, and Standard Operating Procedures, Systems Development and Documentation Controls, Hardware and Systems Software Controls, System Security Controls, Data Capture and Batch Data Entry Controls, On-Line Entry, Processing, and Output Controls.

UNIT VIII: AUDITING EDP SYSTEMS

Auditing Computer Programs, Auditing Computer Files and Data Bases, Auditing Computer Processing: General Concepts, Auditing Computer Processing: User-Controlled Systems, Auditing Computer Processing: Third-Party Systems, Auditing Computer Processing: Expert Systems.

TEXT BOOK:

1. Karen A.Forcht, *Computer Security Management*, Boyd & Fraser Pub. Co., 1997.
2. Donald A.Watne,Peter B.B Turney, *Auditing EDP Systems*, II ed., Prentice Hall, 2002.

REFERENCE BOOK:

1. Ron Weber, *Information Systems Control and Audit*, I ed., Pearson, 2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
I Semester	**4**	**0**	**4**

(10MT16305) DIGITAL AND CYBER FORENSICS
(ELECTIVE – I)

UNIT- I: INTRODUCTION & EVIDENTIAL POTENTIAL OF DIGITAL DEVICES

Key developments, Digital devices in society, Technology and culture, Comment, Closed vs. open systems, evaluating digital evidence potential.

UNIT-II: DEVICE HANDLING & EXAMINATION PRINCIPLES

Seizure issues, Device identification, Networked devices, Contamination, Previewing, Imaging, Continuity and hashing, Evidence locations.

UNIT-III: EVIDENCE CREATION & EVIDENCE INTERPRETATION

A seven-element security model, A developmental model of digital systems, Knowing, Unknowing, Audit and logs, Data content, Data context.

UNIT- IV: INTERNET & MOBILE DEVICES

A little bit of history, The ISO/OSI model, The internet protocol suite, DNS, Internet applications, Mobile phones and PDAs, GPS, Other personal technology.

UNIT-V: COMPUTER FORENSICS FUNDAMENTALS

Introduction to Computer Forensics, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps Taken by Computer Forensics Specialists, Who Can Use Computer Forensic Evidence?, Case Histories, Case Studies.

UNIT-VI: TYPES OF COMPUTER FORENSICS TECHNOLOGY

Types of Military Computer Forensic Technology, Types of Law Enforcement: Computer Forensic Technology, Types of Business Computer Forensic Technology, Specialized Forensics Techniques, Hidden Data and How to Find It, Spyware and Adware, Encryption Methods and Vulnerabilities, Protecting Data from Being Compromised, Internet Tracing

Methods 65, Security and Wireless Technologies, Avoiding Pitfalls with Firewalls, Biometric Security Systems.

UNIT-VII: TYPES OF COMPUTER FORENSICS SYSTEMS

Internet Security Systems, Intrusion Detection Systems, Firewall Security Systems, Storage Area Network Security Systems, Network Disaster Recovery Systems, Public Key Infrastructure Systems, Wireless Network Security Systems, Satellite Encryption Security Systems, Instant Messaging (IM) Security Systems, Net Privacy Systems, Identity Management Security Systems, Identity Theft, Biometric Security Systems, Homeland Security Systems.

UNIT-VIII: VENDOR AND COMPUTER FORENSICS SERVICES

Occurrence of Cyber Crime, Cyber Detectives, Fighting Cyber Crime with Risk-Management Techniques, Computer Forensics Investigative Services, Forensic Process Improvement, Course Content, Case Histories.

TEXT BOOKS:

1. Angus M.Mashall, *Digital Forensics*, Wiley-Blackwell, I ed., A John Wiley & Sons Ltd Publication, 2009.
2. John R. Vacca, *Computer forensics: Computer Crime Scene Investigation*, II ed., Charles River Media, Inc. Boston, Massachusetts, 2005.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	L	P	C
I Semester	4	0	4

(10MT20502) DATA WAREHOUSING AND DATA MINING
(ELECTIVE – I)

UNIT-I: INTRODUCTION
Data Mining, Kinds of Data, Data Mining Functionalities, Classification of Data Mining Systems, Primitives, Major Issues in Data Mining.

UNIT-II: DATA PREPROCESSING
Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT-III: DATA WAREHOUSE AND OLAP TECHNOLOGY
Data Warehousing: A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehouse to Data Mining.

UNIT-IV: MINING FREQUENT PATTERNS AND ASSOCIATIONS
Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining Various Kinds of Association Rules.

UNIT-V: CLASSIFICATION AND PREDICTION
Issues regarding classification and prediction, classification by decision tree induction, Bayesian classification, Rule based classification, Prediction, Accuracy and Error Measures.

UNIT-VI: CLUSTER ANALYSIS
Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density based Methods, Grid based methods, model based clustering methods, Clustering high dimensional data, Outlier analysis.

UNIT-VII: MINING STREAM-TIME-SERIES- AND SEQUENCE DATA
Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Biological Data.

UNIT-VIII: MINING OBJECT-SPATIAL-MULTIMEDIA-TEXT AND WEB DATA

Multidimensional analysis and descriptive mining of complex data objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, *Data Mining, Concepts and Techniques*, II ed., Elsevier, 2008.

REFERENCE BOOKS:

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics*, II ed., Pearson Education, 2006.
2. Amitesh Sinha, *Data Warehousing*, I ed., Thomson Learning, 2007.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
I Semester	**4**	**0**	**4**

(10MT16306) PERFORMANCE EVALUATION OF COMPUTER NETWORKS

(ELECTIVE – I)

UNIT – I: PROBABILITY AND RANDOM VARIATES

Introduction, Axioms of Probability, Other Probability Relationships, Random variables cdf, pdf, pmf, Expected value and variance, Common Continuous RV, Flat RV, Gaussian RV, Exponential RV, Pareto RV, Common Discrete RVs, Discrete uniform RV, Bernoulli RV, Geometric RV, Binomial RV, Poisson RV, System with many Random Variables, Joint cdf and pdf, Individual pdf from a given joint pmf, Expected Value, Correlation, Variance Covariance, Transforming Random Variables, Generating Random Numbers.

UNIT – II: RANDOM PROCESSES

Introduction, Notation, Poisson Process, Exponential Process, Deterministic Process and non Deterministic Process, Ensemble Average, Time Average, Auto Correlation Function, Stationary Process, Cross Correlation Function, Covariance function, Correlation Matrix, Covariance Matrix.

UNIT – III: MARKOV CHAINS

Introduction, Markov Chains, Selection of the time step, Memory Less Property of Markov Chains, Markov Chain Transition Matrix, Markov Matrices, Eigen Values and Eigen Vectors of P Constructing the state Transition matrix P, Transient Behavior, Finding s(n), finding s(n) by expanding s(o), finding s(n) by Diagonalizing P, Expanding p^n in terms of its Eigen Vaules, Finding s(n) using Jordan Canonic form, Properties of Matrix V p^n expressed in JCF, Expressing p^n interms of its Eigen values, Markov Chains at Equilibrium, Finding Steady state Distribution Vectors, Techniques for Finding s, Finding s using Eigen vector Approach, Definition of Reducible Markov Chain Closed and Transient states, Transition Matrix of RMC, Periodic Markov Chain Definition, Types, Transition Matrix and Determinant.

UNIT – IV: QUEUING ANALYSIS

Introduction, Queue throughput, Traffic Conservation, M|M|1 queue, M|M|1|B queue, M^m|M|1|B queue, M|M^m|1|B queue, D|M|1|B queue, M|D|1|B queue, Systems of Communicating Markov Chains.

UNIT – V: MODELING MEDIUM ACCESS CONTROL PROTOCOLS

Introduction, IEEE Standard 802.1p: Static Priority Protocol, ALOHA, Slotted ALOHA, IEEE Standard 802.3 (CSMA/CD), CSMA/CA, IEEE 802.11: DCF Function for Ad hoc Wireless LAN, PCF Function, QoS.

UNIT – VI: MODELING ERROR CONTROL PROTOCOLS

Introduction, Stop and Wait ARQ Protocol, SWARQ Performance, Go Back – N Protocol, GBNARQ Performance, Selective Repeat Protocol, SRARQ Performance.

UNIT – VII: MODELING NETWORK TRAFFIC

Introduction, Flow Traffic Models, Continuous time Modeling, Discreate time modeling, Self Similar Traffic, Self Similar Traffic and Random Process, Heavy Tailed Distribution, Pareto Traffic Distribution, Packet Length Statistics, Packet Transmission Error Description.

UNIT – VIII: MODELING TRAFFIC FLOW CONTROL PROTOCOLS

Introduction, Leaky Bucket Algorithm, LB Performance Token Bucket Algorithms, TB Performance, Virtual Scheduling Algorithm Vs Protocol Performance.

TEXT BOOK:

1. Fayez Gebali, *Analysis of Computer and Communication Networks*, I ed., Springer, 2008.

REFERENCE BOOKS:

1. W. Stallings, High Speed Networks and Internets, *Performance and Quality of Service*, II ed., Prentice Hall, 2002.
2. Wah Chun Chan, *Performance Analysis of Telecommunications and Local Area Networks*, I ed., Kluwer, 2000.
3. G.N. Higginbottom, *Performance Evaluation of Communication Networks*, Artech House, 1998.
4. P.G. Harrison, N.M. Patel, *Performance Modeling of Communication Networks and Computer Architectures*, Addison Wesley, 1993.
5. G.N. Higginbottom, *Performance Evaluation of Communication Networks*, Artech House, 1998.
6. C.H. Sauer and K.M. Chandy, *Computer Systems Performance Modeling*, Prentice Hall, 1981.
7. Raj Jain, *The Art of Computer System Performance Analysis*, II ed., John Wiley, 1991.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
I Semester	**4**	**0**	**4**

(10MT16307) PARALLEL PROCESSING
(ELECTIVE – I)

UNIT-I: INTRODUCTION, MOTIVATION FOR PARALLELISM

Parallel Computing, Speed Up, Moore's Law, Grand Challenge Problems, Trends.

Parallel and Distributed Computers: Flynn's Taxonomy, Distributed Memory Multicomputers, Shared Memory Multiprocessors, Networks of Workstations, Cluster and Grid Computing.

UNIT- II: MESSAGE PASSING

Process Creation, Message Passing Routines, Point-to-Point, Collective Communication.

MPI and PVM: MPI Model of Computation, Basic Concepts, Message Passing Routines, Point-to-Point, Collective Communication, Comparison of MPI and PVM.

UNIT- III: PERFORMANCE MEASURES

Granularity, Speed Up, Efficiency, Cost, Amdahl's Law, Gustafson's Law, Isoefficiency.

Analysis of Parallel Programs: Parallel Computation Models, PRAM, Modeling Communication, Cluster Cost Model.

UNIT- IV: PARALLEL PROGRAMMING TECHNIQUES

Introduction, Embarrassingly Parallel Computations: Low Level Image Processing, Mandelbrot Set, Monte Carlo Methods.

Simple Data Partitioning: Sum of Numbers, Bucket Sort, Numerical Integration, N-Body Problem.

Divide-and-Conquer: Sum of Numbers, Merge Sort, Adaptive Quadrature, Barnes-Hut Algorithm.

UNIT- V: PIPELINED COMPUTATIONS

Type 1, 2 and 3 Pipelines, Sum of Sequence, Insertion Sort, Prime Number Generation, Back Substitution.

Scheduling and Load Balancing: List Scheduling, Static Load Balancing, Dynamic Load Balancing, Moore's Algorithm.

UNIT- VI: SYNCHRONOUS COMPUTATIONS

Data Parallel Programming, Global and Local Synchronization, Solving Linear Equations, Cellular Automata.

Shared Memory Programming: Threads, Compiler Directives, OpenMP.

UNIT- VII: APPLICATIONS

Sorting Algorithms: Rank Sort, Compare and Exchange, Bubble Sort, Quick sort, Bitonic Merge sort.

Numerical Algorithms: Matrix Algorithms, Solving Linear Equations, Gaussian Elimination; Jacobi Iteration.

UNIT-VIII: FOURIER TRANSFORMS

Serial Algorithm, Binary Exchange Algorithm, Transpose Algorithm.

TEXT BOOK:

1. Barry Wilkinson and Michael Allen, *Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers*, II ed., Prentice Hall, 2005.

REFERENCE BOOKS:

1. A. Grama, A. Gupta, G. Karypis and V. Kumar, *Introduction to Parallel Computing*,
   II ed., Addison Wesley, 2002.
2. H. El-Rewini and T.G. Lewis, *Distributed and Parallel Computing, Manning*, 1997.
3. I. Foster, *Designing and Building Parallel Programs*, I ed., Addison Wesley, 1995.
4. Kai Hwang and Zhiwei Xu, *Scalable Parallel Computing*, McGraw Hill, 1998.
5. Michael J. Quinn, *Parallel Programming in C with MPI and Open MP*, McGraw Hill, 2004.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
I Semester	**0**	**4**	**2**

(10MT16311) COMPUTER NETWORK AND DATABASE SECURITY LAB

1. Implementation of granting privileges through DCL.
2. Multilevel security.
3. Statistical Database Inference Protection Techniques.
4. Database security plan development.
5. Client Server using Pipes ,FiFos Message queues, Sharad Memory.
6. Connection oriented client server with TCP – connection less, client server with UDP – concurrent server.

6. a. Practicals using various switches.

7. Multi- Protocol Server- Internet Super Server- Chat Server- Mail Server.
8. Advanced socket I/O- function- asynchronous I/O- passing file descriptions- Routing Algorithm using different type of routers.

8 a. Practicals based on optical switch.

9. IP Spoofing, IP Tunneling.

10 Fire Wall Implementation.

11. Password Authentication and Protection.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**4**	**0**	**4**

(10MT20505) OPERATING SYSTEMS

UNIT-I: OPERATING SYSTEMS INTRODUCTION

What operating system do- structure- operations process management- memory management- storage management- distributed systems- special purpose systems. Operating system services- system calls- virtual machines- system design and implementation.

UNIT-II: PROCESS AND CPU SCHEDULING

Process concepts and scheduling- operations on processes- threads- and inter process communication- scheduling criteria- scheduling algorithms- multiple processor scheduling- thread scheduling.

UNIT-III: MEMORY MANAGEMENT AND VIRTUAL MEMORY

Logical versus physical address space- swapping- contiguous allocation- paging- segmentation- demand paging- performance of demanding paging- page replacement- page replacement algorithms- allocation of frames- thrashing.

UNIT-IV: FILE SYSTEM INTERFACE AND IMPLEMENTATION

Access methods- directory structure- protection- file system structure- allocation methods- free-space management- directory management- directory implementation- efficiency and performance.

Deadlocks-System Model- dead locks characterization- methods for handling dead locks deadlock prevention- deadlock avoidance- deadlock detection- and recovery from deadlock.

UNIT-V: PROCESS MANAGEMENT AND SYNCHRONIZATION

The critical section problem- synchronization hardware- semaphores- and classical problems of synchronization- critical regions- monitors.

UNIT-VI: CASE STUDY

The LINUX system: Design principles- kernel modules- process management- scheduling- memory management- file systems- inter process communication.

UNIT-VII: INTRODUCTION TO DISTRIBUTED SYSTEMS

Goals of distributed system- hardware and software concepts- design issues.

Communication in Distributed systems: Layered protocols- ATM networks- the client server model- remote procedure call and group communication.

UNIT VIII: SYNCHRONIZATION IN DISTRIBUTED SYSTEMS

Clock synchronization- mutual exclusion- Election algorithms- the Bully algorithm- a ring algorithm- atomic transactions.

Dead locks: Deadlock in distributed systems- distributed deadlock prevention- and distributed dead lock detection.

TEXT BOOKS:

1. Abraham silberchatz, Peter B. Galvin, Greg Gagne, *Operating System Principles*,
   VII ed., John Wiley.
2. Andrew. S. Tanenbaum, *Distributed Operating System*, PHI, 2011.

REFERENCE BOOKS:

1. Crowley, *Operating System A Design Approach*, I ed., TMH.
2. Stallings, *Operating Systems – Internals and Design Principles*, V ed., Pearson Education /PHI, 2005.
3. Andrew S Tanenbaum, *Modern Operating Systems*, II ed., Pearson/PHI.
4. Dhamdhere, *Operating Systems*, II ed., TMH.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

M.Tech. (CN&IS)	L	P	C
II Semester	4	0	4

(10MT20506) CLOUD COMPUTING

Unit I

UNDERSTANDING CLOUD COMPUTING:

Virtualization: Definition, objectives, benefits of virtualized technology, The virtual service desk, How virtualization take place, Related forms of computing - Cloud Computing - Software As A Service – Grid Computing – Utility Computing – Virtualization processes, History of Cloud Computing, Cloud Architecture, Cloud Storage, Why Cloud Computing Matters, Advantages of Cloud Computing, Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services.

Unit II

DEVELOPING CLOUD SERVICES: Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service - Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

Unit III

BUILDING CLOUD NETWORKS: The Evolution from the MSP Model to Cloud - Computing and Software-as-a-Service -The Cloud Data Center - Collaboration - Service-Oriented Architectures as a Step -Toward Cloud Computing -Basic Approach to a Data Center-Based SOA - The Role of Open Source Software in Data Centers.

Unit IV

COMMON STANDARDS IN CLOUD COMPUTING: The Open Cloud Consortium - The Distributed Management Task Force - Open Virtualization Format - Standards for Application Developers - Browsers (Ajax) - Data (XML- JSON) - Solution Stacks (LAMP and LAPP) - Standards for Messaging - Standards for Security

Unit V

SECURITY IN THE CLOUD: Cloud Security Challenges - Software-as-a-Service Security - Security Management (People) - Security Governance - Risk Management - Risk Assessment - Security Portfolio Management - Security Awareness - Life Cycle (SecSDLC) - Security Monitoring and Incident - Forensics - Security Architecture Design - Application Security Virtual Machine Security.

Unit VI

CLOUD COMPUTING FOR EVERYONE: Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

Unit VII

USING CLOUD SERVICES: Collaborating on Calendars- Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

Unit VII

OTHER WAYS TO COLLABORATE ONLINE: Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis.

Text Books:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, Pearson, August 2011.

2. Cloud Computing Specialist Certification Kit – Virtualization, The Art of Service, http://www.theartofservice.com

References:

1. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

2. Tim Mather, Subra Kumaraswamy, Shahed Latif, Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice), en | O'Reilly Media, Inc., 2009-09-12 18:32

3. Roger Jennings, Cloud Computing with the Windows Azure Platform (Wrox Programmer to Programmer), Wrox.

4. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, en | McGraw-Hill Osborne Media, 2009-11-20 19:08

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS) **L P C**
II Semester **4 0 4**

(10MT26301) DESIGN OF SECURE PROTOCOLS

UNIT-I: INTRODUCTION TO MODERN CRYPTOGRAPHY
Encryption: Historical Glance, Modern Encryption: A Computational Complexity Based Theory, A Short List of Candidate One Way Functions, Security Dentitions, The Model of.

UNIT-II: PSEUDO-RANDOM BIT GENERATORS
Generating Truly Random bit Sequences, Generating Pseudo-Random Bit or Number Sequences, Provably Secure Pseudo-Random Generators; The Existence Of A Pseudo-Random Generator, Next Bit Tests, Blum/Blum/Shub Pseudo-Random Generator.

UNIT-III: BLOCK CIPHERS
Data Encryption Standard (DES), Key recovery attacks on block ciphers, Iterated-DES and DESX, Double-DES, Triple-DES, Advanced Encryption Standard (AES), Limitations of key-recovery based security.

UNIT-IV: PSEUDO-RANDOM FUNCTIONS
Function families, Random functions and permutations, Random functions, Random permutations, Pseudorandom functions, Pseudorandom, PRP under CPA , PRP under, Relations, Modeling block ciphers, Example Attacks, Security against key recovery, The birthday attack, The PRP/PRF switching lemma, Sequences of families of PRFs and PRPs Some applications of PRFs .

UNIT-V: PRIVATE-KEY ENCRYPTION
Symmetric encryption schemes, The one-time-pad encryption scheme, Issues in privacy, Indistinguishability under chosen-plaintext attack, Example chosen-plaintext attacks, Attack on ECB, Attack on CBC encryption with counter IV, IND-CPA implies PR-CPA, Security of CTR modes, Security of CBC with a random, Indistinguishability under chosen-ciphertext attack.

UNIT-VI: PUBLIC-KEY ENCRYPTION

Definition, Simple Examples of PKC: The Trapdoor Function Model, Problems with the Trapdoor Function Model, Problems with Deterministic Encryption in Genera; The RSA Cryptosystem, Rabin's Public key Cryptosystem, Knapsacks, Definition of Security: Polynomial, Semantic security, Probabilistic Public Key Encryption, Encrypting Single Bits: Trapdoor Predicates, Hard Core, An implementation of EPE with cost equal to the cost of RSA, Practical RSA based encryption.

UNIT-VII: HASH FUNCTIONS

The hash function, Collision-resistant hash functions, Collision-finding attacks, One-wayness of collision-resistant hash functions, The MD transform, Collision-resistance under hidden-key attack .

UNIT-VIII: MESSAGE AUTHENTICATION

Definition of security for MACs , The PRF-as-a-MAC paradigm, The CBC MACs, Birthday attack on the CBC, MACing with cryptographic hash functions, The HMAC construction, Security of HMAC, Universal hash based MACs.

TEXT BOOKS:

1. O. Goldrich, *Foundations of Cryptography Vol. 1 and Vol. 2,* Cambridge University Press, 2001.
2. H. Delfs and H. Knebl, *Introduction to Cryptography – Principles and Applications*, Springer, 2002.

REFERENCE BOOKS:

1. Goldwasser S and M. Bellare, *Lecture Notes in Cryptography*, July 2008.
2. N. Koblitz, *A Course in Number Theory and Cryptography*, II ed., Springer-Verlag, 2003.
3. A. Menezes, P.C. van Oorschot, S.A. Vanstone, *Handbook of Applied Cryptography*, CRC Press, 1996.
4. Catalano, D., Cramer, R., Damgard, I., Di Crescenzo, G., Pointcheval, D., Takagi, T., *Contemporary Cryptology*, Birkhauser, 2005.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS) **L P C**
II Semester **4 0 4**

(10MT26302) INTRUSION DETECTION SYSTEMS

UNIT I: DETECTING AND CONTROLLING INTRUSIONS
Network Security Monitoring Revisited, Defensible Network Architecture,

UNIT II: EXTRUSION DETECTION SYSTEM
Extrusion Detection Illustrated, Enterprise Network Instrumentation, Layer 3 Network Access Control.

UNIT III: NETWORK SECURITY OPERATIONS
Traffic Threat Assessment, Network Incident Response, Network Forensics.

UNIT IV: INTERNAL INTRUSIONS
Traffic Threat Assessment Case Study, Malicious Bots.

UNIT V: INTRUSION PREVENTION OVERVIEW
Intrusion Prevention Overview, Signatures and Actions, Operational Tasks, Security in Depth.

UNIT VI: HOST INTRUSION PREVENTION
Host Intrusion Prevention Overview, HIPS Components.

UNIT VII: NETWORK INTRUSION PREVENTION
Network Intrusion Prevention Overview, NIPS Components.

UNIT VIII: DEPLOYMENT SOLUTIONS
Cisco Security Agent Deployment, Deploying Cisco Network IPS, Deployment Scenarios

TEXT BOOKS:
1. Richard Bejtlich, *Extrusion Detection: Security Monitoring for Internal Intrusions*, Pearson Education, 2004.
2. Earl Carter, Jonathan Hogue, *Intrusion Prevention Fundamentals*, Pearson Education, 2002.

REFERENCE BOOKS:
1. Christopher Kruegel, Fredrik Valeur, Giovanni Vigna, *Intrusion Detection and Correlation Challenges and Solutions*, Springer, 2005.
2. Carl Endorf, Eugene Schultz and Jim Mellander, *Intrusion Detection & Prevention*, McGraw-Hill, 2004.
3. Stephen Northcutt, Judy Novak, *Network Intrusion Detection*, New Riders Publishing, III ed., 2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**4**	**0**	**4**

(10MT26303) WIRELESS NETWORKS

UNIT-I: INTRODUCTION

History of Cellular Systems, Characteristics, Fundamentals, Cellular System Infrastructure, Satellite Systems, Network Protocols, Ad Hoc Networks, Sensor Networks, Wireless LANs, MANs and PANs Recent Advances.

UNIT-II: MOBILE RADIO PROPAGATION AND CHANNEL CODING

Introduction, Types of Radio Waves, Propagation Mechanism, Free Space Propagation, Land Propagation, Path loss, Slow fading, Fast fading, Doppler effect, Delay Spread, Inter Symbol Interference, Coherence Bandwidth, Co channel Interference, Linear Block Codes, Cyclic Codes, Cyclic Redundancy Check (CRC), Convolutional Codes, Inter leaver, Turbo codes, ARQ Techniques.

UNIT-III: CELLUAR CONCEPT AND MULTIPLE DIVISION TECHNIQUES:

Introduction, Cell area, Signal Strength and Cell Parameters, Capacity of a Cell, Frequency Re use, Formation of a Cluster, Cell Splitting, Cell Sectoring.

MULTIPLE DIVISION TECHNIQUES: Concepts and Models for Multiple Divisions: FDMA, TDMA, CDMA, OFDM, SDMA, Comparison of Multiple Division Techniques. Modulation Techniques: AM, FM, FSK, PSK, ∏/4 PSK, QAM, 16 AQM.

UNIT-IV: MULTIPLE RADIO ACCESS AND TRAFFIC CHANNEL ALLOCATION

Multiple Radio Access Protocols, Contention based Protocol, Static Allocation Versus Dynamic Allocation, Fixed Channel Allocation, Dynamic Channel Allocation, Hybrid Channel Allocation, Allocation in Specialized Structure, System Modeling.

UNIT-V: NETWORK PROTOCOLS

Introduction, TCP/IP/Protocol, TCP over Wireless Internet Protocol Version 6(IPV6).

UNIT-VI: MOBILE COMMUNICATION SYSTEMS AND EXISTING WIRELESS SYSTEMS

Introduction, Cellular Infrastructure, Registration, Handoff Parameters and Under Laying Support, Roaming Support, Multicasting, Security and Privacy, Firewalls and System Security.

EXISTING WIRELESS SYSTEMS: AMPS, IS-41, GSM, PCS, IS-95, IMT-2000.

UNIT-VII: AD HOC NETWORKS

Introduction, Characteristics of MANETS, Applications, Routing, Table driven Routing Protocols, Source-initiated Protocols, Hybrid Protocols, VANET, Security Issues in MANETS.

UNIT-VIII: SENSOR NETWORKS

Introduction, Fixed Wireless Sensor Networks, Wireless Sensor Networks, Sensor Deployment, Network Characteristics, Design Issues in Sensor Networks, Secured Communication.

TEXT BOOK:

1. Darma. P.Agarwal and Qing-An Zeng, *Introduction to Wireless and Mobile Systems*, III ed., CENGAGE Learning.

REFERENCE BOOKS:

1. William Stallings, *Wireless communications and Networks*, Pearson education, 2005.
2. Theodore S. Rappaport, *Wireless Communications–Principles and Practice*, II ed., PHI, 2002.
3. Jim Geier, *Wireless Networks First-Step*, Pearson education, 2005.
4. Sumit Kaseraetal, *2.5G Mobile Networks*: GPRS and EDGE, Tata McGraw Hill, 2008.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	L	P	C
II Semester	4	0	4

(10MT22506) INFORMATION RETRIEVAL SYSTEMS
(ELECTIVE – II)

UNIT-I
INTRODUCTION: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

UNIT-II
INFORMATION RETRIEVAL SYSTEM CAPABILITIES: Search, Browse, Miscellaneous

UNIT-III
CATALOGING AND INDEXING: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

UNIT-IV
DATA STRUCTURES: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT-V
AUTOMATIC INDEXING: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

UNIT-VI
DOCUMENT AND TERM CLUSTERING: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-VII
USER SEARCH TECHNIQUES: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext.
Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-VIII

TEXT SEARCH ALGORITHMS: Introduction, Software text search algorithms, Hardware text search systems.

INFORMATION SYSTEM EVALUATION: Introduction, Measures used in system evaluation, Measurement example – TREC results.

TEXTBOOK:

1. Kowalski, Gerald, Mark T Maybury, *Information Retrieval Systems: Theory and Implementation*, Kluwer Academic Press, 1997.

REFERENCE BOOKS:

1. Frakes, W.B., Ricardo Baeza-Yates, *Information Retrieval Data Structures and Algorithms*, Prentice Hall, 1992.
2. Yates, *Modern Information Retrival*, I ed., Pearson Education.
3. Robert Korfhage, *Information Storage & Retieval*, John Wiley & Sons, 1997.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**4**	**0**	**4**

(10MT26304) PKI - TRUST MANAGEMENT
(ELECTIVE – II)

UNIT I: CRYPTOGRAPHY ON THE INTERNET-INTRODUCTION
Security on the internet, The second edition, Cryptography book, regrets, requests and thanks. Cryptography and its Important **-**The name of the game, cryptography importance, uses of cryptography, the concept devil is Alice. Principle of Cryptography

UNIT II: ADVANCED CRYPTOGRAPHY
Standardization in Cryptography, Standards, Standards in the real world, PKCS standards, IEEE P1363, Block cipher modes of operation and data transformation for asymmetrical algorithms-Block cipher modes of operation, Data transformation for RSA algorithm, Cryptographic Protocols-Protocols, Protocol properties, Protocols in cryptography, Attributes of cryptographic protocols

UNIT III: IMPLEMENTING CRYPTOGRAPHY
Crypto Hardware and software, Smart cards, Other crypto Hardware, Crypto Software, Universal Crypto interface, Real world attacks, Evaluation and certification, Public Key Infrastructure, PKI Works, Digital Certificates.

UNIT IV: CERTIFICATE SERVERS
Directory service, Requesting certificate revocation information, Practical Aspects Of PKI Construction-The course of construction of PKI, Basic questions about PKI construction, The most important PKI suppliers.

UNIT V: CRYPTO PROTOCOLS FOR THE INTERNET
The internet and the OSI model-The OSI model, Crypto standards for OSI Layers 1 and 2-Crypto extensions for ISDN (Layer 1), Cryptography in the GSM standard (Layer 1), Crypto extensions for PPP (Layer 2), Virtual private networks.

UNIT VI: IPSEC (LAYER 3)
IPsec and IKE, IPsec, IKE, SKIP, Critical assessment of IPsec, Virtual private network with IPsec,SSL, TLS AND WTLS (Layer 4**)-**SSL working method, SSL protocol operation, Successful SSL, Technical comparison between IPsec and SSL, WTLS.

UNIT VII: CRYPTOGRAPHIC STANDARDS FOR THE WORLD WIDE WEB (LAYER 7)

Basic authentication, Digital Access Authentication, HTTP on the top SSL(HTTPS), Digital signatures on the World Wide Web, Sundries.

UNIT VIII: E-MAIL ENCRYPTION STANDARD (LAYER 7)

E-mails on the internet, PEM, Open PGP, S/MIME, Mail trust.

TEXT BOOK:

1. Klaus schmeh, *Cryptography and public key infrastructure on the internet*, Allied Publishers, 2004.

REFERENCE BOOK:

1. Wenbo Mao, *Modern: Cryptography-theory and practice*, Pearson Education, 2005.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**4**	**0**	**4**

(10MT26305) TRUSTWORTHY COMPUTING
(ELECTIVE – II)

UNIT-I: DIGITAL LIABILITIES
Security in a globally connected economy, sources of digital liability, threats, vulnerabilities.

UNIT-II: RISK MANAGEMENT
Risk Exposure, An Affirmative model of defense: Digital liability Management, Models for estimating Risk and Optimizing the return on security investment.

UNIT III: POLICIES, PRACTICES AND DEFENSIVE TECHNOLOGY
Acceptable Use Policies: Human Defenses, Secure Use Practices: Defensive Best Practices.

UNIT IV: TECHNOLOGY AND AUDITING SYSTEMS
Introduction, Basic concepts, Hardware and Software Defenses.

UNIT V: COMPUTER FORENSICS
An Overview, Internet and online Resources, Security of Information, Intellectual property.

UNIT VI: ELECTRONIC EVIDENCE
Introduction, Electronics record management, Electronics Evidence,

UNIT VII: FRAUD AND COMPUTER CRIME LAWS
Computer Crime, Computer fraud and cyber Terrorism

UNIT VIII: PRIVACY
Privacy and data Protection

TEXT BOOK:
1. Linda Volonino, Robinson, *Principles and practice of information security*, Prentice Hall, 2004

REFERENCE BOOK:
1. John R.Vacca, *Computer Forensics: Computer Crime Scene Investigation*, II ed., Charles River Media.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**4**	**0**	**4**

(10MT26306) ELLIPTIC CURVE CRYPTOSYSTEMS
(ELECTIVE – II)

UNIT –I: INTRODUCTION TO PUBLIC KEY CRYPTOGRAPHY
Private Key Cryptography, Diffie-Hellman Key Exchange, Public Key Cryptography, Trapdoor on-way Functions Based on Groups, NIST Digital Signature Standard, Elliptic Curve Cryptosystems, Notes.

UNIT –II: INTRODUCTION OF ELLIPTIC CURVES
Definitions, Group Law, The Discriminant and j-Invariant, Curves over K, char(K) ≠ 2.3, Curves over K, char (K) =2, Group Structure, Divisor Theory, Elliptic Curves over Zn

UNIT – III: ISOMORPHISM CLASSES OF ELLIPTIC CURVES OVER FINITE FIELDS
Introduction, Isomorphism Classes of Curves over Fq, char (Eq) ≠ 2.3, Isomorphism Classes of Non-Supersingular curves over F_2m, Isomorphism Classes of Supersingular Curves over F_2m, m odd, Isomorphism Classes of supersingular Curves over F_2m, m even, Number of Points, Notes.

UNIT – IV: THE DISCRETE LOGARITHM PROBLEM
Introduction to problem, Algorithms, Reducing Some Logarithm Problems to Logarithms in a finite field.

UNIT – V: THE ELLIPTIC CURVE LOGARITHM PROBLEM
The Weil Pairing, Reducing Elliptic Curve Logarithms to Logarithms in a Finite Field, Cryptographic Implications, Finding the Group Structure, Notes.

UNIT – VI: IMPLEMENTATION OF ELLIPTIC CURVE CRYPTOSYSTEMS
Field Arithmetic in F_2m, Selecting a Curve and Field K, Projective Coordinates,
EIGamal Cryptosystem, performance, Using Supersingular Curves, Elliptic Curve Cryptosystems over Z_n, Implementations, Notes.

UNIT –VII: COUNTING POINTS ON ELLIPTIC CURVES OVER F_2M

Some Basics, Outline of Schoof's Algorithm, Some Heuristics, Finding and Eigenvalue of Ø , if One Exists, Schoof's Algorithm

UNIT -VIII: IMPLEMENTATION AND RESULTS

Determining t modulo l = 2^c, Baby-step Giant-step Algorithm, Checking Results, Implementation and Results, Recent work, Notes.

TEST BOOK:

1. Menezes, *Elliptic curve Public key Cryptosystems*, Kluwer Academic, 1993.

REFERENCE BOOK:

1. I. Blake, G. Seroussi and N. Smart, *Elliptic curves in Cryptography*, Cambridge University Press, 1999.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**4**	**0**	**4**

(10MT26307) NETWORK PROGRAMMING
(ELECTIVE – II)

UNIT-I: IPC
Introduction, Pipes, popen and pclose functions, FIFO's, streams and messages.
System V IPC: IPC_Perm Structure, IPC Permissions, Creating and Opening IPC Channels, Message queues (msgget, msgsnd, msgrcv, msgctl Functions), Shared Memory (shmget, shmat, shmdt,shmctlFunctions).

UNIT-II: INTRODUCTION TO NETWORK PROGRAMMING
OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT-III: SOCKETS
Address structures, value result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets - Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT-IV: TC CLIEN SERVER
Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT-V: I/O MULTIPLEXING AND SOCKET OPTIONS
I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket options.

UNIT-VI: ELEMENTARY UDP SOCKETS
Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT-VII: ELEMENTARY NAME AND ADDRESS CONVERSIONS

DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT-VIII: REMOTE LOGIN

Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC, Transparency Issues.

TEXT BOOKS:

1. W. Richard Stevens, *UNIX Network Programming IPC*, Vol. II, Pearson Education.
2. W.Richard Stevens, *UNIX Network Programming*, Vol. I, sockets API, II ed., Pearson Education.

REFERNCE BOOKS:

1. T Chan, *UNIX Systems Programming Using C++*, III ed., PHI.
2. Graham Glass, King Ables, *UNIX for programmers and Users*, III ed., Pearson Education.
3. M J Rochkind, *Advanced UNIX programming*, II ed., Pearson Education.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M.Tech. (CN&IS)	**L**	**P**	**C**
II Semester	**0**	**4**	**2**

(10MT26312) WIRELESS NETWORKS AND CLOUD COMPUTING LAB

List of Programmes:

1. Simulate TCP-SACK (Selective Acknowledgement Protocol) Protocol for Wireless Network.
2. Simulate Pure ALOHA Protocol and Slotted ALOHA Protocol
3. Simulate Carrier Sense Multiple Access (CSMA) Protocol
4. Simulate Destination Sequenced Distance Vector (DSDV) Routing Algorithm for Ad Hoc Networks
5. Simulate Ad Hoc On Demand Distance Vector (AODV) Routing Algorithm for Ad Hoc Networks
6. Create Public Cloud Using Open QRM Cloud Service
7. Create private Cloud Using Open QRM Cloud Service
8. Create Hybrid Cloud Using Open QRM Cloud Service
9. Create Public Cloud Using Open Eucalyptus Cloud Service
10. Create private Cloud Using Open Eucalyptus Cloud Service
11. Create Hybrid Cloud Using Open Eucalyptus Cloud Service

Course Structure for M. Tech. (DECS)

M. Tech. – I Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT13801	Advanced Digital Signal Processing	4	-	40	60	100	4
10MT13802	Digital Communication Techniques	4	-	40	60	100	4
10MT13803	Digital System Design	4	-	40	60	100	4
10MT13804	Embedded Systems	4	-	40	60	100	4
10MT13805	Microcomputer System Design	4	-	40	60	100	4
	Elective-I						
10MT13806	Advanced Computer Architectures	4	-	40	60	100	4
10MT13807	DSP Processors and Architectures						
10MT13808	Low Power VLSI Design						
10MT13809	Digital Systems Design Lab.	-	4	25	50	75	2
	Total	**24**	**4**	**265**	**410**	**675**	**26**

M. Tech. – II Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT23801	Adaptive Signal Processing	4	-	40	60	100	4
10MT23802	Coding Theory and Techniques	4	-	40	60	100	4
10MT23803	Detection and Estimation of Signals	4	-	40	60	100	4
10MT23804	High Performance Networks	4	-	40	60	100	4
10MT23805	Wireless Communications	4	-	40	60	100	4
	Elective-II						
10MT23806	Compression Techniques	4	-	40	60	100	4
10MT23807	Image Processing						
10MT23808	Optical Communications						
10MT23809	Industrial Visit/Seminar	-	-	50	-	50	2
10MT23810	Communications and Signal Processing Lab.	-	4	25	50	75	2
	Total	**24**	**4**	**315**	**410**	**725**	**28**

M. Tech. – III Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT33801	Project Work – Phase I	-	-	50	-	50	4
	Total			**50**	**-**	**50**	**4**

M. Tech. – IV Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT43801	Project Work – Phase II	-	-	50	100	150	12
	Total			**50**	**100**	**150**	**12**

Total Marks : 1600
Total Credits: 70

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13801) ADVANCED DIGITAL SIGNAL PROCESSING

UNIT I
OVERVIEW: Discrete-Time Signals, Sequences and sequence Representation, Discrete-Time Systems, Time-Domain Characterization and Classification of LTI Discrete-Time Systems. The Continuous-Time Fourier Transform, The discrete-Time Fourier Transform, energy Density Spectrum of a Discrete-Time Sequence, Band-Limited Discrete-Time signals, The Frequency Response of LTI Discrete-Time System.

UNIT II
LTI DISCRETE-TIME SYSTEMS IN THE TRANSFORM DOMAIN: Types of Linear-Phase transfer functions, Simple Digital Filters, Complementary Transfer Function, Inverse Systems, System Identification, Digital Two-Pairs, Algebraic Stability Test.

UNIT III
DIGITAL FILTER SRTUCTURE AND DESIGN: All Pass Filters, Tunable IIR Digital Filter, IIR Tapped Cascade Lattice Structures, FIR Cascaded Lattice Structures, Parallel All Pass Realization of IIR Transfer Functions, State Space Structures, Polyphase Structures, Digital Sine-Cosine Generator, Computational Complexity of Digital Filter Structures, Design of IIR Filter using pade' approximation, Least Square Design Methods, Design of Computationally Efficient FIR Filters.

UNIT IV
DSP ALGORITHEMS: Fast DFT algorithms based on Index mapping, Sliding Discrete Fourier Transform, DFT Computation Over a narrow Frequency Band, Split Radix FFT, Linear filtering approach to Computation of DFT using Chirp Z-Transform.

UNIT V
MULTI RATE SIGNAL PROCESSING: Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Filter design & Implementation for sampling rate conversion.

UNIT VI
POWER SPECTRAL ESTIMATION: Estimation of spectra from finite duration observation of signals, Non-parametric methods: Bartlett, Welch & Blackmann & Tukey methods.

UNIT VII
PARAMETRIC METHODS FOR POWER SPECTRUM ESTIMATION: Relation between auto correlation & model parameters, Yule-Waker & Burg Methods, MA & ARMA models for power spectrum estimation.

UNIT VIII

APPLICATIONS OF DIGITAL SIGNAL PROCESSING: Dual Tone Multi-frequency Signal Detection, Spectral Analysis of Sinusoidal Signals, Spectral Analysis of Non stationary Signals, Musial Sound Processing, Over Sampling A/D Converter, Over Sampling D/A Converter, Discrete-Time Analytic Signal Generation.

TEXTBOOKS:

1. Sanjit K Mitra, "Digital Signal Processing", Tata MCgraw Hill Publications.
2. J G Proakis, D G Manolokis, "Digital Signal Processing Principles, Algorithms and Applications", PHI.

REFERENCES:

1. A V Oppenhiem, R W Schafer, "Discrete-Time Signal Processing", Pearson Education.
2. Emmanuel C Ifeacher Barrie. W. Jervis, "DSP-A Practical Approach", Pearson Education.
3. S. M .Kay, "Modern spectral Estimation techniques", PHI, 1997.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13802) DIGITAL COMMUNICATION TECHNIQUES

UNIT I
REVIEW OF RANDOM VARIABLES AND PROCESSES: Random Variables, Probability Densities, Statistical Averages of Random Variables, Some Useful Distributions, Chebyshev Inequality, Central Limit Theorem, Stochastic Processes, Discrete Time Stochastic Signals and Systems.

UNIT II
CHARACTERIZATION OF COMMUNICATION SIGNALS AND SYSTEMS: Representation of Band Pass Signals and Systems, Signal Space Representation, Representation of digitally modulated signals, Spectral Characteristics of Digitally Modulated signals.

UNIT III
DIGITAL MODULATION TECHNIQUES: Factors that Influence digital modulation techniques, Linear Modulation Techniques – BPSK, DPSK, QPSK, OQPSK, ∏/4 QPSK, Constant envelope Modulation techniques - MSK, GMSK, Linear and constant envelope modulation techniques – M-ary PSK, M- ary QAM.

UNIT IV
COMMUNICATION OVER ADDITIVE GAUSSIAN NOISE CHANNELS: Optimum receiver for signals corrupted by AWGN, Performance of the optimum Receiver for Memory less Modulation, Optimum Receiver for CPM signals, Optimum Receiver for Signals with Random Phase in AWGN Channel.

UNIT V
CARRIER RECOVERY AND SYMBOL SYNCHRONIZATION: Carrier recovery and symbol synchronization in Signal demodulation, Phase locked loop, Effect of additive noise in phase estimation, non-decision directed loops, symbol timing estimation.

UNIT VI
COMMUNICATION THROUGH BAND LIMITED LINEAR FILTER CHANNELS: Optimum Receiver for Channels with ISI and AWGN, Linear Equalization and its Variations, Decision Feedback Equalization.

UNIT VII
SPREAD SPECTRUM SIGNALS FOR DIGITAL COMMUNICATIONS: Model of spread spectrum digital communication system, direct sequence spread Spectrum Digital signals, processing gain and Jamming Margin, Applications of DS-Spread Spectrum Signals, Generation of PN-Sequences, Frequency–Hopping Spread Spectrum Signals, Other Types of Spread Spectrum Signals.

UNIT VIII
SYNCHRONIZATION OF SPREAD SPECTRUM SYSTEMS: Coherent Direct-Sequence Receivers, Carrier Tracking- Coherent & Non Coherent, Delay-Lock Loop Analysis, Tau-Dither Loop, Acquisition of Spread-Spectrum Signals, Matched filters for PN Sequences.

Text Books:

1. John G. Proakis, "DIGITAL COMMUNICATIONS", McGraw Hill, 3rd edition, 1995.
2. Theodore S. Rappaport, "Wireless Communications", Pearson Education, 2nd edition, 2002.
3. George R. Cooper & Clare D. McGillem, "Modern Digital Communication and Spread Spectrum", McGraw-Hill Book Company, 1986.

References:

1. Marvin K. Simon, Jim K Omura, Robert A. Scholtz & Barry K.Levit, "Spread Spectrum Communications", 1995.
2. J.Marvin, K.Simon, Sami. M.Hinedi and William C. Lindsey, "Digital Communication Techniques", PHI.
3. William Feller, "An Introduction to Probability Theory and Its Applications", Wiley, Vol 11, 2000.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13803) DIGITAL SYSTEM DESIGN

UNIT I
DESIGN OF DIGITAL SYSTEMS: ASM charts, Hardware description language and control sequence method, Reduction of state tables, state assignments.

UNIT II
SEQUENTIAL CIRCUIT DESIGN: design of Iterative circuits, design of sequential circuits using ROMs and PLAs, sequential circuit design using CPLD, FPGAs.

UNIT III
FAULT MODELING: Fault classes and models – Stuck at faults, bridging faults, transition and intermittent faults.
TEST GENERATION: Fault diagnosis of Combinational circuits by conventional methods – Path Sensitization technique, Boolean difference method, Kohavi algorithm.

UNIT IV
TEST PATTERN GENERATION: D – algorithm, PODEM, Random testing, transition count testing, Signature Analysis and testing for bridging faults.

UNIT V
FAULT DIAGNOSIS IN SEQUENTIAL CIRCUITS: State identification and fault detection experiment. Machine identification, Design of fault detection experiment.

UNIT VI
PROGRAMMING LOGIC ARRAYS: Design using PLA's, PLA minimization and PLA folding.

UNIT VII
PLA TESTING: Fault models, Test generation and Testable PLA design.

UNIT VIII
ASYNCHRONOUS SEQUENTIAL MACHINE: fundamental mode model, flow table, state reduction, minimal closed covers, races, cycles and hazards.

TEXTBOOKS:

1. Z. Kohavi, "Switching & finite Automata Theory", TMH.
2. N. N. Biswas, "Logic Design Theory", PHI.
3. Nolman Balabanian, Bradley Calson, "Digital Logic Design Principles", Wily Student Edition 2004.

REFRENCES:

1. M. Abramovici, M.A.Breues, A.D.Friedman, "Digital System Testing and Testable Design", Jaico Publications.
2. Charles H. Roth Jr., "Fundamentals of Logic Design".
3. Frederick. J.Hill & Peterson, "Computer Aided Logic Design", Wiley 4th

Edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13804) EMBEDDED SYSTEMS

UNITI
INTRODUCTION: Embedded system overview, embedded hardware units, embedded software in a system, embedded system on chip (SOC), design process, classification of embedded systems

UNIT II
EMBEDDED COMPUTING PLATFORM: CPU Bus, memory devices, component interfacing, networks for embedded systems, communication interfacings: RS232/UART, RS422/RS485, IEEE 488 bus.

UNIT III
SURVEY OF SOFTWARE ARCHITECTURE: Round robin, round robin with interrupts, function queue scheduling architecture, selecting an architecture, saving of memory space.

UNIT IV
EMBEDDED SOFTWARE DEVELOPMENT TOOLS: Host and target machines, linkers and locators for embedded software, getting embedded software into target system, debugging technique.

UNIT V
RTOS CONCEPTS: Architecture of the kernel, interrupt service routines, semaphores, message queues, pipes.

UNIT VI
INSTRUCTION SETS: Introduction, preliminaries, ARM processor, SHARC processor.

UNIT VII
SYSTEM DESIGN TECHNIQUES: Design methodologies, requirement analysis, specifications, system analysis and architecture design

UNIT VIII
DESIGN EXAMPLES: Telephone PBX, ink jet printer, water tank monitoring system, GPRS, Personal Digital Assistants, Set Top boxes.

TEXT BOOKS:

1. Wayne Wolf, "Computers as a component: principles of embedded computing system design".
2. David E. Simon, "An embedded software premier".
3. KVKK Prasad, "Embedded / real time systems", Dreamtech press, 2005.

REFERENCES:

1. Sri Ram V Iyer, Pankaj Gupta, "Embedded real time systems programming", TMH, 2004.
2. Frank Vahid, Tony D. Givargis, "Embedded system design - A unified hardware/software introduction", John Willey, 2002.

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13805) MICROCOMPUTER SYSTEM DESIGN

UNIT I
REVIEW OF 8086 PROCESSOR: Architecture, Register organization, Addressing Modes and Instruction Set (Brief treatment only), Difference between 8086 and 8088 with rest to pin structures.

UNIT II
THE 80286 MICRO PROCESSORS: Architecture, Register Organization, Addressing Modes and instruction sets of 80286 (brief treatment only)

UNIT III
THE 80386, AND 80486 MICRO PROCESSORS: Architectural features, Register Organization, Memory management, Virtual 8086 mode, The Memory Paging Mechanism, Pin Definitions of 80386 and 80486 (brief treatment).

UNIT IV
THE PENTIUM AND PENTIUM PRO PROCESSORS: The Memory System, Input/output system, Branch Pridiction Logic, Cache Structure, Pentium Registers, Serial Pentium pro features.

UNIT V
THE PENTIUM IV AND DUAL CORE MICRO PROCESSORS: Architecture, Special Registers and Pin Structures (brief treatment only)

UNIT VI
I/O PROGRAMMING: Fundamentals of I/O Considerations Programmed I/O, Interrupt I/O, Block Transfers and DMA, I/O Design Example.

UNIT VII
INTRODUCTION TO MULTIPROGRAMMING: Process Management, Semaphores Operations, Common Procedure Sharing, Memory Management, Virtual Memory Concept of 80286 and other advanced Processors.

UNIT VIII
ARITHMETIC COPROCESSOR, MMX AND SIMD TECHNOLOGIES: Data formals for Arithmetic Coprocessor, Internal Structure of 8087 and Advanced Coprocessors. Instruction Set (brief treatment).

TEXTBOOKS:
1. Barry, B. Brey, "The Intel Microprocessors", Pearson Education, 8th edition, 2009.
2. A.K.Ray and K.M.Bhurchandi, "Advanced Microprocessor and Peripherals", TMH.

REFERENCES:
1. YU-Chang, Glenn A. Gibson, "Micro Computer Systems: The 8086/8088 Family Architecture, Programming and Design", Pearson Education, 2nd Edition, 2007.
2. Douglas V. Hall, "Microprocessors and Interfacing", Special Indian Edition, 2006.

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13806) ADVANCED COMPUTER ARCHITECTURE (ELECTIVE I)

UNIT I
FUNDAMENTALS OF COMPUTER DESIGN: Technology trends, cost-measuring and reporting performance quantitative principles of computer design.

UNIT II
INSTRUCTION SET PRINCIPLES AND EXAMPLES: classifying instruction set- memory addressing- type and size of operands-addressing modes for signal processing-operations in the instruction set, instructions for control flow, encoding an instruction set, the role of compiler

UNIT III
INSTRUCTION LEVEL PARALLELISM (ILP): over coming data hazards- reducing branch costs, high performance instruction delivery, hardware based speculation, limitation of ILP

UNIT IV
ILP SOFTWARE APPROACH: compiler techniques- static branch protection, VLIW approach, H.W support for more ILP at compile time- H.W verses S.W solutions

UNIT V
MEMORY HIERARCHY DESIGN: cache performance, reducing cache misses penalty and miss rate, virtual memory, protection and examples of VM.

UNIT VI
MULTIPROCESSORS AND THREAD LEVEL PARALLELISM: symmetric shared memory architectures, distributed shared memory, Synchronization, multi threading.

UNIT VII
STORAGE SYSTEMS- Types, Buses, RAID, errors and failures, bench marking a storage device, designing a I/O system.

UNIT VIII
INTER CONNECTION NETWORKS AND CLUSTERS: interconnection network media, practical issues in interconnecting networks- examples, clusters, designing a cluster

TEXT BOOKS:
1. John L. Hennessy & David A. Patterson Morgan Kufmann, "Computer Architecture A quantitative approach, An Imprint of Elsevier", 3rd edition.

REFERENCES:
1. Kai Hwang and A.Briggs, "Computer Architecture and parallel processing", McGraw-Hill, International Edition.
2. Dezso Sima, Terence Fountain, Peter Kacsuk, "Advanced Computer Architectures", Pearson.

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13807) DSP PROCESSORS AND ARCHITECTURES (ELECTIVE I)

UNIT I

INTRODUCTION TO DIGITAL SIGNAL PROCESING: Introduction, A Digital signal-processing system, The sampling process, Discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and interpolation, Analysis and Design tool for DSP Systems MATLAB, DSP using MATLAB.

UNIT II

COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATIONS: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT III

ARCHITECTURES FOR PROGRAMMABLE DSP DEVICES: Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT IV

EXECUTION CONTROL AND PIPELINING: Hardware looping, Interrupts, Stacks, Relative Branch support, Pipelining and Performance, Pipeline Depth, Interlocking, Branching effects, Interrupt effects, Pipeline Programming models.

UNIT V

PROGRAMMABLE DIGITAL SIGNAL PROCESSORS: Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX Processors, Pipeline Operation of TMS320C54XX Processors.

UNIT VI

IMPLEMENTATIONS OF BASIC DSP ALGORITHMS: The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing.

UNIT VII

IMPLEMENTATION OF FFT ALGORITHMS: An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

UNIT VIII

INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSP DEVICES: Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

TEXT BOOKS:

1. Avtar Singh and S. Srinivasan, "Digital Signal Processing", Thomson Publications, 2004.
2. Lapsley et al., "DSP Processor Fundamentals, Architectures & Features", S. Chand & Co, 2000.

REFERENCES:

1. B.Venkata Ramani and M. Bhaskar, "Digital Signal Processors, Architecture, Programming and Applications", TMH, 2004.
2. Jonatham Stein, "Digital Signal Processing", John Wiley, 2005.

M. Tech. (DECS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT13808) LOW POWER VLSI DESIGN (ELECTIVE I)

UNIT I
LOW POWER DESIGN, AN OVER VIEW: Introduction to low- voltage low power design, limitations, Silicon-on-Insulator.

UNIT II
MOS/Bi-CMOS PROCESSES: Bi-CMOS processes, Integration and Isolation considerations, Integrated Analog/Digital CMOS Process.

UNIT III
LOW-VOLTAGE/LOW POWER CMOS/ BICMOS PROCESSES: Deep submicron processes, SOI CMOS, lateral BJT on SOI, future trends and directions of CMOS/Bi-CMOS processes.

UNIT IV
DEVICE BEHAVIOR AND MODELING: Advanced MOSFET models, limitations of MOSFET models, Bipolar models. Analytical and Experimental characterization of sub-half micron MOS devices, MOSFET in a Hybrid mode environment.

UNIT V
CMOS AND Bi-CMOS LOGIC GATES: Conventional CMOS and Bi-CMOS logic gates, Performance Evaluation.

UNIT VI
LOW- VOLTAGE LOW POWER LOGIC CIRCUITS: Comparison of advanced Bi-CMOS Digital circuits. ESD-free Bi-CMOS, Digital circuit operation and comparative Evaluation.

UNIT VII
LOW POWER LATCHES AND FLIP FLOPS: Evolution of Latches and Flip flops-quality measures for latches and Flip flops, Design perspective.

UNIT VIII
SPECIAL TECHNIQUES: Power Reduction in Clock Networks, CMOS Floating Node,
Low Power Bus, Delay Balancing, Low Power Techniques for SRAM.

TEXT BOOKS:
1. Yeo Rofail/ Gohl (3 Authors), "CMOS/Bi-CMOS ULSI low voltage, low power", Pearson Education Asia 1st Indian reprint, 2002.
2. Gary K. Yeap, "Practical Low Power Digital VLSI Design", KAP, 2002.

REFERENCES:
1. Douglas A.Pucknell & Kamran Eshraghian, "Basic VLSI Design", PHI, 3rd edition.
2. J.Rabaey, "Digital Integrated circuits", PH. N.J 1996.
3. Sung-mo Kang & yusuf leblebici, "CMOS Digital ICs", TMH, 3rd edition, 2003.
4. IEEE Trans on Electron Devices, IEEE J. Solid State Circuits, and other National and International Conferences and Symposia.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
I SEMESTER	-	-	4	2

(10MT13809) DIGITAL SYSTEM DESIGN LAB

CYCLE 1:

1. Simulation and Verification of Logic Gates.
2. Design and Simulation of Half adder, Serial Binary Adder, Multi Precession Adder, Carry Look Ahead Adder and Full Adder.
3. Simulation and Verification of Decoder, MUXs, Encoder using all Modeling Styles.
4. Modeling of Flip-Flops with Synchronous and Asynchronous reset.
5. Design and Simulation of Counters- Ring Counter, Johnson Counter, and Up- Down Counter, Ripple Counter.
6. Design of a N- bit Register of Serial-in Serial-out, Serial in Parallel out, Parallel in Serial out and Parallel in Parallel Out.
7. Design of Sequence Detector (Finite State Machine- Mealy and Moore Machines).
8. 4- Bit Multiplier, Divider. (for 4-Bit Operand)
9. Design ALU to Perform – ADD, SUB, AND-OR, 1's and 2's COMPLIMENT, Multiplication, Division.

CYCLE 2: After Digital Circuit Description Using Verilog/ VHDL.

1. Verification of the Functionality of the circuit using function Simulators.
2. Timing Simulator for Critical Path time Calculation.
3. Synthesis of Digital Circuit.
4. Place and Router Techniques for FPGA's like Xilinx, Altera, Cypress, etc.,
5. Implementation of Design using FPGA and CPLD Devices.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23801) ADAPTIVE SIGNAL PROCESSING

UNIT I

EIGEN ANALYSIS: Eigen Value Problem, Properties of eigen values and eigen vectors, Eigen Filters, eigen Value computations.

UNIT II

INTRODUCTION TO ADAPTIVE SYSTEMS: Definitions, Characteristics, Applications, Example of an Adaptive System. The Adaptive Linear Combiner - Description, Weight Vectors, Desired Response Performance function, Gradient & Mean Square Error.

UNIT III

DEVELOPMENT OF ADAPTIVE FILTER THEORY & SEARCHING THE PERFORMANCE SURFACE: Introduction to Filtering, Smoothing and Prediction, Linear Optimum Filtering, Problem statement, Principle of Orthogonality - Minimum Mean Square Error, Wiener- Hopf equations, Error Performance - Minimum Mean Square Error.

SEARCHING THE PERFORMANCE SURFACE – Methods & Ideas of Gradient Search methods, Gradient Searching Algorithm & its Solution, Stability & Rate of convergence - Learning Curves.

UNIT IV

STEEPEST DESCENT ALGORITHMS: Gradient Search by Newton's Method, Method of Steepest Descent, Comparison of Learning Curves.

UNIT V

LMS ALGORITHM & APPLICATIONS: Overview - LMS Adaptation algorithms, Stability & Performance analysis of LMS Algorithms - LMS Gradient & Stochastic algorithms, Convergence of LMS algorithm.

Applications: Noise cancellation, Cancellation of Echoes in long distance telephone circuits, Adaptive Beam forming.

UNIT-VI

RLS ALGORITHM: Matrix Inversion lemma, Exponentially weighted recursive least square algorithm, update recursion for the sum of weighted error squares, convergence analysis of RLS Algorithm, Application of RLS algorithm on Adaptive Equalization

UNIT VII

KALMAN FILTERING: Introduction, Recursive Mean Square Estimation Random variables, Statement of Kalman filtering problem, Filtering, Initial conditions, Variants of Kalman filtering, Extend Kalman filtering.

UNIT VIII

NON LINEAR ADAPTIVE FILTERING: Theoretical and Practical considerations of Blind Deconvolution, Buss Gang Algorithm for blind Equalization of real base band Channels.

TEXT BOOKS:

1. Bernard Widrow, Samuel D.Strearns, "Adaptive Signal Processing", PE, 2005.
2. Simon Haykin, "Adaptive Filter Theory", PE Asia, 4th edition, 2002.

REFERENCES:

1. Sophocles. J.Orfamadis, "Optimum signal processing: An introduction", McGraw-Hill, Newyork, 2nd edition, 1988.
2. S.Thomas Alexander, "Adaptive signal processing-Theory and Applications", Springer –Verlag, 1986.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23802) CODING THEORY AND TECHNIQUES

UNIT I
SOURCE CODING: Mathematical model of Information, A Logarithmic Measure of Information, Average and Mutual Information and Entropy, coding for Discrete less sources, Source coding theorem, fixed length and variable length coding, properties of prefix codes.

UNIT II
Shannon-Fano coding, Huffman code, Huffman code applied for pair of symbols, efficiency calculations, Lempel-Ziv codes.

UNIT III
LINEAR BLOCK CODES: Introduction to Linear block codes, Generator Matrix, Systematic Linear Block codes, Encoder Implementation of Linear Block Codes, Parity Check Matrix, Syndrome testing, Error Detecting and correcting capability of Linear Block codes.

UNIT IV
Hamming Codes, Probability of an undetected error for linear codes over a Binary Symmetric Channel, Weight Enumerators and Mac-Williams identities, Perfect codes, Application of Block codes for error control in data storage Systems.

UNIT V
CYCLIC CODES: Algebraic structure of cyclic codes, Binary Cyclic code properties, Encoding in systematic and non-systematic form, Encoder using (n-k) bit shift register, Syndrome Computation and Error detection, Decoding of Cyclic Codes.

UNIT VI
CONVOLUTIONAL CODES: encoding of Convolutional codes, Structural properties of Convolutional codes, state diagram, Tree diagram, Trellis Diagram, maximum, Likelihood decoding of Convolutional codes.

UNIT VII
Viterbi Algorithm, Fano, Stack Sequential decoding algorithms, Application of Viterbi and sequential decoding.

UNIT VIII
BCH CODES: Groups, fields, binary Fields arithmetic, construction of Galois fields GF (2^m), Basic properties of Galois Fields, Computation using Galois Field GF (2^m) arithmetic, Description of BCH codes, Decoding procedure for BCH codes.

TEXT BOOKS:

1. SHU LIN and Daniel J. Costello, Jr., "Error Control Coding – Fundamentals and Applications", Prentice Hall Inc.
2. Bernard sklar, "Digital Communications – Fundamental and Application", Pearson Education, Asia.
3. Man Young Rhee, "Error Control Coding Theory", McGraw Hill Publications.

REFERENCES:

1. John G. Proakis, "Digital Communications", Mc. Graw Hill Publication.
2. K.Sam Shanmugam, "Digital and Analog Communication Systems", Wisley Publications.
3. Symon Haykin, "Digital Communications", Wisley Publications.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23803) DETECTION AND ESTIMATION OF SIGNALS

UNIT I
DETECTION THEORY: Binary decisions - Single observation- Maximum likelihood decision criterion, Neymann-Pearson criterion, Probability of error criterion, Bayes risk criterion, Minimax criterion, Robust detection, Receiver operating characteristics.

UNIT II&III
BINARY DECISIONS - MULTIPLE OBSERVATIONS: Vector observations, the general Gaussian Problem, Waveform Observation in Additive Gaussian Noise, The Integrating Optimum Receiver; Matched Filter Receiver.

UNIT IV&V
ESTIMATION THEORY: Methods -Maximum likelihood estimation; Bayes cost method Bayes estimation criterion - Mean square error criterion; Uniform cost function; absolute value cost function; Linear minimum variance - Least squares method; Estimation in the presence of Gaussian noise - Linear observation; Non-linear estimation.

UNIT VI
PROPERTIES OF ESTIMATORS: Bias, Efficiency, Cramer Rao bound Asymptotic properties, Sensitivity and error analysis.

UNIT VII
STATE ESTIMATION: Prediction, Kalman filter.

UNIT VIII
SUFFICIENT STATISTICS AND STATISTICAL ESTIMATION OF PARAMETERS: Concept of sufficient statistics, Exponential families of Distributions, Exponential families and Maximum likelihood estimation, uniformly minimum variance unbiased estimation.

TEXT BOOKS:

1. James L.Melsa & David L.Cohn, "Decision and Estimation Theory", McGraw Hill, 1978.
2. Dimitri Kazakos, P. Papantoni Kazakos, "Detection and Estimation", Computer Science Press, 1990.
3. Steven M. Kay, "Statistical Signal Processing Vol. 1: Estimation Theory, Vol. 2: Detection Theory", Prentice Hall Inc., 1998.

REFERENCES:

1. Harry L. Van Trees, "Detection, Estimation and Modulation Theory", Part 1, John Wiley & Sons Inc. 1968.
2. Jerry M. Mendel, "Lessons in Estimation Theory for Signal Processing, Communication and Control", Prentice Hall Inc., 1995.
3. Sophocles J.Orfanidis, "Optimum Signal Processing", McGraw Hill, 2nd edition, 1988.
4. Monson H. Hayes, "Statistical Digital Signal Processing and Modeling", John Wiley & Sons Inc., 1996.

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23804) HIGH PERFORMANCE NETWORKS

UNIT I
NETWORK SERVICES & LAYERED ARCHITECTURE: Traffic characterization and quality of service, Network services, High performance networks, Network elements, Basic network mechanisms, layered architecture.

UNIT II
ISDN & B-ISDN: Over view of ISDN, ISDN channels, User access, ISDN protocols, Brief history of B-ISDN and ATM, ATM based services and applications, principles and building block of B-ISDN, general architecture of B-ISDN, frame relay.

UNIT III
ATM NETWORKS: Network layering, switching of virtual channels and virtual paths, applications of virtual channels and connections.

UNIT IV
QOS parameters, traffic descriptors, ATM service categories, ATM cell header, ATM layer, ATM adaptation layer.

UNIT V
INTERCONNECTION NETWORKS: Introduction, Banyan Networks, Routing algorithm & blocking phenomenon, Batcher-Banyan networks, crossbar switch, three stage class networks.

UNIT VI
REARRANGEABLE NETWORKS: Rearrangeable class networks, folding algorithm, bens network, looping algorithm.

UNIT VII
ATM SIGNALING, ROUTING AND TRAFFIC CONTROL: ATM addressing, UNI signaling, PNNI signaling, PNNI routing, ABR Traffic management.

UNIT VIII
TCP/IP NETWORKS: History of TCP/IP, TCP application and Services, Motivation, TCP, UDP, IP services and Header formats, Internetworking, TCP congestion control, Queue management: Passive & active, QOS in IP networks: differentiated and integrated services.

TEXT BOOKS:
1. William Stallings, "ISDN & B-ISDN with Frame Relay", PHI.
2. Leon Garcia widjaja, "Communication Networks", TMH, 2000.
3. N. N. Biswas, "ATM Fundamentals", Adventure books publishers, 1998.

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23805) WIRELESS COMMUNICATIONS

UNIT I
INTRODUCTION TO WIRELESS COMMUNICATIONS SYSTEMS: Evolution, Examples of wireless communications systems, Comparison, Second Generation Cellular Networks, WLL, Bluetooth and Personal Area networks.

UNIT II
LARGE SCALE PATH LOSS AND SHADOWING: Introduction to radio wave propagation, Free Space Propagation Model, Propagation mechanisms, Reflection, Ground Reflection (Two Ray) model, Diffraction, Scattering, outdoor Propagation Model and In door Propagation model.

UNIT III
SMALL SCALE FADING AND MULTIPATH: Small Scale Multipath Propagation, Impulse Response Model of a multipath Channel, Small Scale Multipath Measurements, Parameters of a Mobile Multipath Channels, types of Small Scale Fading, Statistical models for Multipath Fading Channels, Theory of Multipath Shape Factors for Small Scale Fading Wireless Channels.

UNIT IV
DIVERSITY TECHNIQUES: Time Diversity, Frequency Diversity, polarization Diversity and Space Diversity, Receiver Diversity-Concept of diversity branches and signal paths, combining methods: Selective diversity combining, Scanning diversity, maximal ratio combining and Equal gain combining, Performance analysis for Rayleigh fading channels (of selection and maximal ratio combining),RAKE Receiver, Interleaving as time diversity.

UNIT V
CELLULAR CONCEPT- SYSTEM DESIGN FUNDMENTALS: Frequency reuse, Channel assignment strategies, Handoff strategies, Interference and System Capacity—Co-channel Interference and System Capacity, Capacity of Cellular CDMA, Capacity of CDMA with Multiple Cells, Channel Planning for Wireless systems, Adjacent channel Interference, Trunking and Grade of Service, Improving Capacity-Cell Splitting and Sectorization,

UNIT VI
ACCESS AND DUPLEX TECHNIQUES: FDMA, TDMA, Frame Slot Format for TDMA Systems, Super Frame Format, Synchronization of Slot, Frame & Super Frame, CDMA, Near Far Problem and Power Control, Synchronization Specific for CDMA, Comparison of FDMA, TDMA and CDMA, FDD&TDD.

UNIT VII
INTRODUCTION TO SPACE-TIME WIRELESS COMMUNICATIONS: Introduction, Exploiting Multiple antennas in wireless links, Space-Time (ST) Channel and Signal Models-SIMO, MISO, MIMO Channels, Physical Scattering Models for ST Channels, Sampled Signal Model, Capacity of ST Channels-Capacity of Frequency flat deterministic MIMO channel, Channel unknown & known to the transmitter, Capacity of random MIMO channels, Capacity to frequency selective MIMO channels.

UNIT VIII

WIRELESS SYSTEMS AND STANDARDS: GSM for Mobile - Specifications and Air Interface, CDMA digital Cellular Standard (IS 95)-Frequency and Channel Specifications, Forward and Reverse Channels, CDMA 3G Systems: UMTS & CDMA 2000 standards and Specifications.

TEXT BOOKS:

1. T.S. Rappaport, "Wireless communications, principals & practice", PHI, 2nd edition, 2001.
2. Andrea Goldsmith, "Wireless communications", Cambridge University press.
3. Arogya Swamy Paulraj, Rohit Nabar & D.Gore, "Introduction to Space-Time Wireless Communications", Cambridge university press, 2003.
4. G.L.Stuber, "Principals of mobile communications", kluwer academic publishers, 2nd edition.

REFERENCES:

1. Seiichi Samei, "Applications of Digital Wireless Technologies to Global Wireless Communications", Prentice Hall PTR, NJ, 1997.
2. A.J.Viterbi, "CDMA- Principals of Spread Spectrum", Addison Wesley, 1995.
3. Kamilo Feher, "Wireless Digital Communication", PHI, 1995.
4. R.L Peterson, R.E. Ziemer and David E.Borth, "Introduction to Spread Spectrum Communication", Pearson Education.
5. T L Singal, "Wireless Communications", Tata McGraw Hill, 2010.
6. Simon Haykin and Michael, "Modern Wireless Communications", Pearson Education.

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23806) COMPRESSION TECHNIQUES (ELECTIVE II)

UNIT I&II

REVIEW OF INFORMATION THEORY: The discrete memoryless information source, Kraft inequality; optimal codes Source coding theorem. Compression Techniques, Lossless and Lossy Compression, Mathematical Preliminaries for Lossless Compression, Huffman Coding, Optimality of Huffman codes, Extended Huffman Coding, Adaptive Huffman Coding, Arithmetic Coding, Adaptive Arithmetic coding, Run Length Coding.

UNIT III

DICTIONARY TECHNIQUES: Static Dictionary, Adaptive Dictionary, LZ77, LZ78, LZW, Applications, Predictive Coding, Prediction with Partial Match, Burrows Wheeler Transform, Sequitur, Lossless Compression Standards (files, text, and images, faxes), Dynamic Markov Compression.

UNIT IV

MATHEMATICAL PRELIMINARIES FOR LOSSY CODING: Rate distortion theory: Rate distortion function R(D),Properties of R(D); Calculation of R(D) for the binary source and the Gaussian source, Rate distortion theorem, Converse of the Rate distortion theorem,

UNIT V

QUANTIZATION: Uniform & Non-uniform, optimal and adaptive quantization, vector quantization and structures for VQ, Optimality conditions for VQ, Predictive Coding, Differential Encoding Schemes.

UNIT VI

MATHEMATICAL PRELIMINARIES FOR TRANSFORMS: Karhunen Loeve Transform, Discrete Cosine and Sine Transforms, Discrete Walsh Hadamard Transform, Lapped transforms- Transform coding, Subband coding, Wavelet Based Compression, Analysis/Synthesis Schemes.

UNIT VII

DATA COMPRESSION STANDARDS: Zip and Gzip, Speech Compression Standards: MPEG, JPEG 2000. MPEG, H264.

UNIT VIII

IMAGE COMPRESSION STANDARDS: Binary Image Compression Standards, Continuous Tone Still Image Compression Standards, Video Compression Standards.

TEXT BOOKS:

1. Khalid Sayood, "Introduction to Data Compression", Morgan Kaufmann Publishers., 2nd edition, 2005.
2. David Salomon, "Data Compression: The Complete Reference", Springer Publications, 4th edition, 2006.
3. Thomas M.Cover, Joy A.Thomas, "Elements of Information Theory", John Wiley & Sons, Inc., 1991.

REFERENCES:

1. Toby Berger, "Rate Distortion Theory: A Mathematical Basis for Data Compression", Prentice Hall, Inc., 1971.
2. K.R.Rao, P.C.Yip, "The Transform and Data Compression Handbook", CRC Press, 2001.
3. R.G.Gallager, "Information Theory and Reliable Communication", John Wiley & Sons, Inc., 1968.
4. Ali N. Akansu, Richard A. Haddad, "Multiresolution Signal Decomposition: Transforms, Subbands and Wavelets", Academic Press, 1992.
5. Martin Vetterli, Jelena Kovacevic, "Wavelets and Subband Coding", Prentice Hall Inc., 1995.
6. Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", Pearson Education.

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23807) IMAGE PROCESSING (ELECTIVE II)

UNIT I

IMAGE REPRESENTATION: Gray scale and colour Images, image sampling and quantization. Two dimensional orthogonal transforms: DFT, WHT, Haar transform, KLT, DCT.

UNIT II

IMAGE ENHANCEMENT: Filters in spatial and frequency domains, histogram-based processing, homomorphic filtering. Edge detection, non parametric and model based approaches, LOG filters, localization problem.

UNIT III

IMAGE RESTORATION: Degradation Models, PSF, circulant and block - circulant matrices, deconvolution, restoration using inverse filtering, Wiener filtering and maximum entropy-based methods.

UNIT IV

IMAGE SEGMENTATION: Pixel classification, Bi-level Thresholding, Multi-level Thresholding, P-tile method, Adaptive Thresholding, Spectral & spatial classification, Edge detection, Hough transform, Region growing.

UNIT V

FUNDAMENTAL CONCEPTS OF IMAGE COMPRESSION: Compression models, Information theoretic perspective, Fundamental coding theorem.

UNIT VI

LOSSLESS COMPRESSION: Huffman Coding, Arithmetic coding, Bit plane coding, Run length coding, Lossy compression: Transform coding, Image compression standards.

UNIT VII

VIDEO PROCESSING: Representation of Digital Video, Spatio-temporal sampling, Motion Estimation.

UNIT VIII

Video Filtering, Video Compression, Video coding standards.

TEXT BOOKS/REFERENCES:

1. R.C.Gonzalez, R.E.Woods, "Digital Image Processing", Pearson Education. 2nd edition, 2002.
2. W. K. Pratt, "Digital image processing", Prentice Hall, 1989.
3. A.Rosenfold & A.C.Kak, "Digital image processing", Prentice Hall, Vols.1&2, 1986.
4. H.C.Andrew & B.R.Hunt, "Digital image restoration", Prentice Hall, 1977.
5. R.Jain, R.Kasturi and B.G.Schunck, "Machine Vision", McGraw-Hill International Edition, 1995.
6. A.M.Tekalp, "Digital Video Processing", Prentice-Hall, 1995.
7. A.Bovik, "Handbook of Image & Video Processing", Academic Press, 2000.

M. Tech. (DECS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23808) OPTICAL COMMUNICATIONS (ELECTIVE II)

UNIT I

INTRODUCTION: Evolution of fiber types, guiding properties of fibers, cross talk between fibers, coupled modes and mode mixing, dispersion properties of fibers, nonlinear properties of optical fibers, SRS, SBS, intensity dependent refractive index.

UNIT II

OPTICAL AND MECHANICAL CHARACTERIZATION OF FIBERS

Fiber design considerations: diameter, cladding, thickness, low and high bit rate systems, characterization of materials for fibers, fiber perform preparation, fiber drawing and control, roles of coating and jacketing.

UNIT III

OPTICAL CABLE DESIGN: Design objectives and cable structures, fiber splicing, fiber end preparation, single and array splices, measurement of splicing efficiency, optical fiber connectors, Connector alignments.

UNIT IV

OPTICAL SOURCES AND DETECTORS: optical sources for communication, LED, injection lasers, modulation technique, direct and indirect methods, optical waveguide devices. Photodiodes in repeaters, receiver design, digital and analog, transmission system design, system design choices, passive and low speed active optical components for fiber system, micro-optic components, lens-less components.

UNIT V

OPTICAL FIBER COMPONENTS: couplers, Isolators and Circulators, Multiplexers, Bragg grating, Fabry-perot Filters, Mach zender interfermometers, Arrayed waveguide grating, tunable filters, hi-channel count multiplexer architectures, optical amplifiers, direct and external modulation transmitters, pump sources for amplifiers, optical switching and wave length converters.

UNIT VI

OPTICAL FIBER TECHNIQUES: Modulation and demodulation, signal formats, direction detection receivers, coherent detection.

UNIT-VII

ACCESS NETWORK: Network architecture, HFC, FTTC, optical access network architecture, deployment considerations, upgrading the transmission capacity, SDM, TDM, WDM, application areas, inter exchange, undersea, local exchange networks; Packaging and cabling of photonics components- photonic packet switching, OTDM, multiplexing and demultiplexing, optical logic gates, synchronization, broadcast OTDM network, OTDM testbeds.

UNIT-VIII

SOLITON COMMUNICATION: Basic principle, metropolitan optical network, cable TV network, optical access network, photonics simulation tools, error control coding techniques, nonlinear optical effects in WDM transmission.

TEXT BOOKS:

1. S.E.Miller, A.G.Chynoweth, "Optical Fiber Telecommunication", (Unit I, II, III, VI).
2. Rajiv Ramaswamy and Kumar and N. Sivaranjan, "Optical Networks", (Unit V, VI, VII).
3. I Kaninov, T Li, "Optical Fiber Telecommunication IV B", (Unit VIII).

REFERENCES:

1. S E Miller, I Kaninov, "Optical Fiber Telecommunication II".
2. Govind Agarwal, "Optical Fiber Communications".
3. Gil Held, "Deploying Optical Network Components".
4. Gerd Kaiser, "Optical Fiber Communication", McGraw Hill.
5. John. M. Senior, "Optical fiber communications: Principles and Practice".

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (DECS)	L	T	P	C
II SEMESTER	-	-	4	2

(10MT23810) COMMUNICATIONS AND SIGNAL PROCESSING LAB

1. Simulation Rayleigh Fading Channel Using Either Clarke's Model or Jake's Model for different Doppler Spreads (Ex. 50 Hz and 100 Hz).
2. Generation of Maximal Sequences and Gold Sequences.
3. Design and Simulation FIR Filter Using any Windowing Technique.
4. Design of IIR Filters from Analog Filters.
5. Performance Evaluation of QPSK System over Gaussian AWGN Channel.
6. Performance Evaluation of QPSK System over Rayleigh Fading Channel.
7. Equalization of Multipath Channel using LMS or RLS Algorithms.
8. Performance Evaluation of RAKE Receiver over Slow Fading Channel.

NOTE: Use Matlab / COM SIM.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

Salient Features of Prohibition of Ragging in Educational Institutional Act 26 of 1997

- Ragging within or outside the college is prohibited.
- Ragging means doing an act which causes or is likely to cause insult or annoyance or fear or apprehension or threat or intimidation or outrage of modesty or injury to a student

Nature of Ragging	Punishment
Teasing, Embarrassing and humiliating	Imprisonment up to 6 months or fine up to Rs. 1,000/- or Both
Assaulting or using criminal force or criminal intimidation	Imprisonment up to 1 year or fine up to Rs. 2,000/- or Both
Wrongfully restraining or confining or causing hurt	Imprisonment up to 2 years or fine up to Rs. 5,000/- or Both
Causing grievous hurt, Kidnapping or rape or committing unnatural offence	Imprisonment up to 5 years or fine up to Rs. 10,000/-
Causing death or abetting suicide	Imprisonment up to 10 years or fine up to Rs. 50,000/-

Note:

1. A student convicted of any of the above offences, will be expelled from the College.
2. A student imprisoned for more than six months for any of the above offences will not be admitted in any other College.
3. A student against whom there is prima facie evidence of ragging in any form will be suspended from the College immediately.
4. The full text of Act 26 of 1997 and UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009 **(Dated 17th June, 2009) are placed in the College library for reference**.

Department of Electronics and Communication Engineering

Course Structure for M. Tech. (VLSI)

M. Tech. – I Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT15701	Analog IC Design	4	-	40	60	100	4
10MT15702	Digital Design Modeling and Synthesis with HDLs	4	-	40	60	100	4
10MT15703	Digital IC Design	4	-	40	60	100	4
10MT15704	Hardware Software Co-Design	4	-	40	60	100	4
10MT15705	VLSI Technology	4	-	40	60	100	4
	Elective-I						
10MT15706	ASIC Design	4	-	40	60	100	4
10MT15707	Embedded System Design						
10MT15708	System Modeling and Simulation						
10MT15709	Digital IC Design Lab.	-	4	25	50	75	2
	Total	**24**	**4**	**265**	**410**	**675**	**26**

M. Tech. – II Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT25701	Algorithms for VLSI Physical Design Automation	4	-	40	60	100	4
10MT25702	CPLD & FPGA Architectures and Applications	4	-	40	60	100	4
10MT25703	Digital System Testing and Testability	4	-	40	60	100	4
10MT25704	Low Power VLSI Design	4	-	40	60	100	4
10MT25705	Scripting Language for VLSI Design Automation	4	-	40	60	100	4
	Elective-II						
10MT25706	Cryptography and Network Security	4	-	40	60	100	4
10MT25707	Nano Electronics						
10MT25708	Real Time Operating Systems						
10MT25709	Industrial Visit/ Seminar	-	-	50	-	50	2
10MT25710	Mixed Signal Lab.	-	4	25	50	75	2
	Total	**24**	**4**	**315**	**410**	**725**	**28**

M. Tech. – III Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT35701	Project Work – Phase I	-	-	50	-	50	4
	Total			**50**	**-**	**50**	**4**

M. Tech. – IV Semester

Subject Code	Name of the Subject	L+T	P	Internal Marks	External Marks	Total Marks	C
10MT45701	Project Work – Phase II	-	-	50	100	150	12
	Total			**50**	**100**	**150**	**12**

Total Marks : 1600
Total Credits: 70

M. Tech. (VLSI)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT15701) ANALOG IC DESIGN

UNIT I
MOS transistors-modeling in linear, saturation and cutoff high frequency equivalent circuit.

UNIT II & III
INTEGRATED DEVICES AND MODELING AND CURRENT MIRROR: Advanced MOS Modeling, Large Signal and Small Signal Modeling for BJT/Basic Current Mirrors and Single Stage Amplifiers: Simple CMOS Current Mirror, Common Source, Common Gate Amplifier With Current Mirror Active Load. Source Follower with Current Mirror to Supply Bias Current, High Output Impedance Current Mirrors and Bipolar Gain Stages. Frequency Response.

UNIT IV
OPERATIONAL AMPLIFIER DESIGN AND COMPENSATION: Two Stage CMOS Operational Amplifier. Feedback and Operational Amplifier Compensation. Advanced Current Mirror. Folded–Cascade Operational Amplifier, Current Mirror Operational Amplifier Fully Differential Operational Amplifier. Common Mode Feedback Circuits. Current Feedback Operational Amplifier. Comparator . Charge Injection Error. Latched Comparator and Bi-CMOS Comparators.

UNIT V
SAMPLE AND HOLD SWITCHED CAPACITOR CIRCUITS-I: MOS, CMOS, Bi-CMOS Sample and Hold Circuits. Switched Capacitor Circuits: Basic Operation and Analysis. First Order and Biquard Filters.

UNIT VI
SAMPLE AND HOLD SWITCHED CAPACITOR CIRCUITS-II: Charge Injection. Switched Capacitor Gain Circuit. Correlated. Double Sampling Techniques. Other Switched Capacitor Circuits.

UNIT VII
DATA CONVERTERS: Ideal D/A & A/D Converters. Quantization Noise. Performance Limitations. Nyquist Rate D/A Converters: Decoders Based Converters. Binary Scaled Converters. Hybrid Converters. Nyquist Rate A/D Converters: Integrating ,Successive Approximation, Cyclic Flash Type, Two Step, Interpolating, Folding and Pipelined, A/D Converters.

UNIT VIII
OVER SAMPLING CONVERTERS AND FILTERS: Over Sampling With and Without Noise Shaping. Digital Decimation Filter. High Order Modulators. Band Pass Over Sampling Converter. Practical Considerations. Continuous Time Filters.

TEXT BOOKS:

1. D.A.John & Ken Martin, "Analog Integrated Circuit Design", John Wiley, 1997.
2. Behzad Razavi, "Design of Analog CMOS Integrated Circuit", Tata-Mc GrawHill, 2002.

REFERENCES:

1. Philip Allen & Douglas Holberg, "CMOS Analog Circuit Design", Oxford University Press, 2002.
2. Gregolian & Temes, "Analog MOS Integrated Circuits", John Wiley, 1986.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (VLSI)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT15702) DIGITAL DESIGN MODELLING AND SYNTHESIS WITH HDLs

UNIT I

HARDWARE MODELING WITH THE VERILOG HDL: Hardware Encapsulation -The Verilog Module, Hardware Modeling Verilog Primitives, Descriptive Styles, Structural Connections, Behavioral Description In Verilog, Hierarchical Descriptions of Hardware, Structured (Top Down) Design Methodology, Arrays of Instances, Using Verilog for Synthesis, Language Conventions, Representation of Numbers.

UNIT II

LOGIC SYSTEM, DATA TYPES AND OPERATORS FOR MODELING IN VERILOG HDL: User-Defined Primitives, User Defined Primitives – Combinational Behavior User-Defined Primitives –Sequential Behavior, Initialization of Sequential Primitives. Verilog Variables, Logic Value Set, Data Types, Strings. Constants, Operators, Expressions and Operands, Operator Precedence Models Of Propagation Delay; Built-In Constructs for Delay, Signal Transitions, Verilog Models for Gate Propagation Delay (Inertial Delay), Time Scales for Simulation, Verilog Models for Net Delay (Transport Delay), Module Paths and Delays, Path Delays and Simulation, Inertial Delay Effects and Pulse Rejection.

UNIT III

BEHAVIORAL DESCRIPTIONS IN VERILOG HDL: Verilog Behaviors, Behavioral Statements, Procedural Assignment, Procedural Continuous Assignments, Procedural Timing Controls and Synchronization, Intra-Assignment, Delay-Blocked Assignments, Non-Blocking Assignment, Intra-Assignment Delay: Non-Blocking Assignment, Simulation of Simultaneous Procedural Assignments, Repeated Intra Assignment Delay, Indeterminate Assignments and Ambiguity, Constructs for Activity Flow Control, Tasks and Functions, Summary of Delay Constructs in Verilog, System Tasks for Timing Checks, Variable Scope Revisited, Module Contents, Behavioral Models of Finite State Machines.

UNIT IV

SYNTHESIS OF COMBINATIONAL LOGIC: HDL-Based Synthesis, Technology-Independent Design, Benefits of Synthesis, Synthesis Methodology, Vendor Support, Styles for Synthesis of Combinational Logic, Technology Mapping and Shared Resources, Three State Buffers, Three State Outputs and Don't Cares, Synthesis of Sequential Logic Synthesis of Sequential Udps, Synthesis of Latches, Synthesis of Edge-Triggered Flip Flops, Registered Combinational Logic, Shift Registers and Counters, Synthesis of Finite State Machines, Resets, Synthesis of Gated Clocks, Design Partitions and Hierarchical Structures.

UNIT V

SYNTHESIS OF LANGUAGE CONSTRUCTS: Synthesis of Nets, Synthesis of Register Variables, Restrictions on Synthesis of "X" and "Z", Synthesis of Expressions and Operators, Synthesis of Assignments, Synthesis of Case and Conditional Statement, Synthesis of Resets, Timings Controls in Synthesis, Synthesis of Multi-Cycle Operations, Synthesis of Loops, Synthesis if Fork Join Blocks, Synthesis of The Disable Statement Synthesis of User-Defined Tasks, Synthesis of User-Defined Functions, Synthesis of Specify Blocks, Synthesis of Compiler Directives.

UNIT VI

SWITCH-LEVEL MODELS IN VERILOG: MOS Transistor Technology, Switch Level Models of MOS Transistors, Switch Level Models of Static CMOS Circuits, Alternative Loads and Pull Gates, CMOS Transmission Gates. Bio-Directional Gates (Switches), Signal Strengths, Ambiguous Signals, Strength Reduction By Primitives, Combination and Resolution of Signal Strengths, Signal Strengths and Wired Logic. Design Examples in Verilog.

UNIT VII

INTRODUCTION TO VHDL: An Overview of Design Procedures used for System Design using CAD Tools. Design Entry. Synthesis, Simulation, Optimization, Place and Route. Design Verification Tools. Examples using Commercial PC Based on VHDL Elements of VHDL Top Down Design with VHDL Subprograms. Controller Description VHDL Operators.

UNIT VIII

BEHAVIORAL DESCRIPTION OF HARDWARE IN VHDL: Process Statement Assertion Statements, Sequential Wait Statements Formatted ASCII I/O Operators, MSI-Based Design. Differences between VHDL and Verilog.

TEXT BOOKS:

1. M.D.Ciletti, "Modeling, Synthesis and Rapid Prototyping with the Verilog HDL", Prentice-Hall, 1999.
2. Z.Nawabi, "VHDL Analysis and Modeling of Digital Systems", McGraw Hill, 2nd edition 1998.

REFERENCES:

1. M.G.Arnold, "Verilog Digital – Computer Design", Prentice-Hall (PTR), 1999.
2. Perry, "VHDL", McGraw Hill, 3rd edition.

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(10MT15703) DIGITAL IC DESIGN

UNIT I
CMOS inverters -static and dynamic characteristics.

UNIT II
Static and Dynamic CMOS design- Domino and NORA logic - combinational and sequential circuits.

UNIT III
Method of Logical Effort for transistor sizing -power consumption in CMOS gates- Low power CMOS design.

UNIT IV
Arithmetic circuits in CMOS VLSI - Adders- multipliers- shifter -CMOS memory design - SRAM and DRAM

UNIT V
Bipolar gate Design- BiCMOS logic - static and dynamic behaviour -Delay and power consumption in BiCMOS Logic.

UNIT VI&VII
LAYOUT DESIGN RULES: Need for Design Rules, Mead Conway Design Rules for the Silicon Gate NMOS Process, CMOS Based Design Rules, Simple Layout Examples, Sheet Resistance, Area Capacitance, Wire Capacitance, Drive Large Capacitive Load**.**

UNIT VIII
SUBSYSTEM DESIGN PROCESS: General arrangement of 4-bit Arithmetic Processor, Design of 4-bit shifter, Design of ALU sub-system, Implementing ALU functions with an adder, Carry-look-ahead adders, Multipliers, Serial Parallel multipliers, Pipeline multiplier array, modified Booth's algorithm.

TEXT BOOKS:
1. Sung-Mo Kang & Yusuf Leblebici, "CMOS Digital Integrated Circuits - Analysis & Design", MGH, 2nd edition, 1999.
2. Jan M Rabaey, "Digital Integrated Circuits - A Design Perspective", Prentice Hall, 1997.
3. Eugene D Fabricus, "Introduction to VLSI Design", McGraw Hill International Edition, 1990.

REFERENCES:
1. Ken Martin, "Digital Integrated Circuit Design", Oxford University Press, 2000.
2. Neil H E West and Kamran Eshranghian, "Principles of CMOS VLSI Design: A System Perspective", Addision-Wesley 2nd Edition, 2002.
3. R. J. Baker, H. W. Li, and D. E. Boyce, "CMOS circuit design, layout and simulation", New York: IEEE Press, 1998.
4. David A. Hodges, Horace G. Jackson, and Resve A. Saleh, "Analysis and Design of Digital Integrated Circuits", McGraw-Hill, 3rd Edition, 2004.

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(10MT15704) HARDWARE SOFTWARE CO- DESIGN

UNIT I
CO- DESIGN ISSUES: Co- Design Models, Architectures, Languages, a Generic Co-design Methodology.

UNIT II
CO- SYNTHESIS ALGORITHMS: Hardware software synthesis algorithms: hardware- software partitioning distributed system co-synthesis.

UNIT III
PROTOTYPING AND EMULATION: Prototyping and emulation techniques, prototyping and emulation environments, future developments in emulation and prototyping architecture specialization techniques, system communication infrastructure

UNIT IV
TARGET ARCHITECTURES: Architecture Specialization techniques, System Communication infrastructure, Target Architecture and Application System classes, Architecture for control dominated systems (8051-Architectures for High performance control), Architecture for Data dominated systems (ADSP21060, TMS320C60), Mixed Systems.

UNIT V
COMPILATION TECHNIQUES AND TOOLS FOR EMBEDDED PROCESSOR ARCHITECTURES: Modern embedded architectures, embedded software development needs, compilation technologies practical consideration in a compiler development environment.

UNIT VI
DESIGN SPECIFICATION AND VERIFICATION: Design, co-design, the co-design computational model, concurrency coordinating concurrent computations, interfacing components, design verification, implementation verification, verification tools, and interface verification

UNIT VII
LANGUAGES FOR SYSTEM- LEVEL SPECIFICATION AND DESIGN-I: System – level specification, design representation for system level synthesis, system level specification languages,

UNIT VIII
LANGUAGES FOR SYSTEM-LEVEL SPECIFICATION AND DESIGN-II: Heterogeneous specifications and multi language co-simulation the cosyma system and lycos system.

TEXT BOOKS:
1. Jorgen Staunstrup, Wayne Wolf, "Hardware / software co- design Principles and Practice", Springer, 2009.
2. "Hardware / software co-design Principles and Practice", kluwer academic publishers, 2002.

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(10MT15705) VLSI TECHNOLOGY

UNIT I
REVIEW OF MICROELECTRONICS AND INTRODUCTION TO MOS TECHNOLOGIES: (MOS, CMOS, Bi-CMOS) Technology Trends and Projections.

UNIT II
BASIC ELECTRICAL PROPERTIES OF MOS, CMOS & BICOMS CIRCUITS: Ids-Vds Relationships, Threshold Voltage Vt, Gm, Gds and Wo, Pass Transistor, MOS,CMOS & Bi- CMOS Inverters, Zpu/Zpd, MOS Transistor Circuit Model, Latch-Up in CMOS Circuits.

UNIT III
LAYOUT DESIGN AND TOOLS: Transistor Structures, Wires and Vias, Scalable Design Rules, Layout Design Tools.

UNIT IV
LOGIC GATES & LAYOUTS: Static Complementary Gates, Switch Logic, Alternative Gate Circuits, Low Power Gates, Resistive and Inductive Interconnect Delays.

UNITV
COMBINATIONAL LOGIC NETWORKS: Layouts, Simulation, Network delay, Interconnect Design, Power Optimization, Switch Logic Networks, Gate and Network Testing.

UNIT VI
SEQUENTIAL SYSTEMS: Memory Cells and Arrays, Clocking Disciplines, Design, Power Optimization, Design Validation and Testing.

UNITVII
FLOOR PLANNING & ARCHITECTURE DESIGN: Floor Planning Methods, Off-Chip Connections, High Level Synthesis, Architecture for Low Power, SOCs and Embedded CPUs, Architecture Testing.

UNIT VIII
INTRODUCTION TO CAD SYSTEMS (ALGORITHMS) AND CHIP DESIGN: Layout Synthesis and Analysis, Scheduling and Printing; Hardware-Software Co-design, Chip Design Methodologies- A simple Design Example.

TEXT BOOKS:

1. K. Eshraghian et. al (3 authors), "Essentials of VLSI Circuits and Systems", PHI of India Ltd., 2005.
2. Wayne Wolf, "Modern VLSI Design", Pearson Education, fifth Indian Reprint, 3rd Edition, 2005.

REFERENCES:

1. N.H.E Weste, K.Eshraghian, "Principals of CMOS Design", Adison Wesley, 2nd Edition.
2. Fabricius, "Introduction to VLSI Design", MGH International Edition, 1990.
3. Baker, Li Boyce, "CMOS Circuit Design, Layout and Simulation", PHI, 2004.

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(10MT15706) ASIC DESIGN
(ELECTIVE I)

UNIT I
ASIC DESIGN STYLES: Introduction – categories-Gate arrays-Standard cells-Cell based ASICs-Mixed mode and analogue ASICs – PLDs.

UNIT II
ASICS – PROGRAMMABLE LOGIC DEVICES: Overview – PAL –based PLDs: Structures; PAL Characteristics – FPGAs: Intoduction, selected families – design outline.

UNIT III
ASICS –DESIGN ISSUES: Design methodologies and design tools – design for testability – economies.

UNIT IV
ACISS CHARACTERISTICS AND PERFORMANCE: design styles, gate arrays, standard cell -based ASICs, Mixed mode and analogue ASICs.

UNIT V
ASICS-DESIGN TECHNIQUES: Overview- Design flow and methodology-Hardware description languages-simulation and checking-commercial design tools- FPGA Design tools: XILINX, ALTERA

UNIT VI
LOGIC SYNTHESIS, SIMULATION AND TESTING: Verilog and logic synthesis -VHDL and logic synthesis - types of simulation -boundary scan test - fault simulation- automatic test pattern generation.

UNIT VII
ASIC CONSTRUCTION: Floor planning, placement and routing system partition.

UNIT VIII
FPGA PARTITIONING: Partitioning Methods-Floor Planning- Placement-Physical Design Flow-Global Routing-Detailed Routing –Special Routing-Circuit Extraction-DRC.

TEXT BOOKS:
1. L.J.Herbst, "Integrated circuit engineering", OXFORD SCIENCE Publications, 1996.

REFERENCES:
1. M.J.S.Smith, "Application - Specific integrated circuits", Addison-Wesley Longman Inc 1997.

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(10MT15707) EMBEDDED SYSTEM DESIGN (ELECTIVE I)

UNIT I

AN INTRODUCTION TO EMBEDDED SYSTEMS: An Embedded System, Processor in The System, Other Hardware Units, Software Embedded into a System, Exemplary Embedded Systems, Embedded System -On-Chip (SOC) and in VLSI Circuit.

UNIT II:

PROCESSOR AND MEMORY ORGANIZATION: Structural Units In a Processor, Processor Selection for an Embedded System, Memory Devices, Memory Selection for an Embedded Systems, Allocation of Memory to Program Cache and Memory Management Links, Segments and Blocks and Memory Map of a System, DMA, Interfacing Processors, Memories and Input Output Devices.

UNIT III

DEVICES AND BUSES FOR DEVICE NETWORKS: I/O Devices, Timer and Counting Devices, Serial Communication Using The "I^2C", CAN, Profibus Foundation Field Bus. and Advanced I/O Buses Between the Network Multiple Devices, Host Systems or Computer Parallel Communication between the Networked I/O Multiple Devices using the ISA, PCI, PCI-X and Advanced Buses.

UNIT IV

DEVICE DRIVERS AND INTERRUPTS SERVICING MECHANISM: Device Drivers, Parallel Port and Serial Port Device Drivers in a System, Device Drivers for Internal Programmable Timing Devices, Interrupt Servicing Mechanism.

UNIT V

INSTRUCTION SETS; Introduction, preliminaries, ARM processor, SHARC processor.

UNIT VI

PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C, C++, VC++ AND JAVA: Interprocess Communication and Synchronization of Processes, Task and Threads, Multiple Processes in an Application, Problem of Sharing Data by Multiple Tasks and Routines, Interprocess Communication.

UNIT VII

HARDWARE–SOFTWARE CO-DESIGN-I: Embedded System Project Management, Embedded System Design and Co-Design Issues in System Development Process, Design Cycle in the Development Phase for an Embedded System.

UNIT VIII

HARDWARE–SOFTWARE CO-DESIGN-II: Use of Target Systems, use of Software Tools for Development of an Embedded System, use of Scopes and Logic Analysis for System, Hardware Tests. Issues in Embedded System Design.

TEXTBOOKS:

1. Rajkamal, "Embedded systems: Architecture, Programming and Design", TMH.
2. Wayne wolf, "Computers as a component: principles of embedded computing system design".

REFERENCES:

1. Arnold S Burger, "Embedded system design", CMP.
2. David Simon, "An embedded software primer", PEA.
3. Steve Heath; Butterworth Heinenann, "Embedded systems design:Real world design", Newton mass USA 2002.
4. Hayt, "Data communication".

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(10MT15708) SYSTEM MODELLING AND SIMULATION (ELECTIVE I)

UNIT I

Basic Simulation Modeling, Systems, Models and Simulation, Discrete Event Simulation, Simulation of Single Server Queuing System, Simulation of Inventory System, Alternative approach to Modeling and Simulation.

UNIT II

SIMULATION SOFTWARE: Comparison of Simulation Packages with Programming Languages, Classification of Software, Desirable Software Features, General Purpose Simulation Packages – Arena, Extend and Others, Object Oriented Simulation, Examples of Application Oriented Simulation Packages.

UNIT III

BUILDING SIMULATION MODELS: Guidelines for Determining Levels of Model Detail, Techniques for Increasing Model Validity and Credibility.

UNIT IV

MODELING TIME DRIVEN SYSTEMS: Modeling Input Signals, Delays, System Integration, Linear Systems, Motion Control Models, Numerical Experimentation.

UNIT V

EXOGENOUS SIGNALS AND EVENTS: Disturbance Signals, State Machines, Petri Nets & Analysis, System Encapsulation.

UNIT VI

MARKOV PROCESS: Probabilistic Systems, Discrete Time Markov Processes, Random Walks, Poisson Processes, the Exponential Distribution, Simulating a Poison Process, Continuous-Time Markov Processes.

UNIT VII

EVENT DRIVEN MODELS: Simulation Diagrams, Queuing Theory, Simulating Queuing Systems, Types of Queues, Multiple Servers.

UNIT VIII

SYSTEM OPTIMIZATION: System Identification, Searches, Alpha/Beta Trackers, Multidimensional Optimization, Modeling and Simulation Mythology.

TEXT BOOKS:

1. Frank L. Severance, "System Modeling & Simulation, an Introduction", John Wiley & Sons, 2001.
2. Averill M. Law, W. David Kelton, "Simulation Modeling and Analysis", TMH, 3rd Edition, 2003.

REFRENCES:

1. Geoffery Gordon, "Systems Simulation", PHI, 1978.

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(10MT15709) DIGITAL IC DESIGN LABORATORY

- Digital Circuits Description using Verilog and VHDL.
- Verification of the Functionality of Designed circuits using function Simulator.
- Timing Simulation for critical path time calculation.
- Synthesis of Digital circuits.
- Place and Route techniques for major FPGA vendors such as Xilinx, Altera and Actel etc.
- Implementation of Designed Digital Circuits using FPGA and CPLD devices.

NOTE: Required Software Tools:

- Mentor Graphic tools / Cadence tools/ Synopsis tools. (220 nm Technology and Above)
- Xilinx 9.1i and Above for FPGA/CPLDS / FPGA Advantage.

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(10MT25701) ALGORITHMS FOR VLSI PHYSICAL DESIGN AUTOMATION

UNIT I
PRELIMINARIES: Introduction to Design Methodologies, Design Automation tools, Algorithmic Graph Theory, Computational complexity, Tractable and Intractable problems.

UNIT II
GENERAL PURPOSE METHODS FOR COMBINATIONAL OPTIMIZATION: Backtracking, Branch and Bound, Dynamic Programming, Integer Linear Programming, Local Search, Simulated Annealing, Tabu search, Genetic Algorithms.

UNIT III
Layout Compaction, Placement, Floor planning And Routing Problems, Concepts and Algorithms.

UNIT IV
MODELLING AND SIMULATION: Gate Level Modeling and Simulation, Switch level Modeling and Simulation.

UNIT V
LOGIC SYNTHESIS AND VERIFICATION: Basic issues and Terminology, Binary-Decision diagrams, Two-Level logic Synthesis

UNIT VI
HIGH-LEVEL SYNTHESIS: Hardware Models, Internal representation of the input Algorithm, Allocation, Assignment and Scheduling, Some Scheduling Algorithms, Some aspects of Assignment problem, High-level Transformations.

UNIT VII
PHYSICAL DESIGN AUTOMATION OF FPGA'S: FPGA technologies, Physical Design cycle for FPGA's, partitioning and Routing for segmented and staggered Models.

UNIT VIII
PHYSICAL DESIGN AUTOMATION OF MCM'S: MCM technologies, MCM physical design cycle, Partitioning, Placement- Chip Array based and Full Custom Approaches, Routing, Maze routing, Multiple stage routing, Topologic routing, Integrated Pin, Distribution and routing, Routing and Programmable MCM's.

TEXTBOOKS:
1. S.H.Gerez, "Algorithms for VLSI Design Automation", WILEY Student Edition, John wiley & Sons (Asia) Pvt. Ltd., 1999.
2. Naveed Sherwani, "Algorithms for VLSI Physical Design Automation", Springer International Edition, 3rd edition, 2005.

REFERENCES:

1. Hill & Peterson, "Computer Aided Logical Design with Emphasis on VLSI", Wiley, 1993.
2. Wayne Wolf, "Modern VLSI Design Systems on silicon", Pearson Education Asia, 2nd Edition, 1998.

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(10MT25702) CPLD AND FPGA ARCHITECTURE AND APPLICATIONS

UNIT I

PROGRAMMABLE LOGIC: ROM, PLA, PAL, PLD, PGA – Features, Programming and Applications using Complex Programmable Logic Devices Altera Series – Max 5000/7000 Series and Altera FLEX Logic – 10000 Series CPLD, AMD's – CPLD (Mach 1 To 5); Cypres FLASH 370 Device Technology, Lattice Plsi's Architectures – 3000 Series – Speed Performance and in System Programmability.

UNIT II

FPGA: Field Programmable Gate Arrays – Logic Blocks, Routing Architecture, Design Flow, Technology Mapping J for Fpgas.

UNIT III

CASE STUDIES: Xilinx XC4000 & ALTERA's FLEX 8000/10000 FPGAs: AT & T– ORCA's (Optimized Reconfigurable Cell Array): ACTEL's – ACT-1,2,3 and Their Speed Performance.

UNIT IV

FINITE STATE MACHINES (FSM): Top Down Design – State Transition Table, State Assignments for FPGAs. Problem of Initial State Assignment for One Hot Encoding. Derivations of State Machine Charges.

UNIT V

REALIZATION OF STATE MACHINE: Charts with a PAL. Alternative Realization for State Machine Chart using Microprogramming. Linked State Machines. One – Hot State Machine, Petrinetes for State Machines – Basic Concepts, Properties. Extended Petrinetes for Parallel Controllers. Finite State Machine – Case Study, Meta Stability, Synchronization.

UNIT VI& VII

FSM ARCHITECTURES AND SYSTEMS LEVEL DESIGN: Architectures Centered Around Non-Registered PLDs. State Machine Designs Centered Around Shift Registers. One – Hot Design Method. Use of ASMs in One – Hot Design. K Application of One – Hot Method. System Level Design – Controller, Data Path and Functional Partition.

UNIT VIII

DIGITAL FRONT END DIGITAL DESIGN TOOLS FOR FPGAS & ASICS: Using Mentor Graphics EDA Tool ("FPGA Advantage") – Design Flow Using FPGAs – Guidelines and Case Studies of Paraller Adder Cell, Paraller Adder Sequential Circuits, Counters, Multiplexers, Parallel Controllers.

TEXT BOOKS/ REFERENCES:

1. P.K.Chan & S. Mourad, "Digital Design Using Field Programmable Gate Array", Prentice Hall (Pte), 1994.
2. S.Trimberger, Edr., "Field Programmable Gate Array Technology", Kluwer Academic Publications,1994.
3. J. Old Field, R.Dorf, "Field Programmable Gate Arrays", John Wiley & Sons, Newyork, 1995.
4. S.Brown, R.Francis, J.Rose, Z.Vransic, "Field Programmable Gate Array", Kluwer Publication, 1992.

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(10MT25703) DIGITAL SYSTEM TESTING AND TESTABILITY

UNIT I
INTRODUCTION TO TEST AND DESIGN FOR TESTABILITY (DFT) FUNDAMENTALS: Modeling: Modeling Digital Circuits at Logic Level, Register Level and Structural Models. Levels of Modeling. Logic Simulation: Types of Simulation, Delay Models, Element Evaluation, Hazard Detection, Gate Level Event Driven Simulation.

UNIT II
FAULT MODELING: Logic Fault Models, Fault Detection and Redundancy, Fault Equivalence and Fault Location. Single Stuck and Multiple Stuck – Fault Models. Fault Simulation Applications, General Techniques for Combinational Circuits.

UNIT III
TESTING FOR SINGLE STUCK FAULTS (SSF): Automated Test Pattern Generation (ATPG/ATG) For Ssfs In Combinational and Sequential Circuits, Functional Testing With Specific Fault Models. Vector Simulation – ATPG Vectors, Formats, Compaction and Compression, Selecting ATPG Tool.

UNIT IV&V
DESIGN FOR TESTABILITY: Testability Trade-Offs, Techniques. Scan Architectures and Testing – Controllability and Absorbability, Generic Boundary Scan, Full Integrated Scan, Storage Cells for Scan Design. Board Level and System Level DFT Approaches. Boundary Scans Standards. Compression Techniques – Different Techniques, Syndrome Test and Signature Analysis.

UNIT VI
BUILT-IN SELF-TEST (BIST): BIST Concepts and Test Pattern Generation. Specific BIST Architectures – CSBL, BEST, RTS, LOCST, STUMPS, CBIST, CEBS, RTD, SST, CATS, CSTP, BILBO. Brief Ideas on Some Advanced BIST Concepts and Design for Self-Test at Board Level.

UNIT VII
MEMORY BIST (MBIST): Memory Test Architectures and Techniques – Introduction to Memory Test, Types of Memories and Integration, Embedded Memory Testing Model. Memory Test Requirements for MBIST.

UNIT VIII
BRIEF IDEAS ON EMBEDDED CORE TESTING: Introduction to Automatic in Circuit Testing (ICT), JTAG Testing Features.

TEXT BOOKS:
1. Miron Abramovici, Melvin A. Breur, Arthur D.Friedman, "Digital Systems Testing and Testable Design", Jaico Publishing House, 2001.

REFERENCES:

1. Alfred Crouch, "Design for Test for Digital ICs & Embedded Core Systems", Prentice Hall.
2. Robert J.Feugate, Jr., Steven M.Mentyn, "Introduction to VLSI Testing", Prentice Hall, Englehood Cliffs, 1998.

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(10MT25704) LOW POWER VLSI DESIGN

UNIT I
LOW POWER DESIGN, AN OVER VIEW: Introduction to low- voltage low power design, limitations, Silicon-on-Insulator.

UNIT II
MOS/BiCMOS PROCESSES: Bi-CMOS processes, Integration and Isolation considerations, Integrated Analog/Digital CMOS Process.

UNIT III
LOW-VOLTAGE/LOW POWER CMOS/ BICMOS PROCESSES: Deep submicron processes, SOI CMOS, lateral BJT on SOI, future trends and directions of CMOS/Bi-CMOS processes.

UNIT IV
DEVICE BEHAVIOR AND MODELING: Advanced MOSFET models, limitations of MOSFET models, Bipolar models. Analytical and Experimental characterization of sub-half micron MOS devices, MOSFET in a Hybrid mode environment.

UNIT V
CMOS AND Bi-CMOS LOGIC GATES: Conventional CMOS and Bi-CMOS logic gates, Performance Evaluation.

UNIT VI
LOW- VOLTAGE LOW POWER LOGIC CIRCUITS: Comparison of advanced Bi-CMOS Digital circuits. ESD-free Bi-CMOS, Digital circuit operation and comparative Evaluation.

UNIT VII
LOW POWER LATCHES AND FLIP FLOPS: Evolution of Latches and Flip flops-quality measures for latches and Flip flops, Design perspective.

UNIT VIII
SPECIAL TECHNIQUES: Power Reduction in Clock Networks, CMOS Floating Node,Low Power Bus, Delay Balancing, Low Power Techniques for SRAM.

TEXT BOOKS:
1. Yeo Rofail/ Gohl (3 Authors), "CMOS/BiCMOS ULSI low voltage, low power", Pearson Education Asia 1st Indian reprint, 2002.
2. Gary K. Yeap, "Practical Low Power Digital VLSI Design", KAP, 2002.

REFERENCES:
1. Douglas A.Pucknell & Kamran Eshraghian, "Basic VLSI Design", PHI, 3rd edition.
2. J.Rabaey, "Digital Integrated circuits", PH, 1996.
3. Sung-mo Kang and yusuf leblebici, "CMOS Digital ICs", TMH, 3rd edition 2003.
4. IEEE Trans Electron Devices, IEEE J. Solid State Circuits, and other National and International Conferences and Symposia.

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(10MT25705) SCRIPTING LANGUAGE FOR VLSI DESIGN AUTOMATION

UNIT I
Overview of Scripting Languages – PERL, CGI, VB Script, Java Script.

UNIT II&III
PERL: Operators, Statements Pattern Matching etc. Data Structures, Modules, Objects, Tied Variables.

UNIT IV&V
Inter process Communication Threads, Compilation & Line Interfacing.

UNIT VI&VII
Debugger Internal & Externals Portable Functions. Extensive Exercises for Programming in PERL.

UNIT VIII
Other Languages: Broad Details of CGI, VB Script, Java Script with Programming Examples.

TEXT BOOKS:

1. Randal L, Schwartz Tom Phoenix, "Learning PERL", Oreilly Publications, 3rd edition, 2000.
2. Larry Wall, Tom Christiansen, John Orwant, "Programming PERL", Oreilly Publications, 3rd edition, 2000.
3. Tom Christiansen, Nathan Torkington, "PERL Cookbook", Oreilly Publications, 3rd edition, 2000.

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(10MT25706) CRYPTOGRAPHY AND NETWORK SECURITY (ELECTIVE II)

UNIT I

SYMMETRIC CIPHERS: Overview – classical Encryption Techniques, Block Ciphers and the Data Encryption standard, Introduction to Finite Fields, Advanced Encryption standard, Contemporary Symmetric Ciphers, Confidentiality using Symmetric Encryption.

UNIT II

PUBLIC-KEY ENCRYPTION AND HASH FUNCTIONS: Introduction to Number Theory, Public-Key Cryptography and RSA, Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography, Message Authentication and Hash Functions, Hash Algorithms, Digital Signatures and Authentication Protocols.

UNIT III

NETWORK SECURITY PRACTICE: Authentication Applications, Kerbors, X.509 Authentication Service, Electronic mail Security, Pretty Good Privacy, S/MIME, IP Security architecture, Authentication Header, Encapsulating Security Payload, Key Management.

UNIT IV

SYSTEM SECURITY: Intruders, Intrusion Detection, Password Management, Malicious Software, Firewalls, Firewall Design Principles, Trusted Systems.

UNIT V

WIRELESS SECURITY: Introduction to Wireless LAN Security Standards, Wireless LAN Security Factors and Issues.

UNIT VI

SECURE NETWORKING THREATS: Attack Process, Attacker Types. Vulnerability Types, Attack Results, Attack Taxonomy, Threats to Security, Physical security, Biometric systems, monitoring controls, Data security, intrusion, detection systems.

UNIT VII

ENCRYPTION TECHNIQUES: Conventional techniques, Modern techniques, DES, DES chaining, Triple DES, RSA algorithm, Key management, Message Authentication, Hash Algorithm, Authentication requirements, functions secure Hash Algorithm, Message digest algorithm, digital signatures, AES Algorithms.

UNIT VIII

DESIGNING SECURE NETWORKS: Components of a Hardening Strategy, Network Devices, Host Operating Systems, Applications, Based Network Services, Rogue Device Detection, Network Security Technologies, the Difficulties of Secure Networking, Security Technologies, Emerging Security Technologies General Design Considerations, Layer 2 Security, Considerations, IP Addressing Design Considerations - ICMP Design Considerations, Routing Considerations, Transport Protocol Design Considerations.

TEXT BOOKS:

1. William Stallings, "Cryptography and Network Security – Principles and Practices", Pearson Education, 3rd edition, 2003.
2. Sean Convery, "Network Security Architectures", Published by Cisco Press, 1st edition, 2004.

REFERENCES:

1. Atul Kahate, "Cryptography and Network Security", Tata McGraw Hill, 2003.
2. Bruce Schneier, "Applied Cryptography", John Wiley and Sons Inc, 2001.
3. Stewart S. Miller, "Wi-Fi Security", McGraw Hill, 2003.
4. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security In Computing", Pearson Education, 3rd edition, 2003.
5. Jeff Crume, "Inside Internet Security", Addison Wesley, 2005.

M. Tech. (VLSI)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT25707) NANO ELECTRONICS
(ELECTIVE II)

UNIT I

TECHNOLOGY AND ANALYSIS: Film Deposition Methods, Lithography, Material Removing Technologies, Etching and Chemical, Mechanical Processing, Scanning Probe Techniques.

UNIT II

CARBON NANO STRUCTURES: Carbon Clusters, Carbon Nano tubes, Fabrication, Electrical, Mechanical and Vibrational Properties, Applications of Carbon Nano Tubes.

UNIT III

LOGIC DEVICES: Silicon MOSFETS, Novel Materials and Alternative Concepts, Ferro Electric Filed Effect Transistors, Super Conductor Digital Electronics, Carbon Nano Tubes for Data Processing.

UNIT IV

RADOM ACESS MEMORIES: High Permitivity Materials for DRAMs, Ferro Electric Random Access Memories, Magneto-Resistive RAM.

UNIT V&VI

MASS STORAGE DEVICES:

Hard Disk Drives, Magneto Optical Disks, Rewriteable DVDs based on Phase Change Materials, Holographic Data Storage.

UNIT VII&VIII

DATA TRANSIMISSION, INTERFACES AND DISPLAYS:

Photonic Networks, Microwave Communication Systems, Liquid Crystal Displays, Organic Light Emitting Diodes.

TEXTBOOKS:

1. Rainer Waser, "Nano Electronics and Information Technology", Wiley VCH, April 2003.
2. Charles Poole, "Introduction to Nano Technology", Wiley Interscience, May 2003.

M. Tech. (VLSI)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT25708) REAL TIME OPERATING SYSTEMS (ELECTIVE II)

UNIT I

INTRODUCTION TO UNIX: Overview Of Commands, File I/O. (Open, Create, Close, Lseek, Read, Write), Process Control (Fork, Vfork, Exit, Wait, Waitpid, Exec), Signals, Inter Process Communication (Pipes, FIFOs, Message Queues, Semaphores, Shared Memory).

UNIT II&III

REAL TIME SYSTEMS: Typical Real Time Application, Hard Vs Soft Real Time Systems, a Reference Model of Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency Functional Parameters, Resource Parameters of Jobs and Parameters of Resources

UNIT IV

APPROACHES TO REAL TIME SCHEDULING: Clock Driven, Weighted Round Robin, Priority Driven, Dynamic Vs State Systems, Effective Release Times and Dead Lines, Offline Vs Online Scheduling.

UNIT V

OPERATING SYSTEMS: Overview, Time Services and Scheduling Mechanisms, other Basic Operating System Function, Processor Reserves and Resource Kernel. Capabilities of Commercial Real Time Operating Systems.

UNIT VI

FAULT TOLERANCE TECHNIQUES: Introduction, Fault Causes, Types, Detection, Fault and Error Containment, Redundancy: Hardware, Software, Time. Integrated Failure Handling.

UNIT VII

CASE STUDIES-VX WORKS: Memory Managements Task State Transition Diagram, Pre-Emptive Priority, Scheduling, Context Switches – Semaphore – Binary Mutex, Counting: Watch Dugs, I/O System

UNIT VIII

RT Linux: Process Management, Scheduling, Interrupt Management, and Synchronization

TEXT BOOKS:

1. Richard Stevens, "Advanced Unix Programming".
2. Jane W.S. Liu, "Real Time Systems", Pearson Education.
3. C.M.Krishna, KANG G. Shin, "Real Time Systems", McGraw Hill.

REFERENCES:

1. VxWorks Programmers Guide
2. www.tidp.org
3. www.kernel.org
4. http://www.xml.com/ldd/chapter/book

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (VLSI)	L	T	P	C
II SEMESTER	-	-	4	2

(10MT25710) MIXED SIGNAL LABORATORY

1. Analog Circuits Simulation using Spice.
2. Mixed Signal Simulation Using Mixed Signal Simulators.
3. Layout Extraction for Analog & Mixed Signal Circuits.
4. Parasitic Values Estimation from Layout.
5. Layout Vs Schematic.
6. Net List Extraction.
7. Design Rule Checks.

NOTE: Required Software Tools:

1. Mentor Graphic tools / Cadance tools / Synophysis tools. (220 nm Technology and Above)
2. Xilinx 9.1i and Above for FPGA/CPLDS.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, Tirupati – 517 102

COURSE STRUCTURE (2011-12)
M. Tech. I – Semester

COMMUNICATION SYSTEMS (CMS)

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10MT16101	Advanced Mathematics for Communication Systems	4	-	-	4	40	60	100
10MT16102	Modern Digital Communication Techniques	4	-	-	4	40	60	100
10MT23803	Detection and Estimation of Signals	4	-	-	4	40	60	100
10MT16104	Computer Communication Networks	4	-	-	4	40	60	100
10MT16105	Information and Coding Techniques	4	-	-	4	40	60	100
	Elective-I							
10MT16106	Digital Voice & Picture Communication	4	-	-	4	40	60	100
10MT16107	Mobile Ad-hoc Networks							
10MT16108	Radar Signal Processing							
10MT16109	Communication Lab-I	-	-	4	2	25	50	75
	Total	**24**	**-**	**4**	**26**	**265**	**410**	**675**

M. Tech. – II Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10MT23805	Wireless Communications	4	-	-	4	40	60	100
10MT26102	Digital Satellite Communications	4	-	-	4	40	60	100
10MT23801	Adaptive Signal Processing	4	-	-	4	40	60	100
10MT23808	Optical Communications	4	-	-	4	40	60	100
10MT26105	RF Systems and Circuits	4	-	-	4	40	60	100
	Elective-II							
10MT26106	MIMO Communication Systems	4	-	-	4	40	60	100
10MT26107	Secure Communication							
10MT23807	Image Processing							
10MT26109	Industrial Visit / Seminar	-	-	-	2	50	-	50
10MT26110	Communication Lab-II	-	-	4	2	25	50	75
	Total	**24**	**-**	**4**	**28**	**315**	**410**	**725**

M. Tech. – III Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10MT36101	Project Work – Phase I	-	-	-	4	50	-	50
	Total	**-**	**-**	**-**	**4**	**50**	**-**	**50**

M. Tech. – IV Semester

Code	Subject	Periods per week			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10MT46101	Project Work – Phase II	-	-	-	12	50	100	150
	Total	**-**	**-**	**-**	**12**	**50**	**100**	**150**

Total Marks : 1600
Total Credits: 70

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16101) ADVANCED MATHEMATICS FOR COMMUNICATION SYSTEMS

UNIT I: RANDOM VARIABLES
Probability axioms, conditional probability, discrete and continuous random variables, cumulative distribution function (CDF), probability mass function (PMF), probability density function (PDF), conditional PMF/PDF, expected value, variance, functions of a random variable, Expected value of the derived random variable.

UNIT II: MULTIPLE RANDOM VARIABLES
Multiple random variables, joint CDF/PMF/PDF, functions of multiple random variables, multiple functions of multiple random variables, independent/uncorrelated random variables, sums of random variables, moment generating function, random sums of random variables.

UNIT III: FUNDAMENTAL THEOREMS
The sample means, laws of large numbers, central limit theorem, Confidence intervals, convergence of sequence of random variables, long Term Arrival Rates and Associated Averages.

UNIT IV: RANDOM PROCESSES
Definition of random processes, specifying random processes, Examples of Discrete-time Random Processes, Examples of Continuous-time Random Processes, Stationary Random Processes, Continuity, Derivatives, and Integrals of random Processes.

UNIT V
Time Averages of Random Processes and ergodic Theorems, Fourier series and karhunen-Loeve Expansion, Power Spectral Density, Response of linear Systems to Random Signals, Amplitude Modulation by Random Signals, Optimum Linear Systems, and Estimating the Power Spectral Density.

UNIT VI
RESPONSE OF PROCESSES TO LTI SYSTEMS: Mean and correlation of random processes, stationary, wide sense stationary and ergodic processes. Random processes as inputs to linear time invariant systems: power spectral density, Gaussian processes as inputs to LTI systems, white Gaussian noise, In-Phase and quadrature representation of random processes.

UNIT VII

MARKOV CHAINS: Markov processes, discrete-time markov chains, continuous -time markov chains, Classes of States, Recurrence Properties, and Limiting probabilities, Time –Reserved markov chains.

UNIT VIII

QUEUEING THEORY: The elements of a Queueing Theory, little's formula, The M/M/I Queue, Multi-Server Systems: M/M/c, M/M/c/c, M/M/8, Finite-Source queueing Systems, M/G/I Queueing Systems, M /G/I Analysis Using Embedded markov chains, Burke's Theorem: Departures from M/M/c Systems, Networks of Queues: Jackson's Theorem.

TEXT BOOKS:

1. Albert Leon Garcia, *Probability and Random Processes for Electrical Engineering,* Prentice Hall, 1993.
2. A. Papoulis and S. U. Pillai, *Probability, Random Variables and Stochastic Processes,* 4th Edition, McGraw Hill, 2002.

REFERENCE BOOKS:

1. Yannis Viniotis, *Probability and Random Processes for Electrical Engineers,* McGraw-Hill College, 1998.
2. V. Krishnan, *Probability and Random Processes,* John Wiley & Sons 2006.
3. Geoffrey Grimmett, *Probability and Random Processes,* 3rd Edition, Oxford University Press, 2001.
4. Henry Stark and John W. Woods, *Probability and Random Processes with Applications to Signal Processing,* 3rd Edition, Prentice Hall, 2001.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16102) MODERN DIGITAL COMMUNICATION TECHNIQUES

UNIT I: FUNDAMENTALS OF SIGNAL PROCESSING
Linear system analysis- impulse response, transfer functions and their relations, time domain and frequency domain analysis of linear systems with random inputs, system and signal bandwidth, narrow band Gaussian noise, filtering of modulated signals, non-linear processing, Optimum filtering- Wiener filters, Matched filters.

UNIT II: CHARACTERIZATION OF COMMUNICATION SIGNALS AND SYSTEMS
Representation of Band Pass Signals and Systems, Signal Space Representation, Representation of digitally modulated signals, Spectral Characteristics of Digitally Modulated signals.

UNIT III: DIGITAL MODULATION TECHNIQUES
Factors that Influencing digital modulation techniques, Linear Modulation Techniques – BPSK, DPSK, QPSK, OQPSK, Pi/4 QPSK, Constant envelope Modulation techniques - MSK, GMSK, Linear and constant envelope modulation techniques – M-ary PSK, M- ary QAM.

UNIT IV: COMMUNICATION OVER ADDITIVE GAUSSIAN NOISE CHANNELS
Optimum receiver for signals corrupted by (AWGN), Performance of the optimum Receiver for Memory less Modulation, Optimum Receiver for CPM signals, Optimum Receiver for Signals With Random Phase in AWGN Channel.

UNIT V: COMMUNICATION THROUGH BAND LIMITED LINEAR FILTER CHANNEL
Optimum Receiver for Channels with ISI and AWGN, Linear Equalization and its Variations, Decision Feedback Equalization.

UNIT VI: FUNDAMENTALS OF SPREAD SPECTRUM
General concepts, types of spread spectrum signals, analysis of direct sequence, spread spectrum systems- classification of sequences, properties of M-sequences, partial co-relation, spreading & dispreading of PN signals, interference rejection, output signal to noise ratio, antijam characteristics, energy and bandwidth efficiency.

UNIT VII: GENERATION OF SPREAD SPECTRUM SIGNALS
Shift register sequence generators, discrete frequency synthesizers, generation of gold sequences and their correlation properties, generation of OVSF codes and their properties.

UNIT VIII: SYNCHRONIZATION OF SPREAD SPECTRUM SYSTEMS
Coherent Direct-Sequence Receivers, Carrier Tracking- Coherent & Non Coherent, Delay-Lock Loop Analysis, Tau-Dither Loop, Acquisition of Spread-Spectrum Signals, and Matched filters for PN Sequences, Applications of spread spectrum signals to communications, multiple access considerations.

TEXT BOOKS:

1. George R. Cooper & Clare D. McGillem, *MODERN COMMUNICATIONS AND SPREAD SPECTRUM,* McGraw-Hill Book Company, 1986.
2. John G. Proakis, *DIGITAL COMMUNICATIONS,* 3rd Edition, McGraw Hill, 1995.

REFERENCE BOOKS:

1. Dr.Kamilo Feher, *WIRELESS DIGITAL COMMUNICATIONS, modulation & spread spectrum applications,* PHI, 1999.
2. Bernard Sklar, *DIGITAL COMMUNICATION, fundamentals and applications,* 2nd Edition Pearson Education.
3. THEODORE S.RAPPAPORT, *Wireless Communications,* 2nd Edition, Pearson Education, 2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT23803) DETECTION AND ESTIMATION OF SIGNALS

UNIT I: DETECTION THEORY
Binary decisions - Single observation- Maximum likelihood decision criterion, Neymann-Pearson criterion, Probability of error criterion, Bayes risk criterion, Mini max criterion, Robust detection, Receiver operating characteristics.

UNIT II&III: BINARY DECISIONS - MULTIPLE OBSERVATIONS
Vector observations, the general Gaussian Problem, Waveform Observation in Additive Gaussian Noise, The Integrating Optimum Receiver; Matched Filter Receiver.

UNIT IV&V: ESTIMATION THEORY
Methods -Maximum likelihood estimation; Bayes cost method Bayes estimation criterion - Mean square error criterion; Uniform cost function; absolute value cost function; Linear minimum variance - Least squares method; Estimation in the presence of Gaussian noise - Linear observation; Non-linear estimation.

UNIT VI: PROPERTIES OF ESTIMATORS
Bias, Efficiency, Cramer Rao bound Asymptotic properties, Sensitivity and error analysis.

UNIT VII: STATE ESTIMATION
Prediction, Kalman filter.

UNIT VIII: SUFFICIENT STATISTICS AND STATISTICAL ESTIMATION OF PARAMETERS
Concept of sufficient statistics, Exponential families of Distributions, Exponential families and Maximum likelihood estimation, uniformly minimum variance unbiased estimation.

TEXT BOOKS:

1. James L. Melsa and David L. Cohn, *Decision and Estimation Theory,* McGraw Hill, 1978.
2. Dimitri Kazakos, P. Papantoni Kazakos, *Detection and Estimation,* Computer Science Press, 1990.
3. Steven M. Kay, *Statistical Signal Processing: Vol. 1: Estimation Theory, Vol. 2: Detection Theory,* Prentice Hall Inc., 1998.

REFERENCE BOOKS:

1. Harry L. Van Trees, *Detection, Estimation and Modulation Theory, Part 1,* John Wiley & Sons Inc., 1968.
2. Jerry M. Mendel, *Lessons in Estimation Theory for Signal Processing, Communication and Control,* Prentice Hall Inc., 1995.
3. Sophocles J. Orfanidis, *Optimum Signal Processing,* 2nd Edition, McGraw Hill, 1988.
4. Monson H. Hayes, *Statistical Digital Signal Processing and Modeling,* John Wiley & Sons Inc., 1996.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16104) COMPUTER COMMUNICATION NETWORKS

UNIT I:
What is the Internet, The Network Edge, The Network Core, Network Access and physical media, ISPs and Internet Backbones, Delay and Loss in Packet-Switched networks, history of computer networking and the internet.

UNIT II: APPLICATION LAYER
Principles of application layer protocols, the web and HTTP, File transfer - FTP, Electronic mail in the internet, DNS- the internet's directory service, Socket programming with TCP, Socket programming with UDP, Building a simple web server, content distribution.

UNIT III: TRANSPORT LAYER
Introduction and transport layer services, multiplexing and de-multiplexing, Connectionless transport - UDP, principles of reliable data transfer, connection-oriented transport: TCP, principles of congestion control, TCP congestion control.

UNIT IV: NETWORK LAYER AND ROUTING
Introduction and network service models, routing principles, hierarchical routing, the internet protocol, routing in the internet, what's inside a router, IPv6, multicast routing, mobility and the network layer.

UNIT V: LINK LAYER AND LOCAL AREA NETWORKS
Data link layer: Introduction and services, error-detection and correction techniques, multiple access protocols, LAN addresses and ARP, Ethernet, hubs, bridges, and switches, wireless links.
PPP: the point to point protocol, asynchronous transfer mode, frame relay.

UNIT VI: MULTIMEDIA NETWORKING
Multimedia networking applications, streaming stored audio and video, making the best of the best-effort service, protocols for real-time interactive applications, beyond best-effort, scheduling and policing mechanism, integrated services, RSVP, differentiated services.

UNIT VII: SECURITY IN COMPUTER NETWORKS
What is network security, principles of cryptography, authentication, integrity, key distribution and certification, access control: firewalls, attacks and countermeasures, security in many layers: case studies.

UNIT VIII: NETWORK MANAGEMENT

What is network management, the infrastructure for network management, the internet standard management framework, SAN.1.

TEXT BOOKS:

1. James. F. Kurose and Keith. W. Ross, *Computer Networks: A top-down approach featuring the Internet,* 3rd Edition, Addison Wesley publications, 2004.
2. D. Bertsekas and R. Gallager, *Data Networks,* 2nd Edition, Prentice Hall of India, 2000.

REFERENCE BOOKS:

1. S. Keshav, *An Engineering Approach to Computer Networking,* Addison Wesley publications, 2001.
2. L. L. Peterson & B. S. Davie, *Computer Networks: A System Approach,* 4th Edition, Morgan Kaufman publishers.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16105) INFORMATION AND CODING TECHNIQUES

UNIT I: INTRODUCTION

Entropy: Memory less sources- Markov sources- Entropy of a discrete Random variable- Joint, conditional and relative entropy- Mutual Information and conditional mutual information. Chain relation for entropy, relative entropy and mutual Information.

Loss less Source coding: Uniquely decodable codes- Instantaneous codes- Kraft's inequality - Optimal codes- Huffman code- Shannon's Source Coding Theorem.

UNIT II:

Asymptotic Equipartition Property (AEP) - High probability sets and typical sets- Method of typical sequence as a combinatorial approach for bounding error probabilities.

Channel Capacity- Capacity computation for some simple channels

UNIT III: CODING THEOREMS

Arimoto-Blahut algorithm- Fano's inequality-Proof of Shannon's Channel Coding Theorem and its converse. Differential Entropy- Joint, relative and conditional differential entropy- Mutual information.

UNIT IV:

Mutual information and Capacity calculation for Band limited Gaussian channels- Shannon limit- Parallel Gaussian Channels-Capacity of channels with colored Gaussian noise.

UNIT V: RATE DISTORTION THEORY

Introduction - Rate Distortion Function - Properties - Continuous Sources and Rate Distortion measure.

Rate Distortion Theorem - Converse - Information Transmission Theorem - Rate Distortion Optimization.

UNIT VI: CHANNEL CODING-1

Waveform Coding, Types of Error Control, Structured Sequences, Linear Block Codes, Error-Detecting and Correcting Capability, Usefulness of the Standard Array, Cyclic Codes, Well-Known Block Codes.

UNIT VII: CHANNEL CODING-2

Convolutional Encoding, Convolutional Encoder Representation, Formulation of the Convolutional Decoding Problem, Properties of Convolutional Codes, Other Convolutional Decoding Algorithms.

UNIT VIII: CHANNEL CODING-3

Reed-Solomon Codes, Interleaving and Concatenated Codes, Coding and Interleaving Applied to the Compact Disc Digital Audio System, Turbo Codes.

TEXT BOOKS:

1. Robert Gallager, *Information Theory and Reliable Communication,* John Wiley & Sons.
2. Bernard sklar, *Digital Communications: Fundamentals and Applications,* 2nd Edition, Pearson Education.
3. R. J. McEliece, *The Theory of Information & Coding,* Addison Wesley Publishing Co., 1977.

REFERENCE BOOKS:

1. *Special Issue on Rate Distortion Theory,* IEEE Signal Processing Magazine, November 1998.
2. Thomas M. Cover and Joy A. Thomas, *Elements of Information Theory,* John Wiley & Sons, 2006.
3. David J. C. MacKay, *Information Theory, Inference and Learning Algorithms,* Cambridge University Press, 2003.
4. T. Bergu, *Rate Distortion Theory A Mathematical Basis for Data Compression,* PH Inc. 1971.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16106) DIGITAL VOICE & PICTURE COMMUNICATION
(Elective - I)

UNIT I: INTRODUCTION
Digital Coding of Waveforms, Subjective quality, Bit rate and coder complexity, Information theoretical limits.

UNIT II: WAVEFORM CHARACTERIZATION
Characteristics of Speech and Image waveforms, Mathematics of Random Waveforms, Model sources with special Correlations and Spectra.

UNIT III: QUANTIZATION
Introduction, Calculation of Quantization Error Variance, Uniform Quantization, Non-Uniform quantization, Logarithmic Quantization, Statistical Properties of Quantization Errors, Use of Dithering in coarse quantization, Transmission error effects, Adaptive quantization.

UNIT IV: PULSE CODE MODULATION (PCM)
Introduction, PCM coding of speech, Video and Audio Waveforms, PCM Systems for high quality speech coding.

UNIT V: DIFFERENTIAL PCM
Introduction, Linear Predictors of order 1, 2, 3, and N, Low complexity DPCM systems, Adaptive prediction, Distance sample based predictions for periodic signals.

UNIT VI: DELTA MODULATION (DM)
Introduction, Quantization noise in single integration DM, Double integration, second order prediction, Adaptive Delta modulation, Transmission error effects.

UNIT VII: SUB-BAND CODING
Introduction, Transmission rate, SNR and Gain over PCM, The integer-band filter bank, Sub-band coding of speech.

UNIT VIII: TRANSFORM CODING
Introduction, Linear Transforms of order N = 2, and N×N Transforms, Optimum Bit allocation and Zonal Sampling, Sub-optimum transforms (DHT, DWHT, DFT, DCT), Adaptive transform coding for speech and images.

TEXT BOOKS:

1. N. S. Jayant and Peter Noll, *Digital Coding of Waveforms – Principles and Applications to Speech and Video,* Prentice Hall, New Jersey.
2. Douglas O'Shaugnessy, *Speech Communication – Human and Machine,* IEEE Press, 2000.

REFERENCE BOOKS:

1. L. R. Rabiner, *Digital Processing of Speech Signals,* Pearson, 1978.
2. T. F. Quatieri, *Discrete-time speech signal processing: Principles and Practice,* Pearson, 2002.

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16107) MOBILE AD-HOC NETWORKS
(Elective - I)

UNIT I: INTRODUCTION
Applications, History of Wireless Communication, Simplified Reference Model. Wireless Transmission: Introduction, Frequencies for Radio Transmission, Signals, Modulation, Cellular Spectrums. Wireless LAN: Introduction, Infrared vs Radio Transmission, Infrastructure and Adhoc Networks, IEEE802.11, Hyper LAN, Bluetooth.

UNIT II: MEDIUM ACCESS CONTROL
Introduction, Motivation for a Specialized MAC, SDMA, FDMA, TDMA, CDMA.

UNIT III: MOBILE NETWORK LAYER
Introduction, Mobile IP, Dynamic Host Configuration Protocol, Adhoc Network.

UNIT IV: MOBILE TRANSPORT LAYER
Introduction, Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit/Fast Recovery, Transmission/Time Out Freezing, Selective Retransmission, Transmission Oriented TCP.

UNIT V: ADHOC NETWORKS
Fundamentals: Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, Radio Propagation Mechanisms, Characteristics of the Wireless Channel.
Adhoc Routing Protocols: Introduction, Issues in Designing A Routing Protocol for Ad Hoc Wireless Networks, Classifications of Routing Protocols, Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Ad Hoc on-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), Temporally Ordered Routing Algorithm (TORA), Signal Stability Routing (SSR), Location-Aided Routing (LAR), Power-Aware Routing (PAR), Zone Routing Protocol (ZRP).

UNIT VI: MULTICAST ROUTING IN ADHOC NETWORKS
Introduction, Issues in Designing A Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree–based Multicast Routing Protocols- Bandwidth Efficient Multicast Routing Protocol, Zone Based – Core Extraction Routing Protocol, Ad Hoc on-Demand Vector Routing Protocol, Mesh-Based Multicast Routing Protocols, On-Demand Multicast Dynamic Core Based Multicast Routing Protocol, Energy-Efficient Reliable Broadcast And Multicasting Protocols, Wireless Ad Hoc Real-Time Multicasting, Application, Dependent Multicast Routing.

UNIT VII: TRANSPORT LAYER-SECURITY PROTOCOLS

Introduction- Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Ad Hoc Transport Protocol, Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Secure Routing in Ad Hoc Wireless Networks, Requirements, Security Aware Ad Hoc Routing Protocol.

UNIT VIII: QOS AND ENERGY MANAGEMENT

Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classification of QoS Solutions, MAC Layer Solutions, Cluster TDMA, IEEE802.11e, Network Layer Solutions, QoS Routing Protocols, On-Demand QoS Routing Protocol, QoS Frameworks for Ad Hoc Wireless Networks, QoS Models, QoS Resource Reservation Signalling, INSIGNIA. Energy Management in Ad Hoc Wireless Networks: Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Energy Management Schemes, Battery Management Schemes.

TEXT BOOKS:

1. Jochen Schiller, *Mobile Communications,* 2nd Edition, PE, 2004.
2. C.Siva Ram Murthy and B.S. Manoj, *Ad Hoc Wireless Networks Architectures and Protocols,* Prentice Hall, 2004.

REFERENCE BOOKS:

1. Lee, *Cellular Mobile Communication,* TMH.
2. Pandya, *Mobile and Personal Communication Systems and Services,* PHI, 2003.
3. C. K. Toh, *Ad Hoc Mobile Wireless Networks Protocols and Systems,* Prentice Hall, PTR, 2001.
4. Charles E.Perkins, *Ad Hoc Networking,* Addison Wesley, 2000.

M. Tech. (CMS)	L	T	P	C
I SEMESTER	4	-	-	4

(10MT16108) RADAR SIGNAL PROCESSING
(Elective - I)

UNIT I:
Introduction– Radar Block Diagram, Radar Equation, Information Available from Radar Echo, Review of Radar Range Performance– General Radar Range Equation, Radar Detection with Noise Jamming, Beacon and Repeater Equations, Bistatic Radar.

UNIT II: DETECTION OF RADAR SIGNALS IN NOISE - I
Matched Filter Receiver – Impulse Response, Frequency Response Characteristic and its Derivation, Matched Filter and Correlation Function, Correlation Detection and Cross-Correlation Receiver. Efficiency of Non-Matched Filters, Matched Filter for Non-White Noise.

UNIT III: DETECTION OF RADAR SIGNALS IN NOISE - II
Detection Criteria – Neyman-Pearson Observer, Likelihood-Ratio Receiver, Inverse Probability Receiver, Sequential Observer, Detectors –Envelope Detector, Logarithmic Detector, I/Q Detector. Automatic Detection - CFAR Receiver, Cell Averaging CFAR Receiver, CFAR Loss, CFAR Uses in Radar, Radar Signal Management –Schematics, Component Parts, Resources and Constraints.

UNIT IV: WAVEFORM SELECTION [3, 2]
Radar Ambiguity Function and Ambiguity Diagram – Principles and Properties; Specific Cases – Ideal Case, Single Pulse of Sine Wave, Periodic Pulse Train, Single Linear FM Pulse, Noise like Waveforms. Waveform Design Requirements, Optimum Waveforms for Detection in Clutter, Family of Radar Waveforms.

UNIT V: PULSE COMPRESSION IN RADAR SIGNALS
Introduction, Significance, Types. Linear FM Pulse Compression – Block Diagram, Characteristics, Reduction of Time Sidelobes, Stretch Techniques, Generation and Decoding of FM Waveforms – Block Schematic and Characteristics of Passive System, Digital Compression, SAW Pulse Compression.

UNIT VI: PHASE CODING TECHNIQUES
Principles, Binary Phase Coding, Barker Codes, Maximal Length Sequences (MLS/LRS/PN), Block Diagram of a Phase Coded CW Radar.

UNIT VII: POLY PHASE CODES

Frank Codes, Costas Codes, Non-Linear FM Pulse Compression, Doppler Tolerant PC Waveforms – Short Pulse, Linear Period Modulation (LPM/HFM), Sidelobe Reduction for Phase Coded PC Signals.

UNIT VIII:

Other Types of PC Waveforms – Basics of Nonlinear Binary Phase Coded Sequences, Complementary Codes, Huffman Codes, Concatenated Barker Codes. Limiting in Pulse Compression, Cross-Correlation Properties, Compatibility, Comparison of Different Pulse Compression Waveforms.

TEXT BOOKS:

1 M.I. Skolnik, *Radar Handbook,* 2nd Edition, McGraw Hill, 1991.
2 Fred E. Nathanson, *Radar Design Principles – Signal Processing and The Environment,* 2nd Edition, PHI, 1999.
3 M.I. Skolnik, *Introduction to Radar Systems,* 3rd Edition, TMH, 2001.

REFERENCE BOOKS:

1. Peyton Z. Peebles, *Radar Principles,* Jr., John Wiley, 2004.
2. R. Nit berg, *Radar Signal Processing and Adaptive Systems,* Artech House, 1999.
3. F.E. Nathanson, *Radar Design Principles,* 1st Edition, McGraw Hill, 1969 & Nelson Morgan, Wiley.

M. Tech. (CMS)	L	T	P	C
I SEMESTER	-	-	4	2

(10MT16109) COMMUNICATION LAB - I

Tools:
Numerical Computing Environments – GNU Octave or MATLAB or any other equivalent tool.

List of experiments:

1. Generation of discrete time i.i.d. random processes with different distributions (Bernoulli, Binomial, Geometric, Poisson, Uniform, Gaussian, Exponential, Laplacian, Rayleigh, Rician).

2. Communication system Design for Band limited Channels: Signal Design for Zero ISI.

3. Design of Baseband Communication Systems with Optimum terminal filters.

4. Simulation & performance evaluation of QPSK communication system for AWGN channel.

5. Simulation of maximal sequences of any length & verification of their properties.

6. Generation Of Gold Codes & verification of auto-correlation & cross correlation properties.

7. Design and simulation of code matched filter in spread spectrum communication system.

8. Simulation of CSMA and CSMA/CD in Ethernet and LAN Environments.

REFERENCE BOOKS:
1. W.H. Tranter, K. Sam Shanmugham, T.S. Rappaport, and K.L. Kosbar, *Principles of Communication System Simulation with Wireless Applications,* Pearson, 2004.
2. J.G. Proakis, and M. Salehi, *Contemporary Communication Systems using MATLAB,* Bookware Companion Series, 2006.
3. E. Aboelela, *Network Simulation Experiments Manual,* The Morgan Kaufmann Series in Networking, 2007.

M. Tech. (CMS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23805) WIRELESS COMMUNICATIONS

UNIT I: INTRODUCTION TO WIRELESS COMMUNICATIONS SYSTEMS

Evolution, Examples of wireless communications systems, Comparison, Second Generation Cellular Networks, WLL, Bluetooth and Personal Area networks.

UNIT II: LARGE SCALE PATH LOSS AND SHADOWING

Introduction to radio wave propagation, Free Space Propagation Model, Propagation mechanisms, Reflection, Ground Reflection (Two Ray) model, Diffraction, Scattering, outdoor Propagation Model and In door Propagation model.

UNIT III: SMALL SCALE FADING AND MULTIPATH

Small Scale Multipath Propagation, Impulse Response Model of a multipath Channel, Small Scale Multipath Measurements, Parameters of a Mobile Multipath Channels, types of Small Scale Fading, Statistical models for Multipath Fading Channels, Theory of Multipath Shape Factors for Small Scale Fading Wireless Channels.

UNIT IV: DIVERSITY TECHNIQUES

Time Diversity, Frequency Diversity, polarization Diversity and Space Diversity, Receiver Diversity—Concept of diversity branches and signal paths, combining methods: Selective diversity combining, Scanning diversity, maximal ratio combining and Equal gain combining, Performance analysis for Rayleigh fading channels (of selection and maximal ratio combining),RAKE Receiver, Interleaving as time diversity.

UNIT V: CELLULAR CONCEPT- SYSTEM DESIGN FUNDMENTALS

Frequency reuse, Channel assignment strategies, Handoff strategies, Interference and System Capacity—Co-channel Interference and System Capacity, Capacity of Cellular CDMA, Capacity of CDMA with Multiple Cells, Channel Planning for Wireless systems, Adjacent channel Interference, Trunking and Grade of Service, Improving Capacity—Cell Splitting and Sectorization,

UNIT VI: ACCESS AND DUPLEX TECHNIQUES

FDMA, TDMA, Frame Slot Format for TDMA Systems, Super Frame Format, Synchronization of Slot, Frame & Super Frame, CDMA, Near Far Problem and Power Control, Synchronization Specific for CDMA, Comparison of FDMA, TDMA, CDMA, FDD&TDD.

UNIT VII: INTRODUCTION TO SPACE-TIME WIRELESS COMMUNICATIONS

Introduction, Exploiting Multiple antennas in wireless links, Space-Time (ST) Channel and Signal Models—SIMO, MISO, MIMO Channels, Physical Scattering Models for ST Channels, Sampled Signal Model, Capacity of ST Channels-Capacity of Frequency flat deterministic MIMO channel, Channel unknown & known to the transmitter, Capacity of random MIMO channels, Capacity to frequency selective MIMO channels.

UNIT VIII: WIRELESS SYSTEMS AND STANDARDS

GSM for Mobile - Specifications and Air Interface, CDMA digital Cellular Standard (IS 95)-Frequency and Channel Specifications, Forward and Reverse Channels, CDMA 3G Systems: UMTS & CDMA 2000 standards and Specifications.

TEXT BOOKS:

1. T.S. Rappaport, *Wireless communications, principals & practice,* 2nd Edition, PHI, 2001.
2. Andrea Goldsmith, *Wireless communications,* Cambridge University Press.
3. Arogya Swamy Paulraj, Rohit Nabar & D.Gore, *Introduction to Space-Time Wireless Communications,* Cambridge University Press, 2003.
4. G.L.Stuber, *Principals of mobile communications,* 2nd Edition, Kluwer academic publishers.

REFERENCE BOOKS:

1. Seiichi Samei, *Applications of Digital Wireless Technologies to Global Wireless Communications,* Prentice Hall PTR, NJ, 1997.
2. A.J.Viterbi, *CDMA- Principals of Spread Spectrum,* Addison Wesley, 1995.
3. Kamilo Feher, *Wireless Digital Communication,* PHI, 1995.
4. R.L Peterson, R.E. Ziemer and David E.Borth, *Introduction to Spread Spectrum Communication,* Pearson Education.
5. T L Singal, *Wireless Communications,* Tata McGraw Hill, 2010.
6. Simon Haykin and Michael, *Modern Wireless Communications,* Pearson Education.

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II SEMESTER	4	-	-	4

(10MT26102) DIGITAL SATELLITE COMMUNICATIONS

UNIT I: EFFICIENT TECHNIQUES
Demand Assignment Multiple Access and Digital Speech Interpolation: The ERLANG B Formula-Types of Demand Assignments-DAMA Characteristics-Real-Time Frame Reconfiguration, Frame and Burst Structures for DA-TDMA, Repacking On-Going calls, How Fast is Frame Reconfiguration-DAMA Interfaces-SCPC-DAMA-SPADE-Digital Speech Interpolation-References-Problems.

UNIT II: SATELLITE PACKET COMMUNICATIONS
Preliminaries-Message Transmission By FDMA: The M/G/1 Queue-Message Transmission by TDMA-Pure ALOHA: Satellite Packet Switching-Slotted ALOHA-Packet Reservation-Tree Algorithm.

UNIT III: CARRIER AND SYMBOL TIMING SYNCHRONIZATION
Carrier Recovery For MPSK, Analysis, Performance in Noise-Phase-Locked Loop, Principle Of Operation, Steady-state Tracking Performance, Transient Response, Phase Jitter Due to Noise, Hang-up. Carrier Recovery Circuit With Narrowband Band Pass Filter And Automatic Frequency Control Loop: Single-Tuned Band pass Filter, Double-Tuned Band Pass Filter, Cycle Slipping, Interburst Interference, Burst-to-Burst Frequency Variations-Symbol Timing Recovery Circuit.

UNIT IV: SATELLITE SPREAD SPECTRUM COMMUNICATIONS
Direct Sequence Spread Spectrum Systems, PN Sequence, Error Rate Performance in Uniform Jamming, Error Rate Performance in Pulsed Jamming-Direct Sequence Code Division Multiple Access, Sequence-Synchronous DS-CDMA, Sequence-Asynchronous DS-CDMA, Sequence-Asynchronous MFSK/DS-CDMA, Random Access DS-CDMA, DS-CDMA Link Analysis-Frequency HOP Spread Spectrum Systems-Frequency HOP Code Division Multiple Access-DS Acquisition and Synchronization-FH Acquisition and Synchronization-Satellite on Board Processing.

UNIT V:
VERY SMALL APERTURE TERMINAL NETWORKS: VSAT Technologies - Network Configurations-Multi-access and Networking- Network Error Control, Go-Back-N for SCPC or DS-CDMA Channels, Link control for variable length packet Aloha/TDM- Polling VSAT Networks.
MOBILE SATELLITE NETWORKS: Operating Environment-MSAT Network Concept-CDMA MSAT Network-Statistics of Mobile Propagation.

UNIT VI&VII: LOW EARTH ORBIT AND NON-GEOSTATIONARY SATELLITE SYSTEMS

Introduction-Orbit Considerations, Equatorial Orbits, Inclined Orbits, Elliptical Orbits, Molniya Orbit, Radiation Effects, Sun Synchronous Orbit-Coverage and Frequency Considerations, General Aspects, Frequency band, Elevation Angle Considerations, Number of Beams Per Coverage, Off-Axis Scanning, Determination of Optimum Orbital Altitude, Radiation Safety And Satellite Telephones, Projected NGSO System Customer Service Base-Delay and Throughput Considerations-System considerations, Incremental Growth, Interim Operations, Replenish Operations, End-to-End System Implementation-Operational NGSO Constellation Designs, Ellipse, Global star, New ICO, Iridium, Orbcomn, Sky bridge, Teledesic. Direct Broadcast Satellite

UNIT VIII: TELEVISION AND RADIO

C-Band and Ku-Band Home Satellite TV-Digital DBS TV- DBS-TV System Design-DBS-TV Link Budget-Error Control in Digital DBS-TV, Master Control Station and Uplink-Installation of DBS-TV Antennas-Satellite Radio Broadcasting.

TEXT BOOKS:

1. Tri T. Ha, *Digital Satellite Communications,* 2nd Edition, McGraw-Hill Professional.
2. Timothy Pratt, Charles Bostian, Jeremy Allnutt, *Satellite Communications,* 2nd Edition, Wiley India Edition.

REFERENCE BOOKS:

1. Dennis Roddy, *Satellite Communications,* 4th Edition, Tata McGraw-Hill Education Private Limited.

M. Tech. (CMS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23801) ADAPTIVE SIGNAL PROCESSING

UNIT I: EIGEN ANALYSIS
Eigen Value Problem, Properties of eigen values and eigen vectors, Eigen Filters, eigen Value computations.

UNIT II: INTRODUCTION TO ADAPTIVE SYSTEMS
Definitions, Characteristics, Applications, Example of an Adaptive System. The Adaptive Linear Combiner - Description, Weight Vectors, Desired Response Performance function, Gradient & Mean Square Error.

UNIT III:
DEVELOPMENT OF ADAPTIVE FILTER THEORY & SEARCHING THE PERFORMANCE SURFACE: Introduction to Filtering, Smoothing and Prediction, Linear Optimum Filtering, Problem statement, Principle of Orthogonality - Minimum Mean Square Error, Wiener- Hopf equations, Error Performance - Minimum Mean Square Error.
SEARCHING THE PERFORMANCE SURFACE: Methods & Ideas of Gradient Search methods, Gradient Searching Algorithm & its Solution, Stability & Rate of convergence - Learning Curves.

UNIT IV: STEEPEST DESCENT ALGORITHMS
Gradient Search by Newton's Method, Method of Steepest Descent, Comparison of Learning Curves.

UNIT V:
LMS ALGORITHM & APPLICATIONS: Overview - LMS Adaptation algorithms, Stability & Performance analysis of LMS Algorithms - LMS Gradient & Stochastic algorithms, Convergence of LMS algorithm.
APPLICATIONS: Noise cancellation, Cancellation of Echoes in long distance telephone circuits, Adaptive Beam forming.

UNIT VI: RLS ALGORITHM
Matrix Inversion lemma, Exponentially weighted recursive least square algorithm, update recursion for the sum of weighted error squares, convergence analysis of RLS Algorithm, Application of RLS algorithm on Adaptive Equalization

UNIT VII: KALMAN FILTERING
Introduction, Recursive Mean Square Estimation Random variables, Statement of Kalman filtering problem, Filtering, Initial conditions, Variants of Kalman filtering, Extend Kalman filtering.

UNIT VIII: NON LINEAR ADAPTIVE FILTERING

Theoretical and Practical considerations of Blind Deconvolution, Buss Gang Algorithm for blind Equalization of real base band Channels.

TEXT BOOKS:

1. Bernard Widrow, Samuel D. Strearns, *Adaptive Signal Processing,* PE, 2005.
2. Simon Haykin, *Adaptive Filter Theory,* 4th Edition, PE Asia, 2002.

REFERENCE BOOKS:

1. Alexander D Poularikas & zayed m Ramadan, CRC, *Adaptive Filtering Primer with MATLAB,* Taylor & Francis group.
2. Sophocles. J. Orfamadis, *Optimum signal processing: An introduction,* 2nd Edition, McGraw-Hill, Newyork, 1988.
3. S.Thomas Alexander, *Adaptive signal processing-Theory and Applications,* Springer –Verlag, 1986.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23808) OPTICAL COMMUNICATIONS

UNIT I: INTRODUCTION
Evolution of fiber types, guiding properties of fibers, cross talk between fibers, coupled modes and mode mixing, dispersion properties of fibers, nonlinear properties of optical fibers, SRS, SBS, intensity dependent refractive index.

UNIT II: OPTICAL AND MECHANICAL CHARACTERIZATION OF FIBERS
Fiber design considerations: diameter, cladding thickness, low and high bit rate systems, characterization of materials for fibers, fiber perform preparation, fiber drawing and control, roles of coating and jacketing.

UNIT III: OPTICAL CABLE DESIGN
Design objectives and cable structures, fiber splicing, fiber end preparation, single and array splices, measurement of splicing effects, optical fiber connectors, Connector alignments.

UNIT IV: OPTICAL SOURCES AND DETECTORS
Optical sources for communication, LED, injection lasers, modulation technique, direct and indirect methods, optical waveguide devices. Photodiodes in repeaters, receiver design, digital and analog, transmission system design, system design choices, passive and low speed active optical components for fiber system, micro-optic components, lens-less components.

UNIT V: OPTICAL FIBER COMPONENTS
Couplers, Isolators and Circulators, Multiplexers, Bragg grating, Fabry-perot Filters, Mach zender interfermometers, Arrayed waveguide grating, tunable filters, hi-channel count multiplexer architectures, optical amplifiers, direct and external modulation transmitters, pump sources for amplifiers, optical switching and wave length converters.

UNIT VI: OPTICAL FIBER TECHNIQUES
Modulation and demodulation, signal formats, direction detection receivers, coherent detection.

UNIT-VII: ACCESS NETWORK
Network architecture, HFC, FTTC, optical access network architecture, deployment considerations, upgrading the transmission capacity, SDM, TDM, WDM, application areas, inter exchange, undersea, local exchange networks; Packaging and cabling of photonics components- photonic packet switching, OTDM, multiplexing and demultiplexing, optical logic gates, synchronization, broadcast OTDM network, OTDM testbeds.

UNIT-VIII: SOLITON COMMUNICATION

Basic principle, metropolitan optical network, cable TV network, optical access network, photonics simulation tools, error control coding techniques, nonlinear optical effects in WDM transmission.

TEXT BOOKS:

1. S.E.Miller, A.G.Chynoweth, *Optical Fiber Telecommunication,* 1979.
2. Rajiv Ramaswamy and Kumar and N. Sivaranjan, *Optical Networks*.
3. I Kaninov, T Li, *Optical Fiber Telecommunication IV B*.

REFERENCE BOOKS:

1. S E Miller, I Kaninov, *Optical Fiber Telecommunication II*.
2. Govind Agarwal, *Optical Fiber Communications*.
3. Gil Held, Deploying, *Optical Network Components*.
4. Gerd Kaiser, *Optical Fiber Communication*, McGraw Hill.
5. John. M. Senior, *Optical fiber communications: Principles and Practice*.

M. Tech. (CMS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT26105) RF SYSTEMS AND CIRCUITS

UNIT I:
Review of Basic Transmission Line Theory, Planar Transmission Lines - Stripline, microstrip line, suspended stripline and coplanar line.

UNIT II:
Parallel coupled lines in stripline and microstrip – Analysis, design and characteristics.
Microwave Network Analysis - Microwave network representation, Impedance and admittance matrices, Scattering parameters, Typical two-port, three port, four port networks.

UNIT III&IV:
Impedance Matching Techniques - Smith chart, Matching networks using lumped elements, Single- and double-stub matching, Quarter wave transformer, Multisection transformers -Binomial and Chebyshev. Basic Passive Components -Lumped elements in MIC, Discontinuities and resonators in microstrip, Balun. Analysis and design of stripline/microstrip components- Directional couplers, Power divider, Hybrid ring.

UNIT V:
Switches and Phase Shifters - PIN diode– Equivalent circuit and Characteristics, Basic series and shunt switches in microstrip; SPST and SPDT switches, Switched line, branchline coupled and loaded line phase shifters in microstrip. Applications in phased arrays.

UNIT VI&VII:
MIC Filters - Lumped element filter design at RF. Impedance and Low pass scaling, Frequency transformation, High impedance/Low impedance low pass filter, Parallel coupled band pass filter, Spur line band stop filter, Realization in microstrip and suspended stripline Basics of MIC, MMIC and MEMS technologies - Substrates used. Fabrication process. Relative advantages. Examples- Realization of lumped elements and filters in MMIC, Realization of planar transmission lines and filters in MEMS.

UNIT VIII: DETECTOR AND DEMODULATOR CIRCUITS
AM envelope detectors, Noise, Balanced demodulators, Synchronous AM demodulation, Double-Side band (DSBSC) and single,sideband(SSBSC) suppressed carrier demodulators, FM and PM demodulator circuits, Discriminator circuits, Ratio detector circuits, Pulse-counting detectors, Phase locked loop FM/PM detectors, Quadrature detector.

TEXT BOOKS:

1. M.M. Radmanesh, *Radio Frequency and Microwave Electronics,* Pearson Education, Asia, 2001.
2. Joseph J. Carr, *Secrets of RF Circuit Design,* 3rd Edition, Tata Mc Graw Hill.

REFERENCE BOOKS:

1. B. Bhat & S.K. Koul, *Stripline-Like Transmission Line For Microwave Integrated Circuits,* New Age Intl. (P) Ltd., 1989.
2. D. K. Misra, *Radio Frequency and Microwave Communication Circuits – Analysis and Design,* John Wiley & Sons, 2001.
3. D. M. Pozar, *Microwave Engineering,* 2nd Edition, John Wiley & Sons, 1998.

M. Tech. (CMS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT26106) MIMO COMMUNICATION SYSTEMS
(Elective - II)

UNIT I&II: INFORMATION THEORETIC ASPECTS OF MIMO
Review of SISO fading communication channels, MIMO channel models, Classical i.i.d. and extended channels, Frequency selective and correlated channel models, Capacity of MIMO channels, Ergodic and outage capacity, Capacity bounds and Influence of channel properties on the capacity.

UNIT III&IV: MIMO DIVERSITY AND SPATIAL MULTIPLEXING
Sources and types of diversity, analysis under Rayleigh fading, Diversity and channel knowledge. Alamouti space time code, MIMO spatial multiplexing. Space time receivers. ML, ZF, MMSE and Sphere decoding, BLAST receivers and Diversity multiplexing trade-off.

UNIT V&VI: SPACE TIME BLOCK CODES
Space time block codes on real and complex orthogonal designs, Code design criteria for quasi-static channels (Rank, determinant and Euclidean distance), Orthogonal designs, Generalized orthogonal designs, Quasi-orthogonal designs and Performance analysis.

UNIT VII&VIII: SPACE TIME TRELLIS CODES
Representation of STTC, shift register, generator matrix, state-transition diagram, trellis diagram, Code construction, Delay diversity as a special case of STTC and Performance analysis.

TEXT BOOKS:
1. David Tse and Pramod Viswanath, *Fundamentals of Wireless Communication,* Cambridge University Press 2005.
2. Hamid Jafarkhani, *Space-Time Coding: Theory and Practice,* Cambridge University Press 2005.

REFERENCE BOOKS:
1. Paulraj, R. Nabar and D. Gore, *INTRODUCTION TO SPACE-TIME WIRELESS COMMUNICATIONS,* Cambridge University Press 2003.
2. G. Larsson and P. Stoica, *SPACE-TIME BLOCK CODING FOR WIRELESS COMMUNICATIONS,* 4th Edition, Cambridge University Press, 2008.
3. Ezio Biglieri, Robert Calderbank et al, *MIMO WIRELESS COMMUNICATIONS,* Cambridge University Press 2007.

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II SEMESTER	4	-	-	4

(10MT26107) SECURE COMMUNICATION
(Elective - II)

UNIT I&II:
Rings and fields - Homomorphism- Euclidean domains - Principal Ideal Domains - Unique Factorization Domains - Field extensions- Splitting fields - Divisibility- Euler theorem - Chinese Remainder Theorem - Primality.

UNIT III&IV:
Basic encryption techniques - Concept of cryptanalysis - Shannon's theory - Perfect secrecy - Block ciphers - Cryptographic algorithms - Features of DES – Linear and Differential Cryptanalysis – AES - Stream ciphers - Pseudo random sequence generators – linear complexity - Non-linear combination of LFSRs - Boolean functions – Cryptanalysis of LFSR based stream ciphers.

UNIT V&VI:
Private key and Public key cryptosystems - One way functions - Discrete log problem – Factorization problem - RSA encryption - Diffie Hellmann key exchange - Message authentication and hash functions -Digital signatures - Secret sharing - features of visual cryptography - other applications of cryptography.

UNIT VII&VIII:
Elliptic curves - Basic theory - Weirstrass equation - Group law - Point at Infinity -Elliptic curves over finite fields - Discrete logarithm problem on EC - Elliptic curve cryptography – Integer factorization - Diffie Hellmann key exchange over EC - Elgamal encryption over EC – ECDSA.

TEXT BOOKS:
1. Douglas A. Stinson, Chapman & Hall, *Cryptography, Theory and Practice,* 2nd Edition, CRC Press Company, Washington.
2. Wade Trappe, Lawrence C. Washington, *Introduction to Cryptography with Coding Theory,* 2nd Edition, Pearson Education, 2006.

REFERENCE BOOKS:
1. William Stallings, *Cryptography and Network Security,* 4th Edition, Pearson Education, 2006.
2. Lawrence C. Washington, Chapman & Hall, *Elliptic Curves,* CRC Press Company, Washington.
3. David S. Dummit, Richard M. Foote, *Abstract Algebra,* John Wiley & Sons.
4. Evangelos Kranakis, *Primality and Cryptography,* John Wiley & Sons.
5. Rainer A. Ruppel, *Analysis and Design of Stream Ciphers,* Springer Verlag.

M. Tech. (CMS)	L	T	P	C
II SEMESTER	4	-	-	4

(10MT23807) IMAGE PROCESSING
(Elective - II)

UNIT I: IMAGE REPRESENTATION:
Gray scale and colour Images, image sampling and quantization. Two dimensional orthogonal transforms: DFT, WHT, Haar transform, KLT, DCT.

UNIT II: IMAGE ENHANCEMENT:
Filters in spatial and frequency domains, histogram-based processing, homomorphic filtering. Edge detection, non parametric and model based approaches, LOG filters, localization problem.

UNIT III: IMAGE RESTORATION:
Degradation Models, PSF, circulant and block - circulant matrices, deconvolution, restoration using inverse filtering, Wiener filtering and maximum entropy-based methods.

UNIT IV: IMAGE SEGMENTATION:
Pixel classification, Bi-level Thresholding, Multi-level Thresholding, P-tile method, Adaptive Thresholding, Spectral & spatial classification, Edge detection, Hough transform, Region growing.

UNIT V: FUNDAMENTAL CONCEPTS OF IMAGE COMPRESSION:
Compression models, Information theoretic perspective, Fundamental coding theorem.

UNIT VI: LOSSLESS COMPRESSION:
Huffman Coding, Arithmetic coding, Bit plane coding, Run length coding, Lossy compression: Transform coding, Image compression standards.

UNIT VII: VIDEO PROCESSING:
Representation of Digital Video, Spatio-temporal sampling, Motion Estimation.

UNIT VIII:
Video Filtering, Video Compression, Video coding standards.

TEXT BOOKS/REFERENCE BOOKS:

1. R. C. Gonzalez, R. E. Woods*, Digital Image Processing,* 2nd Edition, Pearson Education, 2002.
2. W. K. Pratt, *Digital Image Processing,* Prentice Hall, 1989.
3. A. Rosenfold and A. C. Kak, Digital Image Processing, Vols. 1 and 2, Prentice Hall, 1986.
4. H. C. Andrew and B. R. Hunt, *Digital Image Restoration,* Prentice Hall, 1977.
5. R. Jain, R. Kasturi and B.G. Schunck, *Machine Vision,* McGraw-Hill International Edition, 1995.
6. A. M. Tekalp, *Digital Video Processing,* Prentice-Hall, 1995.
7. A. Bovik, *Handbook of Image & Video Processing,* Academic Press, 2000.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (AUTONOMOUS)

M. Tech. (CMS)	L	T	P	C
II SEMESTER	-	-	4	2

(10MT26109) COMMUNICATION LAB - II

Course Tools:- Numerical Computing Environments – GNU Octave or MATLAB or any other equivalent tool and specialized tools line OPNET/NS-2 etc.

Experiment List:

1. Simulation of Rayleigh fading channel in the mobile environment.
2. Design and performance evaluation of CDMA communication system over a Gaussian channel.
3. Design and performance evaluation of CDMA communication system over a multipath Rayleigh fading channel.
4. Simulation of communication system using convolutional codes & Viterbi Decoding.
5. Design and simulation of an adaptive equalizer using LMS algorithm.
6. Design and simulation of an adaptive equalizer using RLS algorithm.
7. Design and simulation of communication system using Bussgang Blind channel equalizer.
8. Low pass filtering of a given image & Sharpening a given image.
9. Color image in various color models.

REFERENCE BOOKS:

1. W.H. Tranter, K. Sam Shanmugham, T.S. Rappaport, and K.L. Kosbar, *Principles of Communication System Simulation with Wireless Applications,* Pearson, 2004.
2. J.G. Proakis, and M. Salehi, *Contemporary Communication Systems using MATLAB,* Bookware Companion Series, 2006.
3. Simon Haykin, *Adaptive filter theory,* 4th Edition, PE Asia, 2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

DEPARTMENT OF EEE

COURSE STRUCTURE for M.Tech. (ELECTRICAL POWER SYSTEMS)

I – SEMESTER

Subject Code	Subject	L	T	P	Credits	Max. Marks		
						Internal	External	Total
10MT10701	Advanced Control Systems	4	-	-	4	40	60	100
10MT10702	EHVAC Transmission	4	-	-	4	40	60	100
10MT10703	Microprocessors & Microcontrollers	4	-	-	4	40	60	100
10MT10704	Power System Control & Stability	4	-	-	4	40	60	100
10MT10705	Reactive Power Compensation & Management	4	-	-	4	40	60	100
Elective - I								
10MT10706	Advanced Digital Signal Processing	4	-	-	4	40	60	100
10MT10707	Neural Networks & Fuzzy Systems	4	-	-	4	40	60	100
10MT10708	Power Quality	4	-	-	4	40	60	100
Laboratory								
10MT10709	Power Systems & Relays lab	-	-	3	2	25	50	75
	Total	**24**	**-**	**3**	**26**	**265**	**410**	**675**

II – SEMESTER

Subject Code	Subject	L	T	P	Credits	Max. Marks		
						Internal	External	Total
10MT20701	Economic Operation & Control of Power System	4	-	-	4	40	60	100
10MT20702	FACTS Controllers	4	-	-	4	40	60	100
10MT20703	HVDC Transmission	4	-	-	4	40	60	100
10MT20704	Power System Reliability	4	-	-	4	40	60	100
10MT20705	Static and Digital Protection of Power System	4	-	-	4	40	60	100
Elective - II								
10MT20706	Energy Audit, Conservation & Management	4	-	-	4	40	60	100
10MT20707	Power System Dynamics and Stability	4	-	-	4	40	60	100
10MT20708	Restructured Power System	4	-	-	4	40	60	100
10MT20709	Industrial Visit	-	-	-	2	50	-	50
Laboratory								
10MT20710	Computer Applications in Power Systems lab	-	-	3	2	25	50	75
	Total	**24**	**-**	**3**	**28**	**315**	**410**	**725**

III - SEMESTER

Subject Code	Course	Periods per Week			Credits	Internal	External	Total
		L	T	P				
10MT30701	Project Work Phase-I	-	-	-	4	50	-	50
	Total	-	-	-	4	50	-	50

IV – SEMESTER

Subject Code	Course	Periods per Week			Credits	Internal	External	Total
		L	T	P				
10MT40701	Project Work Phase-II	-	-	-	12	50	100	150
	Total	**-**	**-**	**-**	**12**	**50**	**100**	**150**

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

I M.Tech. (EPS)	L	T	P	C
I - Semester	4	-	-	4

(10MT10701) ADVANCED CONTROL SYSTEMS

UNIT–I: Design of Compensators & Controllers by Time Domain Approach
Control System Design by the root locus method-lead, lag and lag-lead compensation, PI, PD, PID Controllers design procedures and examples.

UNIT-II: Design of Compensators & Controllers by Frequency Response Approach
Control System Design by frequency response approach-lead, lag lag-lead compensation, PI, PD, PID Controllers – design procedures and examples.

UNIT–III: Controllability & Observability
General concept of Controllability - General concept of Observability - Controllability tests for Continuous – Time Invariant systems - Observability tests for Continuous - Time Invariant systems - Controllability and Observability of state model in Jordan Canonical form - Controllability and Observability Canonical forms of State model

UNIT–IV: Non-Linear Systems-I
Introduction – Non Linear Systems – Types of Non – Linearities – Saturation – Dead – Zone – Backlash – Jump Phenomenon etc; - Singular Points – Introduction to Linearization of nonlinear systems, properties of Non Linear Systems – Describing function – describing function analysis of nonlinear systems- Stability analysis of Non – Linear systems through describing functions

UNIT–V: Non-Linear Systems-II
Introduction to phase – plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase – plane analysis of nonlinear control systems.

UNIT–VI: Stability Analysis
Stability in the sense of Lyapunov, Lyapunov's stability and Lyapunov's instability theorems – Stability Analysis of the Linear Continuous time invariant systems by Lyapunov second method – Generation of Lyapunov functions – Variable gradient method – Krasooviski's method.

UNIT–VII: State Feedback Controllers & Observers
State Feedback Controller design through Pole Assignment – state observers

UNIT–VIII: Optimal Control Theory
Introduction to optimal control – Formulation of optimal control problems – calculus of variations – fundamental concepts, functional, variation of functional – fundamental theorem of Calculus of variations – boundary

conditions – constrained minimization – formulation using Hamiltonian method – Linear quadratic regulator

TEXT BOOKS:

1. M. Gopal, *Modern Control System Theory,* New Age International, 1984
2. Donald E. Kirk, *Optimal control Theory - An Introduction*, Dover Publications, New York, 1998
3. A. Nagoor Kani, *Advanced Control Theory,* 2nd Edition, RBA Publications.

REFERENCES:

1. Kuo, *Automatic Control Systems*, 7th Edition, Printice Hall of India
2. Ogata. K, *Modern Control Engineering*, 4th Edition, Prentice Hall, 1997

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(10MT10702) EHVAC TRANSMISSION

UNIT–I: Transmission Line Trends

E.H.V.A.C. Transmission line trends and preliminary aspect standard transmission voltages – Estimation at line and ground parameters

UNIT–II: Calculation of Line & Ground Parameters

Bundle conductor systems inductance and capacitance of E.H.V. lines – positive, negative and zero sequence impedance – Line Parameters for Modes of Propagation.

UNIT–III: Electrostatic Fields of EHV Lines and its adverse effects

Electrostatic field and voltage gradients – calculations of electrostatic field of AC lines – effect high electrostatic field on biological organisms and human beings surface voltage gradients and maximum gradients of actual transmission lines – voltage gradients on sub conductor

UNIT–IV: Measurement of Electrostatic Fields

Electrostatic induction in un-energized lines – measurements of field and voltage gradients for three phase single and double circuit lines – un-energized lines.

UNIT–V: Power Frequency Voltage control and over voltages in EHV lines

No load voltage – charging currents at power frequency - voltage control – shunt and series compensation – static VAR compensation.

UNIT–VI: Corona Effects – I: Power Loss and Audible Noise

Corona in E.H.V. lines – Corona loss formulae attention of traveling waves due to Corona – Audio noise due to Corona, its generation, characteristic and limits

UNIT–VII: Corona Effects – II: Audible Noise measurement and Radio interference

Measurements of audio noise radio interference due to Corona RF properties of radio noise – frequency spectrum of RI fields – Measurements of RI and RIV.

UNIT–VIII: Design of EHV Lines and EHV Cables

Design of EHV lines based on steady state and transient limits. EHV cables and their characteristics.

TEXT BOOKS:

1. Rakosh Das Begamudre, *Extra High Voltage AC Transmission Engineering*, 3rd Edition, New Age International Pvt. Ltd.

REFERENCES:

1. Edison Electric Institution (GEC), *EHV Transmission line reference Book*, Edison House, 1986
2. S. Rao, *EHVAC, HVDC Transmission and Distribution Engineering*, Khanna Publications, 2001

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I M.Tech. (EPS)	L	T	P	C
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(10MT10703) MICROPROCESSORS AND MICROCONTROLLERS

UNIT-I: Intel 8086/8088

Architecture, its register organization, Pin diagram, Minimum and Maximum Mode System and Timings, Machine language instruction formats, Addressing modes, Timing Diagram

UNIT-II: ALP Programming of 8086

Assembly Language Programming with an assembler, Assembler Directives, Instruction set, Procedures & Macros

UNIT-III: Peripherals & Their Interfacing

Memory Interfacing (DRAM), PPI- Modes of operation of 8255, Programmed I/O, Interrupt Driven I/O, interfacing to ADC & DAC, Stepper Motor Interfacing

UNIT-IV: Special Purpose of Programmable Peripheral Devices and their Interfacing:

Programmable Interrupt Controller 8259A, Programmable Communication Interface 8251 -USART and their interfacing.

UNIT-V: Advanced Processors

Architectural features of 80186, 80286, 80386, 80486 Processors & their memory management, Introduction to Pentium & Pentium Pro Processors their features, RISC Vs CISC Processors.

UNIT-VI: Microcontrollers

Introduction to Intel 8-bit and 16-bit Microcontrollers, 8051-Architecture, memory organization, Addressing modes.

UNIT-VII: Hardware Description of 8051

Instruction formats, Instruction set, Interrupt structure and interrupt priorities, Port structures and Operation, Timers & Counter functions - Different modes of operation and programming Examples.

UNIT-VIII: 8051 Interfacing and Industrial Applications

Interfacing of LED's & Relay's, Keyboard Interfacing, Interfacing Seven Segment Display, ADC & DAC Interfacing

TEXT BOOKS:

1. Douglas V. Hall, *Microprocessors and Interfacing - Programming and Hardware*, Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Barry b Brey, *The Intel Microprocessors - Architecture, Programming and interfacing*, Printice Hall of India Pvt. Ltd., New Delhi
3. Kenneth J Ayala,*The 8051 Microcontroller Architecture, Programming & Applications*, Thomson Publishers.

REFERENCES:

1. A K Ray & K M Bhurchandi, *Advanced Microprocessors and Peripherals – Architecture,Programming and Interfacing*, TMH Publishing Company, New Delhi
2. Muhammad Ali Mazidi, *The 8051 Microcontroller and Embedded Systems*, Pearson Education

I M.Tech. (EPS)	L	T	P	C
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(10MT10704) POWER SYSTEM CONTROL & STABILITY

UNIT-I: The Elementary Mathematical Model

A Classical model of one machine connected to an infinite bus – Classical model of multi-machine system –Problems – Effect of the excitation system on Transient stability.

UNIT-II: System Response to small Disturbances

The unregulated synchronous Machine – Effect of small changes of speed – modes of oscillation of an unregulated Multimachine system – regulated synchronous machine – voltage regulator with one time lag – Governor with one time lag – Problems.

UNIT-III: Dynamic Stability

Concept of Dynamic stability – state space model of one machine system connected to infinite bus – effect of excitation on Dynamic stability – examination of dynamic stability by Routh's criterion

UNIT-IV: Power system stabilizers

Introduction to supplementary stabilizing signals- Block diagram of the linear system- Approximate model of the complete exciter – generator system – Lead compensation – Stability aspect using Eigen value approach

UNIT-V: Excitation systems

Excitation system response – Non-continuously regulated systems – continuously regulated systems – Excitation system compensation – state space description of the excitation system- simplified linear model – effect of excitation on generator power limits.

UNIT-VI: Types of Excitation systems

Type –2 system: rotating rectifier system, Type-3 system: Static with terminal potential and current supplies - Type –4 system: non – continuous acting - Block diagram representation – state space modeling equations of these types.

UNIT-VII: Stability Analysis using direct method of Lyapunov

Review of Lyapunov's stability theorems of non-liner systems using energy concept – Method based on first concept – Method based on first integrals – Quadratic forms – Variable gradient method – Zubov's method – Popov's method, Lyapunov function for single machine connected to infinite bus.

UNIT-VIII: Introduction to Voltage stability

What is voltage stability –Factors affecting voltage instability and collapse – Comparison of Angle and voltage stability – Analysis of voltage instability and

collapse – Integrated analysis of voltage and Angle stability – Control of voltage instability.

TEXT BOOKS:

1. P.M. Anderson, A.A. Fouad, *Power System Control and Stability*, IOWA State University Press, 1st Edition, Galgotia Publications, Vol. – I & II.
2. M.A. Pai, *Power System Stability – Analysis by the direct method of Lyapunov*, North Holland Publishing Company, Newyork, 1981.

REFERENCES:

1. K.R. Padiyar, *Power System Dynamics (Stability & Control)*, 2nd Edition, B.S. Publications.
2. Prabha Kundur, Neal J. Balu, Mark G. Lauby, *Power system stability and control*, 2nd Edition, McGraw-Hill.

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I M.Tech. (EPS)	L	T	P	C
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(10MT10705) REACTIVE POWER COMPENSATION AND MANAGEMENT

UNIT-I: Theory of Load Compensation
Objectives and specifications – reactive power characteristics – ideal compensator – practical compensation – power factor correction and voltage regulation – Load compensator as a voltage regulator – phase balancing and power factor correction of unsymmetrical loads- examples.

UNIT-II: Steady–state reactive power compensation in transmission system:
Uncompensated line – types of compensation – Passive shunt and series and dynamic shunt compensation – examples

UNIT-III: Transient state reactive power compensation in transmission systems:
Characteristic time periods – passive shunt compensation – static compensations - series capacitor compensation – compensation using synchronous condensers – examples

UNIT-IV: Reactive power coordination and Quality in Supply
Objective – Mathematical modeling – Operation planning – transmission benefits – Basic concepts of quality of power supply – disturbances- steady – state variations – effects of under voltages – frequency – Harmonics, radio frequency and electromagnetic interferences

UNIT-V: Demand side management:
Load patterns – basic methods load shaping – power tariffs- KVAR based tariffs penalties for voltage flickers and Harmonic voltage levels

UNIT-VI: Distribution side Reactive power Management
System losses –loss reduction methods – examples – Reactive power planning – objectives – Economics Planning capacitor placement – retrofitting of capacitor banks

UNIT-VII: User side reactive power management
KVAR requirements for domestic appliances – Purpose of using capacitors – selection of capacitors – deciding factors – types of available capacitor, characteristics and Limitations

UNIT-VIII: Reactive power management in Industries
Typical layout of traction systems – reactive power control requirements – distribution transformers- Electric arc furnaces –textile and plastic industries-furnaces transformer –filter requirements – remedial measures –power factor of an arc furnace

TEXT BOOKS:

1. T.J.E. Miller, *Reactive power control in Electric power systems*, John Wiley and sons, 1982
2. D.M. Tagare, *Reactive power Management*, Tata McGraw-Hill, 2004.

REFERENCE:

1. Peter W. Sauer, Applied Mathematics for Restructured Electric Power systems.

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(10MT10706) ADVANCED DIGITAL SIGNAL PROCESSING
(Elective-I)

UNIT-I: Sampling
Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Re-construction of signal from its samples, effect of under sampling – Aliasing.

UNIT-II: Introduction To Digital Signal Processing
Discrete time signals & sequences, linear shift invariant systems, stability and causality. Linear constant coefficient difference equations. Frequency domain representation of discrete time signals and systems.

UNIT-III: Discrete Fourier Series
Properties of discrete Fourier series, DFS representation of periodic sequences.
Discrete Fourier Transforms: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT.

UNIT-IV: Fast Fourier Transforms
Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT and FFT for composite N

UNIT-V: Z–Transforms
Concept of Z- Transform of a discrete sequence. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms. Relation between Z-transform and DFS. Applications of Z – transforms.

Realization Of Digital Filters: solution of difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations, Basic structures of IIR systems, Transposed forms, Basic structures of FIR systems, System function.

UNIT-VI: IIR Digital Filters
Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, Design Examples: Analog-Digital transformations

UNIT-VII: FIR Digital Filters
Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Window Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT-VIII: Multirate Digital Signal Processing

Decimation, interpolation, sampling rate conversion, Implementation of sampling rate conversion.

TEXT BOOKS:

1. B.P. Lathi, *Signals, Systems & Communications*, BS Publications, 2003.
2. John G.Proakis, Dimitris G. Manolakis, *Digital Signal Processing, Principles, Algorithms, and Applications*, Pearson Education / PHI, 2007.
3. A.V.Oppenheim and R.W. Schaffer, *Discrete Time Signal Processing*, PHI

REFERENCES:

1. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, *Signals and Systems*, 2nd Edition, PHI.
2. Andreas Antoniou, *Digital Signal Processing*, TATA Mc Graw Hill, 2006
3. MH Hayes, *Digital Signal Processing*, Schaum's Outlines, TATA Mc-Graw Hill, 2007.
4. C. Britton Rorabaugh, *DSP Primer*, Tata Mc Graw Hill, 2005.
5. Robert J. Schilling, Sandra L. Harris, *Fundamentals of Digital Signal Processing using MATLAB*, Thomson, 2007.
6. Alan V. Oppenheim, Ronald W. Schafer, *Digital Signal Processing*, PHI, 2006

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I - Semester	4	-	-	4

(10MT10707) NEURAL NETWORKS & FUZZY SYSTEMS
(Elective-I)

UNIT-I: Introduction and Essentials of Artificial Neural Networks
Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Types of Neuron Activation Function, ANN Architectures, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules - Potential Applications of ANN.

UNIT-II: Feed Forward Neural Networks
Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.
Multilayer Feed Forward Neural Networks
Credit Assignment Problem, Generalized Delta Rule, Derivation of Backporpagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT-III: Associative Memories
Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem.
Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network.

UNIT-IV: Self-Organizing Maps (SOM) & Adaptive Resonance Theory (ART)
Introduction, Competitive Learning, Vector Quantization, Self-Organized Learning Networks, Kohonen Networks, Training Algorithms, Linear Vector Quantization, Stability- Plasticity Dilemma, Feed forward competition, Feedback Competition, ART1, ART2, Applications.

UNIT-V: Classical & Fuzzy Sets
Introduction to classical sets – properties, Operations and relations; Fuzzy sets, Membership, Uncertainity, Operations, Properties, fuzzy relations, cardinalities, membership functions.

UNIT-VI: Fuzzy Logic System Components
Fuzzy logic controller -Fuzzification, Membership Value assignment, fuzzy rule base-choice of variables- derivation of rules and decision making system,

Defuzzification to crisp sets - Defuzzification methods, Mamdani and sugeno fuzzy systems.

Unit-VII: Neuro Fuzzy Control

Fuzzy associative memories –Fuzzy and neural function estimators – FAM system Architecture – Comparison of Fuzzy and Neural systems-Adaptive neuro, Adaptive Fuzzy, Adaptive Neuro-Fuzzy interface systems- Neuro controller

Unit-VIII: Applications

Neural network applications: Process identification, Control and Process Monitoring, Fault diagnosis and Load forecasting.

Fuzzy logic applications: Fuzzy logic control for a temperature process and Fuzzy classification.

TEXT BOOKS:

1. S.Rajasekaran and G.A.Vijayalakshmi Pai, *Neural Netwroks, Fuzy logic, Gnenetic algorithms*: *synthesis and applications,* PHI, 2009.
2. S.N Sivanandam, S. Sumathi & S N Deepa, *Introduction to Neural Networks using MATLAB 6.0,* Tata Mc Graw Hill.
3. Timothy J. Ross, *Fuzzy logic with engineering applications*, 2nd Edition, Wiley Indian Edition
4. Bart Kosko, *Networks & Fuzzy Systems*, Prentice Hall India Pvt., Ltd.,

REFERENCES:

1. James A Freeman and Davis Skapura, *Neural Networks*, Pearson, 2002
2. Simon Hykins, *Neural Networks*, 2nd Edition, Pearson Education.
3. J M Zurada, *Introduction to Artificial Neural Networks*, Jaico Publishing House, Delhi
4. YegnaNarayana, *Artificial Neural Networks*, Prentice Hall India Pvt., Ltd.,

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I M.Tech. (EPS)				
I - Semester	**4**	**-**	**-**	**4**

(10MT10708) POWER QUALITY
(Elective-I)

UNIT-I: Introduction
Introduction of the Power Quality (PQ) problem, Terms used in PQ: Voltage, Sag, Swell, Surges, Harmonics, over voltages, spikes, Voltage fluctuations, Transients, Interruption, overview of power quality phenomenon, Remedies to improve power quality, power quality monitoring

UNIT-II: Long Interruptions
Interruptions – Definition – Difference between failure, outage, Interruptions – causes of Long Interruptions – Origin of Interruptions – Limits for the Interruption frequency – Limits for the interruption duration – costs of Interruption – Overview of Reliability evaluation to power quality, comparison of observations and reliability evaluation.

UNIT-III: Short Interruptions
Short interruptions – definition, origin of short interruptions, basic principle, fuse saving, voltage magnitude events due to re-closing, voltage during the interruption, monitoring of short interruptions, difference between medium and low voltage systems. Multiple events, single phase tripping – voltage and current during fault period, voltage and current at post fault period, stochastic prediction of short interruptions.

UNIT-IV: Voltage sag – characterization:
Voltage sag – definition, causes of voltage sag, voltage sag magnitude, and monitoring, theoretical calculation of voltage sag magnitude, voltage sag calculation in non-radial systems, meshed systems, and voltage sag duration. Three phase faults, phase angle jumps, magnitude and phase angle jumps for three phase unbalanced sags, load influence on voltage sags.

UNIT-V: PQ considerations in Industrial Power Systems:
Voltage sag – equipment behaviour of Power electronic loads, induction motors, synchronous motors, computers, consumer electronics, adjustable speed AC drives and its operation. Mitigation of AC Drives, adjustable speed DC drives and its operation, mitigation methods of DC drives.

UNIT-VI: Mitigation of Interruptions and Voltage Sags:
Overview of mitigation methods – from fault to trip, reducing the number of faults, reducing the fault clearing time changing the power system, installing mitigation equipment, improving equipment immunity, different events and mitigation methods. System equipment interface – voltage source converter, series voltage controller, shunt controller, combined shunt and series controller.

UNIT-VII: Fundamentals of Harmonics

Harmonic Distortion – Voltage verses Current distortion – Harmonics verses Transients – Harmonic Indexes – Harmonic Sources from Commercial Loads – Harmonic Sources from industrial Loads – locating harmonic sources – System response characteristics – effects of harmonic distortion – inter harmonics.

UNIT-VIII: Power Quality Monitoring:

Monitoring Considerations – Historical Perspective of Power Quality measuring Instruments – Power Quality measurement Equipment – Assessment of Power Quality Measurement Data – Application of Intelligent Systems – Power Quality Monitoring Standards.

TEXT BOOKS:

1. Math H J Bollen, *Understanding Power Quality Problems*, IEEE Press.
2. C.Sankaran*, Power Quality*, CRC press

REFERENCE:

1. Roger C. Dugan, Mark E. Mc. Granaghan, Surya Santosoh and H. Wayne Beaty, *Electrical Power Systems Quality*, 2nd Edition, TATA Mc Graw Hill.

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I M.Tech. (EPS)				
I - Semester	**-**	**-**	**3**	**2**

(10MT10709) POWER SYSTEMS AND RELAYS LAB

S. No	Experiment Title
1.	Determination of Sub-transient Reactance of Salient Pole Synchronous Machine.
2.	Determination of Sequence Impedances of Cylindrical Rotor Synchronous Machine.
3.	Fault Analysis – I LG Fault LL Fault
4.	Fault Analysis – II LLG Fault LLLG Fault
5.	Equivalent Circuit of a Three Winding Transformer.
6.	Separation of No-Load Losses of Three-Phase Squirrel Cage Induction Motor.
7.	Power Angle Characteristics of Salient Pole Synchronous Machine.
8.	Scott Connection.
9.	Characteristics of Over Current Relay
10.	Measurement of Dielectric strength of transformer oil using variable electrodes
11.	Characteristics of Over Voltage Relay.
12.	Characteristics of Percentage Biased Differential Relay.
13.	Testing of Frequency Relay
14.	Determination of Sequence components of Salient Pole Synchronous Machine.
15.	Testing of Reverse Power Relay

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(10MT20701) ECONOMIC OPERATION AND CONTROL OF POWER SYSTEM

UNIT-I: **Economic Operation**
Economic operation- Load forecasting - Unit commitment – Economic dispatch problem of thermal units – Gradient method- Newton's method –Base point and participation factor method.

UNIT-II: **Unit Commitment and Solution Methods**
Optimal Unit Commitment, Constraints in unit commitment, Spinning reserve, Thermal Unit Constraints, Other constraints, Hydro constraints, Must Run, Fuel constraints, Unit commitment Solution methods: Priority-List methods, Dynamic Programming solution - Reliability considerations

UNIT-III: Hydrothermal co-ordination
Short-term hydrothermal scheduling problem - gradient approach – Hydro units in series - pumped storage hydro plants-hydro-scheduling using Dynamic programming and linear programming.

UNIT-IV: Automatic generation control
Review of LFC and Economic Dispatch control (EDC) using the three modes of control viz. Flat frequency – tie-line control and tie-line bias control. AGC implementation – AGC features - static and dynamic responses of uncontrolled & controlled two-area system.

UNIT-V: Interchange of Power & Energy
Economic interchange between interconnected utilities – Inter utility energy evaluation – Power pools – Transmission effects and Issues: Limitations - Wheeling

UNIT-VI: **Power Flow problem & its solution**
Formulation of AC Power Flow – Solution Methods: Gauss Siedel, Newton Rhapson & Decoupled Power Flow methods - DC Power Flow Method

UNIT-VII: Power system security
Contingency analysis – linear sensitivity factors – AC power flow methods – contingency selection – concentric relaxation – bounding

UNIT-VIII: **Optimal Power Flow**
Gradient Method & Newton's Method – Linear Sensitivity Analysis – Linear Programming Methods - security constrained optimal power flow – Interior point Algorithm.

TEXT BOOKS:

1. Allen J.Wood and Wollenberg B.F., *Power Generation Operation and control*, 2nd Edition, John Wiley & Sons.
2. Nagrath, I.J. and Kothari D.P., *Modern Power System Analysis*, 3rd Edition, Tata McGraw-Hill, New Delhi.

REFERENCE:

1. D.P. Kothari & J.S. Dhillon, *Power System Optimization*, Printice Hall of India, 2004

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II - Semester	4	-	-	4

(10MT20702) FACTS CONTROLLERS

UNIT-I: FACTS Concepts
Transmission interconnections power flow in an AC system, loading capability limits, Dynamic stability considerations, importance of controllable parameters, basic types of FACTS controllers, and benefits from FACTS controllers.

UNIT-II: Voltage Source Converters and Current Source Converters
Transformer connections for 12 pulse 24 and 48 pulse operation, Three level voltage source converter, pulse width modulation converter, comparison of current source converters with voltage source converters.

UNIT-III: Static Shunt Compensation
Objectives of shunt compensation, mid point voltage regulation voltage instability prevention, improvement of transient stability, Power oscillation damping,

UNIT-IV: Types of VAR Generators
Methods of controllable VAR generation, variable impedance type static VAR generators switching converter type VAR generators hybrid VAR generators.

UNIT-V: SVC and STATCOM
The regulation and slope transfer function and dynamic performance, transient stability enhancement and power oscillation damping operating point control and summary of compensator control.

UNIT-VI: Static Series Compensators
Concept of series capacitive compensation, improvement of transient stability, power oscillation damping, Functional requirements. GTO thyristor controlled series capacitor (GSC), thyristor switched series capacitor (TSSC), and thyristor controlled series capacitor (TCSC) control schemes for GSC, TSSC and TCSC.

UNIT-VII: Phase Angle Regulators
Objectives of Voltage and Phase Angle Regulators, Approaches to Phase Angle Regulators (TCPARs) – Transient stability enhancement and Power Oscillation Damping.

UNIT-VIII: Combined Compensators
UPFC - Basic operating Principles, Conventional Transmission Control Capabilities, Independent Real and Reactive Power Flow Control, Control structure.
IPFC- Basic operating Principles, Control structure.

TEXT BOOKS:

1. Narain G. Hingorani, Laszlo Gyugyi, *Understanding FACTS: Concepts and Technology of Flexible AC Transmission Systems*, Wiley- IEEE Press,1999.
2. R. Mohan Mathur and Rajiv k. varma, *Thyristor based FACTS controllers for Electrical Transmission Systems*, Wiley- IEEE Press, 2002.

REFERENCES:

1. Xiao-Ping, Rehtanz, Christian, Pal, Bikash, *Flexible AC Transmission Systems: Modeling and Control*, Springer, Power Systems Series, 2006.
2. Enrique Acha, Claudio R.Fuerte- Esquivel, Hugo Ambriz-perez,Casar Angeles-Camacho, *Modeling and Simulation in Power Networks*, Wiley - IEEE Press, 2004.

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(10MT20703) H.V.D.C. TRANSMISSION

UNIT-I: Introduction to HVDC Transmission
H.V.DC Transmission: Role of HVAC and HVDC transmission, types of DC links, Power Handling Capabilities of HVDC lines, Basic Conversion principles, static converter configuration.

UNIT-II: Static Power Converter Analysis
Static Power Converters: 3 pulse, 6 pulse & 12 pulse converters, converter station and terminal equipment communication process, Rectifier and inverter operation, equivalent circuit for converter- special futures of converter transformers.

UNIT-III: Harmonics and Filters
Generation of Harmonics in HVDC systems, methods of harmonics elimination, harmonic instability problems, Design of AC & DC filter

UNIT-IV: Control of HVDC Converter and Systems
Control of HVDC converter and systems: Principle of DC link control - constant current, constant extinction angle and constant ignition angle control. Individual phase control and equidistant firing angle control.

UNIT-V: Active and Reactive Power Control
DC power flow control – P.U. System for DC quantities-solution of AC-DC Power flow-Simultaneous method-Sequential method - sources of reactive power – reactive power control – DC power modulation.

UNIT-VI: Multi – Terminal DC Link and Systems
Multi-terminal DC link and systems; series, parallel and series parallel systems, their principle of operation and control.

UNIT-VII: Voltage Interaction between HVAC and HVDC Systems
Voltage interaction – Dynamic voltage regulation – causes for instability – remedies for instability problems.

UNIT-VIII: Transient over Voltages, Faults and Protection
Over voltages due to disturbance on DC side, over voltages due to DC and AC side line faults - Converter faults, over current protection- valve group and DC line protection. Over voltage protection of converters-surge arresters.

TEXT BOOKS:

1. K.R.Padiyar, *High Voltage Direct current Transmission*, Wiely Eastern Ltd.
2. J. Arillaga, *H.V.D.C.Tranmission,* peter peregrilnus Ltd., London UK, 1983
3. E. W. Kimbark, *Direct current Transmission*, John Wiely & sons, New York.

REFERENCES:

1. E.Uhlman, *Power Transmission by Direct Current* Springer Verlag, Berrlin
2. S Rao, *EHVAC, HVDC Transmission & Distribution Engineering*, Khanna Publishers, 2001.

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(10MT20704) POWER SYSTEM RELIABILITY

UNIT–I: **Basic Probability Theory**

Probability Concept, Elements of probability theory, Random variables *(*Continuous*, Discrete Variables)*, Density function and Distribution functions. Mean, SD, Variance. Probability Distributions: Exponential Distribution, Binomial Distribution, Poisson distribution, Normal Distribution, Weibull Distribution, Log Normal Distribution.

UNIT–II: Reliability Functions

Definition of reliability, Component Reliability, Hazard rate, derivation of the Reliability function in terms of the hazard rate, Bath Tub Curve. MTTF, MTTR,MTBF, types of Failures *(early failures, chance failures and wear-out failures).* Reliability Block Diagrams, Series and Parallel configuration. Series-Parallel configuration, High level and low level redundancy

UNIT–III: **Network Modeling**

Reliability evaluation of Non - Series-Parallel configurations. Baye's Theorem Cut-set, Basic Cut-set, Tie-set and Basic Tie set, Minimal Cut-Set, Minimal Tie – set and Decomposition Methods. Deduction of the Minimal Cut sets from the Minimal paths-Stand by redundant Systems-Concept of redundancy, Perfect Switching, Imperfect Switching-Event trees

UNIT–IV: Markov Modeling

Introduction – Markov Process & Markov chain - STPM - Time Dependant probability - functions - Evaluating limiting state probabilities-Absorbing states - Markov process – one component repairable model -Two component repairable model - Three component repairable model.

UNIT–V: Generation System Reliability Analysis

Introduction – Generation system model - Identical units- determination of capacity outage probability table(COPT)- Determination of transitional rates - Non-Identical units- determination of capacity outage probability table - Reducing the states by Combining equal capacity states - Determination of transitional rates -Sequential addition method - Recursive relation for unit addition, unit removal - LOLP , LOLE determination .

UNIT–VI: Frequency & Duration Techniques

Frequency and duration concepts - Two components repairable model (with & without identical components) - Evaluation of cumulative probability & cumulative frequency - Equivalent transition rates – non equivalent transition rates.

UNIT–VII: **Composite System Reliability Analysis**
Two level representation of daily load modeling - Merging of generation and load models – evaluation of probabilities, transitional rates-Decomposition method– Weather effects on transmission lines-circuit breaker model

UNIT–VIII: Distribution System Reliability Analysis (Parallel & Radial Configurations)
Distribution system reliability system analysis - Basic indices - Customer oriented indices - Load and energy indices – Active and Passive failures – open circuit & short circuit failures –preventive maintenance - Problems on above indices.

TEXT BOOKS:

1. Roy Billinton and Ronald N Allen, *Reliability Evaluation of Engineering Systems*, Plenum press, New York and London (BS Publications Revised edition), 1996.
2. Roy Billinton and Ronald N Allen *Reliability Evaluation of Power Systems*, 2nd Edition, Plenum press, New York and London, (BS Publications Revised edition).
3. J. Endrenyi, *Reliability Modeling in Electric Power Systems*, 1st Edition, John Wiley & Sons.

REFERENCES:

1. Charles E. Ebeling, *An Introduction* to *Reliability and Maintainability Engineering*, TATA McGraw Hill, 2002
2. L. Srinath, *Reliability Engineering* TATA McGraw Hill.
3. A. Balaguru Swamy, *Reliability Engineering*, TATA Mc Graw Hill.

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(10MT20705) STATIC AND DIGITAL PROTECTION OF POWER SYSTEM

UNIT-I: **Static Relays**
Advantages of static relays- Basic construction of static relays – Level detectors – Replica impedance-mixing circuits-general equation for two input phase and amplitude comparators –Duality between amplitude and phase comparator.

UNIT-II: Comparators
Amplitude comparators: Circulating current type and opposed voltage type rectifier bridge comparators – Direct and Instantaneous comparators
Phase comparators: coincidence circuit type block spike phase comparator, techniques to measure the period of coincidence – Integrating type – Rectifier and vector product type phase comparators.

UNIT-III: Multi–input comparators
Conic section characteristics – Three input amplitude comparator – Hybrid comparator – switched distance schemes – Polyphase distance schemes-Phase fault scheme –Three phase scheme – combined and ground fault scheme.

UNIT-IV: Over Current and Differential Relays
Static over current relays: Introduction-Instantaneous over current relay – Time over current relays-basic principles-Definite time and Inverse definite time over current relays.
Static Differential Relays: Analysis of static differential relays – static relay schemes –Duo bias transformer differential protection – Harmonic restraint relay.

UNIT-V: Static distance Relays
Static impedance – reactance - MHO and angle impedance relay sampling comparator–realization of reactance and MHO relay using a sampling comparator.
Power Swings: Effect of power swings on the performance of Distance relays - Power swing analysis – Principle of out of step tripping and blocking relays – effect of line length and source impedance on distance relays

UNIT-VI: Microprocessor based protective relays-I
Over current relays – impedance relays – directional relay – reactance relay (Block diagram and flow chart approach only)

UNIT-VII: Microprocessor based protective relays-II
Generalized mathematical expression for distance relays - measurement of resistance and reactance – MHO and offset MHO relays –Realization of MHO characteristics – Realization of offset MHO characteristics (Block diagram and flow chart approach only).

UNIT-VIII: Digital & Numerical Relays

Basic principle of Digital computer relaying, Introduction to Numerical Relays – Advantages.

TEXT BOOKS:

1. T.S. Madhava Rao*, Power system Protection static relay*, 2nd Edition, Tata McGraw Hill Publishing company limited.
2. Badri Ram and D.N. Vishwakarma, *Power system Protection and Switchgear*, 1st Edition, Tata McGraw Hill Publication company limited.

REFERENCE:

1. Bhuvanesh A Oza, Nirmal Kumar C Nair et., al., *Power System Protection and Switchgear*, Tata McGraw Hill

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

I M.Tech. (EPS)	L	T	P	C
II - Semester	4	-	-	4

(10MT20706) ENERGY AUDITING, CONSERVATION & MANAGEMENT (Elective-II)

UNIT-I: Basic principles of Energy audit

Energy audit- definitions, concept , types of audit, energy index, cost index, pie charts, Sankey diagrams , load profiles, Energy conservation schemes - Energy audit of industries- energy saving potential, energy audit of process industry, thermal power station, building energy audit

UNIT-II: Energy management-I

Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting.

UNIT-III: Energy management-II

Energy manger, Qualities and functions, language, Questionnaire - check list for top management

UNIT-IV: Energy Efficient Motors

Energy efficient motors , factors affecting efficiency, loss distribution, constructional details, characteristics - variable speed, variable duty cycle systems, RMS hp- voltage variation-voltage unbalance - over motoring - motor energy audit

UNIT-V: Power Factor Improvement, Lighting

Power factor – methods of improvement, location of capacitors, Pf with non linear loads, effect of harmonics on p.f., p.f motor controllers - Good lighting system design and practice, lighting control, lighting energy audit

UNIT-VI: Energy Instruments

Energy Instruments watt meter, data loggers, thermocouples, pyrometers, lux meters, tongue testers, application of PLC's

UNIT-VII: Economic aspects and analysis

Economics Analysis-Depreciation Methods, time value of money, rate of return, present worth method, replacement analysis, life cycle costing analysis - Energy efficient motors

UNIT-VIII: Computation of Economic Aspects

Calculation of simple payback method, net present worth method - Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.

TEXT BOOKS:

1) W.R. Murphy & G. Mckay Butter worth, *Energy management*, Heinemann publications.
2) Paul o' Callaghan, *Energy Management*, 1st edition, McGraw Hill Book Company.
3) John C. Andreas, *Energy Efficient Electric Motors*, 2nd edition, Marcel Dekker Inc. Ltd.
4) W.C. Turner, *Energy management Hand Book*, John Wiley and sons

I M.Tech. (EPS)	L	T	P	C
II - Semester	4	-	-	4

(10MT20707) POWER SYSTEM DYNAMICS AND STABILITY
(Elective-II)

UNIT-I: Classical Methods
Introduction to the power system stability – Basic concepts and definitions – classification of stability – Synchronous Machine modeling – mathematical description of a synchronous machine – The DQO transformation – equivalent circuits for direct and quadrature axes – steady state analysis – electrical transient performance characteristics – equations of motion.

UNIT-II: Synchronous Machine Control Methods
Excitation systems – Requirement-Voltage and Speed Control overview-Exciter Models-Voltage Regulator models-Turbine Models-Speed Governor Models-Modeling of excitation systems.

UNIT-III: Single Machine Dynamic Models
Terminal Constraints-The Multi-Time Scale Model-Elimination of Stator/Network transients-The Two axis Model-The one Axis(Flux-Decay)Model-The Classical Model-Damping Torques-Synchronous Machine Saturation.

UNIT-IV: Multi-Machine Dynamic Models
The Synchronously Rotating Reference Frame-Network and R-L Load Contraints-Elemination of stator/network Transients-Generalization network and Load Dynamic Models-Multimachine Two axis Model-Multimachine flux decay Model-Multi machine Classical Model-Multimachine Damping Torques-Multimachine models with Saturation-Frequency during Transients-Angle References and an Infinite Bus.

UNIT-V: Multi-Machine Simulation
Differential Algebraic Model-Stator Algebraic Equations-Polar Form-Rectangular form-Alternate form of Stator algebraic Equations-Network Equations-Industry model-Simplification of the Two-Axis Model-Full model (Initial Conditions)-Numerical Solution: Power- Balance Form-SI method –PE Method

UNIT-VI: Small Signal Stability
Small – Signal Stability – fundamental concepts of stability of dynamic systems – Eigen properties of the state matrix – small signal stability of a single machine infinite bus system – effects of excitation system – power system stabilizer – system state matrix with amortisseurs – small signal stability of multi machine systems – special techniques for analysis of very large systems – characteristics small signal stability problems.

UNIT-VII: Load Modeling
Power system loads – Basic load modeling concepts – modeling of Induction motors – Synchronous motor model – acquisition of load – model parameters.

Unit VIII: Energy Function Methods
Physical and Mathematical aspects-Lyapunov's Method-Modeling Issues-Energy Function Formulation-Potential Energy Boundary Surface(PEBS)-The Boundary Controlling method(BCU)-Structure-Preserving Energy Functions.

TEXT BOOKS:

1. Peter W. Sauer & M. A. Pai, *Power System Dynamics and Stability*, Pearson education, 2005
2. M.A. Pai, *Power System Stability Analysis by the direct method of Lyapunov*, North Holland Publishing Company, Newyork, 1981.

REFERENCES:

1. K.R. Padiyar, *Power System Dynamics (Stability & Control)*, 2nd Edition, B.S. Publications.
2. Prabha Kundur, Neal J. Balu, Mark G. Lauby, *Power system stability and control*, 2nd Edition McGraw Hill.
3. P.M. Anderson, A.A. Fouad, *Power System Control and Stability Vol. – I & II*, 1st Edition, Galgotia Publications.

I M.Tech. (EPS)	L	T	P	C
II - Semester	4	-	-	4

(10MT20708) RESTRUCTURED POWER SYSTEM
(Elective-II)

UNIT-I: Key Issues in Electric Utilities
Introduction – Restructuring models – Independent System Operator (ISO) – Power Exchange - Market operations – Market Power – Standard cost – Transmission Pricing – Congestion Pricing – Management of Inter zonal/Intra zonal Congestion.

UNIT-II: Open Access Same-time Information System (OASIS)
Structure of OASIS - Posting of Information – Transfer capability on OASIS.

UNIT-III: Available Transfer Capability (ATC)
Transfer Capability Issues – ATC – TTC – TRM – CBM Calculations – Calculation of ATC based on power flow.

UNIT-IV: Electricity Pricing
Introduction – Electricity Price Volatility Electricity Price Indexes – Challenges to Electricity Pricing – Construction of Forward Price Curves – Short-time Price Forecasting.

UNIT-V: Power System Operation in Competitive Environment
Introduction – Operational Planning Activities of ISO- The ISO in Pool Markets – The ISO in Bilateral Markets – Operational Planning Activities of a GENCO.

UNIT-VI: Market Power
Introduction - Different types of market Power – Mitigation of Market Power - Examples.

UNIT-VII: Transmission Congestion Management
Introduction - Transmission Cost Allocation Methods : Postage Stamp Rate Method - Contract Path Method - MW-Mile Method – Unused Transmission Capacity Method - MVA-Mile method – Comparison of cost allocation methods.

UNIT-VIII: Ancillary Services Management
Introduction – Reactive Power as an Ancillary Service – a Review – Synchronous Generators as Ancillary Service Providers.

REFERENCES:
1. Kankar Bhattacharya, Math H.J. Boller and Jaap E.Daalder Kulwer, *Operation of Restructured Power System*, Academic Publishers, 2001.
2. Mohammad Shahidehpour and Muwaffaq alomoush, *Restructured Electrical Power Systems*, Marcel Dekker Inc., 2001.
3. Loi Lei Lai, *Power System Restructuring and Deregulation*, John Wiley & Sons Ltd., England.

I M.Tech. (EPS)	L	T	P	C
II - Semester	-	-	3	2

(10MT20710) COMPUTER APPLICATIONS IN POWER SYSTEM LAB

1. PSPICE Simulation of Integrator and Differentiator circuits.
2. PSPICE Simulation of three phase full converter using RL and RLE loads.
3. PSPICE Simulation of single phase AC voltage controller using RL load
4. PSPICE Simulation of three phase inverter with PWM controller
5. PSPICE Simulation of resonant pulse commutation circuit
6. Y-Bus / Z-Bus formation using MATLAB
7. Gauss-Seidel load flow analysis using MATLAB
8. Newton Raphson method using MATLAB minimum of 6 bus system
9. Fast decoupled load flow analysis using MATLAB
10. Develop a program to solve swing equation by point by point method using MATLAB
11. Develop a Simulink model for a single area load frequency problem and simulate the same.
12. Develop a PID controller for two-area power system and simulate the same.
13. Stability analysis by using MATLAB
14. Analysis of short circuit studies by using MiPower
15. Transient stability analysis by using MiPower

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

COURSE STRUCTURE

M.Tech. (SE) - I Semester

Subject Code	Course	Periods per week		Credits	Max. Marks		
		L	P		Internal	External	Total
10MT12501	Advanced Data Structures and Algorithms	4	-	4	40	60	100
10MT12502	Advanced Software Engineering	4	-	4	40	60	100
10MT12503	Middleware Technologies	4	-	4	40	60	100
10MT12504	Software Metrics	4	-	4	40	60	100
10MT12505	Software Requirements and Estimation	4	-	4	40	60	100
	Elective-I	4	-	4	40	60	100
10MT12506	Software Process Management						
10MT12507	Software Project Management						
10MT12508	Virtualization and Cloud Computing						
10MT12509	Advanced Data Structures and Algorithms & Middleware Technologies Lab	-	3	2	25	50	75
	TOTAL	24	3	26	265	410	675

M.Tech. (SE) - II Semester

Subject Code	Course	Periods per week		Credits	Max. Marks		
		L	P		Internal	External	Total
10MT22501	Service Oriented Architecture	4	-	4	40	60	100
10MT22502	Software Architecture and Design Patterns	4	-	4	40	60	100
10MT22503	Software Reengineering and Reuse	4	-	4	40	60	100
10MT22504	Software Security Engineering	4	-	4	40	60	100
10MT22505	Software Quality Assurance and Testing	4	-	4	40	60	100
Elective-II		4	-	4	40	60	100
10MT22506	Information Retrieval Systems						
10MT22507	Soft Computing						
10MT22508	Software Reliability						
10MT22509	Industrial Visit/Seminar	-	-	2	50	-	50
10MT22510	Software Testing and Design Patterns Lab	-	3	2	25	50	75
	TOTAL	24	3	28	315	410	725

M.Tech. (SE) - III Semester

Course	Periods per week		Credits	Max. Marks		
	L	P		Internal	External	Total
Project Phase-I	-	-	4	50	-	50

M.Tech. (SE) - IV Semester

Course	Periods per week		Credits	Max. Marks		
	L	P		Internal	External	Total
Project Phase-II	-	-	12	50	100	150

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

(10MT12501) ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT I: Basic Data Structures
Review of Arrays, Stacks, Queues, Circular Queues, Singly Linked Lists, Doubly Linked Lists, Circular Linked Lists, Linked stacks and Linked queues, Terminologies and Applications

UNIT II: Algorithm Analysis
Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs

UNIT III: Trees and Graphs
Introduction, Definition and Basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs-basic concepts, representation and applications , DFS and BFS Traversals

UNIT IV: Binary Search Trees, AVL Trees and Red – Black Trees
Introduction, Binary Search Trees: Definition, Operations and applications, AVL Trees: Definition, Operations and applications, Red – Black Trees: Definition, Operations and applications

UNIT V: B-Trees, Splay Trees and Hash Tables
B-Trees, Splay Trees and its applications, Hash Tables: Introduction, Hash Tables, Hash Functions, Hash Table collision resolution Techniques and its applications

UNIT VI: Divide – and – Conquer & Greedy Method
General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication, Greedy Method**-** General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT VII: Dynamic Programming
General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem

UNIT VIII: Back Tracking and Branch – and – Bound

General Method, 8 – Queen's Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem

TEXT BOOKS:

1. *Data Structures and Algorithms*, G.A.V. Pai, TATA McGraw Hill, 2nd Edn.
2. *Data structures, Algorithms and Applications in C++*, S.Sahni, University press (India) Pvt. Ltd and Orient Longman Pvt. Ltd., 2nd Edn.

REFERENCE BOOKS:

1. *Design and Analysis of Algorithms,* E. Horowitz, S. Sahni, Galgotia Publications, 3rd Edn.
2. *Data Structures and Algorithms in C++*, Drozdek, Thomson Publications, 2nd Edn.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

(10MT12502) ADVANCED SOFTWARE ENGINEERING

UNIT-I
Software and Software Engineering
The Nature of Software, Software characteristics, The Unique Nature of WebApps, Software Engineering, The Software Process, Software Engineering Practice, Software Myths
Software Paradigms
Prespective Process Models, Specialized Process Models

UNIT-II
Unified Process Model
The Unified Process, Personal and Team Process Models, Process Technology, Product and Process
Agile Development
What is Agility? Agility and the Cost of Change, What is an Agile Process? Extreme Programming (XP), Other Agile Process Models, A Tool set for the Agile Process

UNIT-III
Critical Systems
A simple safety-critical system, System dependability, Availability and reliability, Safety, Security
Critical systems specification
Risk-driven specification, Safety specification, Security specification, Software reliability specification
Formal Specification
Formal specification in the software process, Sub-system interface specification, Behavioural specification

UNIT-IV
Software Reuse
The reuse landscape, Design patterns, Generator-based reuse, Application frameworks, Application system reuse
Component-based Software Engineering
Components and component models, The CBSE process, Component composition

UNIT-V
Software Testing
System testing, Component testing, Test case design, Test automation

Software Evolution- Program evolution dynamics, Software maintenance, Evolution Processes, Legacy system evolution

UNIT-VI

Aspect oriented software engineering: The separation of concerns, Aspects, Join points and pointcuts, Software engineering with aspect, Using AOSD to streamline complex systems development without sacrificing flexibility or scalability

Service oriented software engineering: Service-based concepts, modeling and documentation, Service discovery and composition, Service-oriented architecture, Services as reusable components, Software development with services

UNIT-VII

Quality Management

Process and product quality, Quality assurance and standards, Quality Planning, Quality control, Software Measurement and metrics

Process Improvement

Process and product quality, process classification, Process measurement, Process analysis and modeling, Process change, The CMMI process improvement framework

UNIT-VIII

User Interface Design

The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, WebAPP Interface Design, Design Evaluation

TEXT BOOKS:

1. *Software Engineering*, Ian Sommerville, Addison-Wesley,8th Edn.
2. *Software Engineering- A Practitioner's Approach*, Roger S. Pressman, 7th Edn.

REFERENCE BOOKS:

1. *Using UML: Software Engineering with Objects and Components*, Perdita Stevens,Rob Pooley, Addison-Wesley, 2nd Edn.
2. *The Mythical Man-Month : Essays on Software Engineering*, Frederick P., Jr.Brooks, Frederick P. Brooks Jr, Addison-Wesley, 2nd Edn.
3. *The Future of Software Engineering*, Anthony Finkelstein, ACM Press, 1st Edn.
4. Aspect-Oriented Software Development, Robert E. Filman, Tzilla Elrad, SiobhÃin Clarke, Mehmet Aksit, Addison-Wesley, 1st Edn.
5. *Service-Oriented Software System Engineering: Challenges and Practices*, Zoran Stojanovic, Ajantha Dahanayake, IGI Global, 1st Edn.
6. *Software Reuse*, I. Jacobson, M. Griss, and P. Jonsson, ACM Press 2nd Edn.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

(10MT12503) MIDDLEWARE TECHNOLOGIES

UNIT-I
CLIENT/SERVER COMPUTING
Building blocks, types of servers, types of Clients, types of middleware, aspects of client/server systems, sizing, scalability, tiered architecture, client/server models, requirements of client/server systems, Distributed objects, benefits, drawbacks from distributed objects to components

UNIT-II
COMPONENT TECHNOLOGY
Components- definitions, properties, benefits, components and interfaces, direct and indirect interfaces, versions, interfaces as contracts, callbacks, forms of design levels reuse, connection oriented programming, connectable objects

UNIT-III
COMPONENT ARCHITECTURE
Component architecture, component frameworks, composition, data driven, contextual, aspect oriented programming, subject oriented programming, XML components, component development, assembly

UNIT-IV
THE MICROSOFT WAY
Component object model- from COM, COM+, DCOM to .NET framework, evolution, web services technologies, XML, WSDL, UDDI, SOAP

UNIT-V
COMMON LANGUAGE INFRASTRUCTURE
Common language infrastructure- common language Runtime, .NET framework class library, An Overview of the library, Fundamental Namespaces

UNIT- VI
ADO.NET- Using .NET Framework Data Providers, Using Connection and Command Objects, Accessing Data with Data Readers, Accessing Data with Data Sets, ASP.NET enterprise services

UNIT-VII
THE SUN WAY
Component variety- applets, servlets, java beans, enterprise beans, EJB architecture, types of beans, characteristics, Building and deploying distributed applications using EJB, java and web services, JXTA and jinni

UNIT-VIII
THE OMG WAY
System object model, CORBA timeline, CORBA architecture, ORB services, facilities, business objects, IIOP transport mechanisms, IDL, Drawbacks of CORBA
CORBA Component model- POA, CCM components, CCM containers, Meta Object Facility, Comparison of CORBA, .NET and EJB

TEXT BOOKS
1. *Component Software Beyond object oriented Programming*, Clemens szyperski, Dominik Gruntz and Stephan Murer, Pearson education, 3rd Edn.
2. *Understanding .NET*, David Chappell, Pearson education, 3rd Edn.

REFERENCE BOOKS
1. *Client/Server Survival Guide*, Robert Orfali, Dan Harkey, Jeri Edwards, John Wiley India, 3rd Edn.
2. *Enterprise JavaBeans*, Bill Burke, Richard Monson Haefel, O'Reily, 5thEdn.
3. *Client/Server programming with JAVA and CORBA*, Dan harkey, Roberrt Orfali, Wiley India , 2nd Edn.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

(10MT12504) SOFTWARE METRICS

UNIT-I: Measurement
Measurement in Everyday Life, Measurement in Software Engineering, Scope of Software Metrics

UNIT-II: Basics Of Measurement
Representational Theory of Measurement, Measurement and Models, Measurement Scales and Scale Types.

UNIT-III: Goal-Based Frame Work for Software Measurement
Classifying Software Measures, Applying Frame Work, Software Measurement Validation

UNIT-IV: Software Metrics Data Collection
Good Data, Definition of Data, Collecting, Storing and Extracting Data

UNIT-V: Measuring Internal Product Attributes- Size:
Aspects of software size, Length, Reuse, Functionality, Complexity

UNIT-VI: Measuring Internal Product Attributes- Structure:
Types of structural measures, Control-flow structure, Modularity and information flow attributes, Object oriented metrics

UNIT –VII: Measuring External Product Attributes
Modeling Software Quality, Measuring Aspects of Quality

UNIT-VIII: Measurement and Management
Planning a Measurement Program: What is metrics plan, why and what, where and when, How, and who
Measurement in Practice: Success criteria, Measurement in the small, Measurement in the large

TEXT BOOKS:

1. *Software Metrics: A Rigorous and Practical Approach*, Norman.E.Fenton and S.L.Pfleeger, Thomson Computer Press, 2nd Edn.

REFERENCE BOOKS:

1. *Metrics & Models in Software Quality Engineering*, Stephen H. Kan, Pearson Education, 2nd Edn.
2. *Software Metrics-Best practices for successful IT management-Paul Goodman, Rothstein Associates Inc., USA,(2004).*
3. *Software Metrics: A guide to Planning Analysis, and Implementation,*C.Ravindranath Pandian, Auerbach Publications, 1st Edn.
4. *Software Metrics-Best Practices for successful IT management,* Paul Goodman, Rothstein Associates Inc.,USA (2004)

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

(10MT12505) SOFTWARE REQUIREMENTS AND ESTIMATION

UNIT-I
Software Requirements: What And Why: Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

UNIT-II
Software Requirements Engineering; Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality

UNIT-III
Software Requirements Management: Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain

UNIT-IV
Software Estimation: Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation

UNIT-V
Size Estimation-Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures

UNIT-VI
Effort, Schedule And Cost Estimation: What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation

UNIT-VII
Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation

UNIT-VIII

Software Estimation Tools: Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (Software Life Cycle Management) Tools

TEXT BOOKS:

1. *Software Requirements,* Karl E. Weigers,Microsoft Press, 2nd Edn.
2. *Software Requirements and Estimation*, Rajesh Naik and Swapna Kishore, Tata McGraw Hill,1st Edn.

REFERENCE BOOKS:

1. *Managing Software Requirements*, Dean Leffingwell & Don Widrig, Pearson Education, 2nd Edn.
2. *Mastering the requirements process*, Suzanne Robertson and James Robertson, Pearson Education, 2nd Edn.
3. *Estimating Software Costs*, Capers Jones, Tata McGraw-Hill, 2nd Edn.
4. *Practical Software Estimation*, M.A. Parthasarathy, Pearson Education, 1st Edn.
5. *Measuring the software process*, William A. Florac and Anita D. Carleton, Pearson Education, 1st Edn.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

ELECTIVE-I

(10MT12506) SOFTWARE PROCESS MANAGEMENT

UNIT-I: Software Process Maturity
Software Process Maturity Framework: Software Process Improvement, Process Maturity Levels, People in the optimizing process, the need for the Optimizing Process
The principles of Software Process Change: Process in Perspective, Principles, Misconceptions about software Process, A strategy for implementing software Process Change
Software Process Assessment: Overview, Phases, Principles, Assessment Process and Conduct, Implementation Considerations

UNIT-II: Repeatable Process
Managing Software Organizations: Commitment Discipline, the Management System, Establishing a Project Management System
The Project Plan: Principles, Contents, Size Measures, Estimating, Productivity Factors, Scheduling, Project Tracking, the Development Plan, Planning Models, Final Considerations

UNIT-III: Software Configuration Management-I & Software Quality Assurance
SCM-I: The need for configuration Management, Software Product Nomenclature, Basic SCM Functions, Baselines, Configuration Management Responsibilities, The need for Automated Tools
SQA: Quality Management, the Role of SQA, Launching the SQA Program, the SQA Plan, SQA Considerations, SQA People, Independent Verification and Validation

UNIT-IV: Software Standards and Software Inspections
Software Standards: Definitions, Reasons for Standards , benefits of Standards, Examples of Major Standards, Establishing Software Standards, Standards Vs Guidelines
Software Inspections: Types of Reviews, Objectives, Principles, Conduct of Inspections, Training, Reports and Tracking, Other Considerations, Initiating an Inspection Program, Future directions

UNIT-V: Software Testing and SCM Design-II
Software Testing: Definitions, Software Testing Principles, Types of software Tests, Test Planning, Test Development, Test Execution and

Reporting, Test Tools and Methods, Real-Time Testing, The Test Organization

SCM Design Phase: Plan, Questions, Support Functions, Requirement Phase, Design Control, The Implementation Phase, Operational data, The Test Phase, SCM for Tools, Configuration Accounting, Software Configuration Audit

UNIT-VI: Defining the Software Process

Software Process: Standards, Definitions, Levels of software Process Models, Perspective and Descriptive Uses of Models, A Software Process Architecture, Critical Software Process issues, Detailed Process Models, Entity Process Models, Process Model Views, Process Guidelines, Establishing and Using a Process Definition

Software Engineering Process Group: Changing the Software Process, The Role of SEPG, Establishing Standards, the Process Database, Technology Insertion Focal Point, Education and Training, Process Consultation, Process Status and Assessment, Establishing the SEPG

UNIT-VII: Managed Process

Data Gathering and Analysis: Principles, Process, Software Measures, Data Analysis & considerations

Managing Software Quality: Paradigm, Quality Examples and Motivation, Measurement Criteria, Establishing a Software Quality Program, Estimation, Removal Efficiency, Quality Goals and Plans, Tracking and Controlling Software Quality

UNIT-VIII: Optimizing Process

Defect Prevention: Introduction, Principles, Process Changes for Defect Prevention, Considerations, Management's Role

Automating the Software Process: Need, What to Automate, Development Environments, Organizational Plans to Automate, Technology Transition, Special Considerations, Productivity, Justification Considerations

TEXT BOOKS:

1. *Managing the Software Process*, Watts S. Humphrey, Pearson Education, 2nd Edn.

REFERENCE BOOKS:

1. *A Discipline for Software Engineering*, Watts S. Humphrey, Pearson Education, 2nd Edn.
2. *Software Engineering*, A Practioners Approach, Roger S. Pressman, TATA McGraw Hill, 5th Edn.
3. *Introduction to the Team Software Process*, W. S. Humphrey, Pearson Education, 2nd Edn.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

ELECTIVE-I

(10MT12507) SOFTWARE PROJECT MANAGEMENT

UNIT-I
Conventional Software Management : The waterfall model, conventional software Management performance
Evolution of Software Economics : Software Economics, pragmatic software cost estimation

UNIT-II
Improving Software Economics : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections
The old way and the new : The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process

UNIT-III
Life cycle phases : Engineering and production stages, inception, Elaboration, construction, transition phases
Artifacts of the process : The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts

UNIT-IV
Model based software architectures : A Management perspective and technical perspective
Work Flows of the process : Software process workflows, Iteration workflows

UNIT-V
Checkpoints of the process : Major mile stones, Minor Milestones, Periodic status assessments
Iterative Process Planning : Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning

UNIT-VI
Project Organizations and Responsibilities : Line-of-Business Organizations, Project Organizations, evolution of Organizations
Process Automation : Automation Building blocks, The Project Environment

UNIT-VII

Project Control and Process instrumentation : The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation

Tailoring the Process : Process discriminates

UNIT-VIII

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions

Case Study: The command Center Processing and Display system-Replacement (CCPDS-R)

TEXT BOOKS:

1. *Software Project Management*, Walker Royce, Pearson Education,6thEdn.

REFERENCE BOOKS:

1. *Software Project Management*, Bob Hughes and Mike Cotterell, Tata McGraw-Hill, 4th Edn.
2. *Software Project Management*, Joel Henry, Pearson Education, 1st Edn.
3. *Software Project Management in practice*, Pankaj Jalote, Pearson Education, 1st Edn.

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M. Tech.(SE) **L T P C**
I Semester **4 0 0 4**

ELECTIVE-I

(10MT12508) VIRTUALIZATION AND CLOUD COMPUTING

UNIT-I
Introduction to Virtualization - Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as a service – SaaS, grid computing, utility computing, virtualization processes

UNIT-II
Virtualization Technologies-I - ubuntu (server edition),altiris, windows, server, software virtualization, vmware, intel virtualization, red hat virtualization, softgrid application, Linux virtualization,desktop,virtualization,hardware virtualization, resource virtualization, processor virtualization, application virtualization

UNIT-III
Virtualization Technologies-II - Storage virtualization, virtualization density, para-virtualization, OS virtualization, virtualization software, data storage virtualization, Intel virtualization technology,thinstall virtualization suite, net framework virtualization, windows virtualization on fedora, storage virtualization technologies, virtualization level, security monitoring and virtualization, oracle virtualization

UNIT-IV
Virtualization and Storage Management - The heart of cloud computing -virtualization, defining virtualization, why virtualize,what can be virtualized, where does virtualization happen, how does virtualization happen, on the road to storage virtualization, improving availability using virtualization, improving performance through virtualization, improving capacity through virtualization, business value for virtualization

UNIT-V
Introduction to Cloud Computing – Cloud Introduction and overview- Components, Infrastructure and Services, Why Use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology- Hardware & Software Infrastructure

UNIT-VI

Cloud Computing Architecture- Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, and Distributed Computing

UNIT-VII

Security – Security issues in Cloud Computing - Data Security, Network Security, and Host Security

UNIT-VIII

Disaster Recovery- Disaster Recovery Planning, Disasters in the Cloud, Disaster Management. Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale

Case Studies: Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE

TEXT BOOKS:

1. *Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book*, Ivanka Menken , Gerard Blokdijk, (2009)
2. *Cloud Application Architectures Building Applications and Infrastructure in the Cloud,* George Reese, Publisher: O'Reilly Media Press, (2009)

REFERENCE BOOKS:

1. *Cloud Computing: A Practical Aprroach*, Anthony T.Velte, Tobe J.Velte, Robert Elsenpeter, Publication Person Education, (2009)
2. *Storage Virtualization: Technologies for Simplifying Data Storage and Management,* Tom Clark, Addison-Wesley, (2005)
3. *Cloud Computing Technologies and Strategies of the Ubiquitous Data Center,* Curtis Franklin Jr.Brian J.S. Chee (2010)
4. *Introduction to Cloud Computing: Business & Technology*, Timothy Chou (2009)

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M. Tech.(SE) **L T P C**
I Semester **0 0 3 2**

(10MT12509) ADVANCED DATA STRUCTURES AND ALGORITHMS
&
MIDDLEWARE TECHNOLOGIES LAB

Data Structures Lab

1. Write C++ programs to implement the following using an array.
   a) Stack ADT b) Queue ADT

2. Write C++ programs to implement the following using a singly linked list.
   a) Stack ADT b) Queue ADT

3. Write C++ programs to implement the deque (double ended queue) ADTusing a doubly linked list and an Array.

4. Write a C++ program to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from a binary search tree.
   c) Search for a key element in a binary search tree.

5. Write C++ programs that use recursive functions to traverse the given binary tree in
   a) Preorder b) inorder and c) postorder

6. Write C++ programs that use non-recursive functions to traverse the given binary tree in
   a) Preorder b) Inorder and c) Postorder.

7. Write C++ programs for the implementation of bfs and dfs for a given graph.

8. Write C++ programs for implementing the following sorting methods:
   a) Merge sort b) Heap sort

9. Write a C++ program to perform the following operations
   a) Insertion into a B-tree
   b) Deletion from a B-tree
10. Write a C++ program to perform the following operation
   a) Insertion into an AVL - tree
   b) Deletion from an AVL – tree

11. Write a C++ program to implement All Pairs Shortest Path.

12. Write a C++ program for implementing 8 Queen's problem.

Middleware Technologies Lab

1. Write an arithmetic operations calculator web application program using ASP.NET
2. Write a client/server arithmetic operations calculator program using java RMI
3. Write a client/server Stock market java program using java RMI
4. Write a client/server address book java program using java RMI
5. Write a program to create various forms to store customer data, delete customer data, update customer data, retrieve customer data using ASP.NET and MS-ACCESS database
6. Write a program to create various forms to maintain the Super market using ASP.NET and MS-ACCESS database
7. Write an address book program using ASP.NET and MS-ACCESS database
8. Write a client/server arithmetic operations calculator program using CORBA
9. Write a client/server Stock market java program using CORBA
10. Write a client/server address book java program using CORBA

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

(10MT22501) SERVICE ORIENTED ARCHITECTURE

UNIT-I
SOA and Web Services Fundamentals
Introducing SOA- Fundamental SOA, Common Characteristics of Contemporary SOA, Common tangible benefits of SOA, Common pitfalls of adopting SOA, The Evolution of SOA, An SOA timeline, The continuing evolution of SOA, The roots of SOA

UNIT-II
Web Services and primitive SOA - The Web Services frame work, Services, Service descriptions, Messaging, Web Services and Contemporary SOA(Part I-Activity management and Composition) Message exchange patterns, Service Activity Coordination, Atomic transactions, Business Activities, Orchestration, Choreography

UNIT-III
Web Services and Contemporary SOA (Part-II-Advanced Messaging, Metadata, and Security) Addressing, Reliable messaging, Correlation, Policies, Metadata exchange, Security, Notification and eventing

UNIT-IV
Principles of Service-Orientation
Service – Orientation and the enterprise, Anatomy of SOA, Common Principles of Service – Orientation, interrelation between Principles of Service-Orientation, Service Orientation and Object Orientation, Native Web Services support for Principles of Service-Orientation

UNIT-V
Service Layers
Service-Orientation and Contemporary SOA, Service Layer abstraction, Application Service Layer, Business Service Layer, Orchestration Service Layer, Agnostic Services, Service Layer Configuration Scenarios, SOA Delivery Strategies, SOA delivery lifecycle phases, The top-down strategy, The bottom-up strategy, The agile strategy

UNIT-VI
Service Oriented Analysis (Part I-Introduction)-Introduction to Service Oriented Analysis, Benefits of a Business Centric SOA, Deriving Business Services.

Service Oriented Analysis (Part-II-Service Modelling)-Service Modelling, Service Modelling guidelines, Classifying Service model logic, Contrasting Service modelling approaches

UNIT-VII

Building SOA (Technology and Design)

Service Oriented Design(Part I-Introduction)-Introduction to Service-Oriented design, WSDL related XML Schema language basics, WSDL language basics, Service interface design tools

Service Oriented Design(Part II-SOA Composition Guidelines)-SOA Composing steps, Considerations for choosing service layers, Considerations for positioning core SOA standards, Considerations for choosing SOA extensions

Service Oriented Design(Part III- Service Design) Service Design overview, Entity-centric business Service Design, Application Service Design, Task-centric business Service Design, Service Design guidelines

UNIT-VIII

Service Oriented Design (Part IV-Business Process Design)-WS-BPEL language basics, WS- Coordination overview, Service Oriented Business process Design, Fundamental WS-* Extensions, WS-Addressing language basics, WS-Reliable Messaging language basics, WS-Policy language basics, WS-Metadata Exchange language basics, WS-Security language basics

TEXT BOOKS:

1. *Service-Oriented Architecture-Concepts, Technology, and Design*, Thomas Erl, Pearson Education, 1st Edn.
2. *Understanding SOA with Web Services*, Eric Newcomer, Greg Lomow, Pearson Education, 1st Edn.

REFERENCE BOOKS:

1. *The Definitive guide to SOA*, Jeff Davies & others, Apress, Dreamtech Press, (2007)
2. *Java SOA Cook book*, E.Hewitt, O'REILLY, (2009)
3. *SOA in Practice*, N.M.Josuttis, O'REILLY, (2007)
4. *Applied SOA*, M.Rosen and others, Wiley India pvt. Ltd, (2009)
5. *Java Web Services Architecture*, J.Mc Govern, and others, Morgan Kaufmann Publishers, Elsevier (2003)
6. *SOA for Enterprise Applications*, Shankar.K, Wiley India Edition (2008)
7. *SOA-Based Enterprise Integration*, W.Roshen, TATA McGraw Hill, (2009)
8. *SOA Security*, K.Rama Rao, C.Prasad, Dreamtech press (2007)

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

(10MT22502) SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

UNIT-I
Envisioning Architecture
What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views and the Architecture Business Cycle

UNIT-II
Creating an Architecture
Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture

UNIT-III
Analyzing Architectures
Architecture Evaluation, Architecture design decision making, Architecture Tradeoff Analysis Method (ATAM), Cost Benefit Analysis Method (CBAM)

UNIT-IV
Moving from one system to many
Software Product Lines, Building systems from off the shelf components, Software architecture in future

UNIT-V
Introduction to Design Patterns
What is Design Pattern, Pattern Description, Organizing catalogs, Role in solving design problems, Selection and Usage

UNIT-VI
Creational and Structural patterns
Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, decorator, façade, flyweight, proxy

UNIT-VII
Behavioral patterns
Chain of responsibility, command, interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor

UNIT-VIII

Case Studies

Lexi Editor in Design Patterns, A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

TEXT BOOKS:

1. *Software Architecture in Practice, second edition*, Len Bass, Paul Clements & Rick Kazman, Pearson Education (2003)
2. *Design Patterns*, Erich Gamma, Pearson Education (1995)

REFERENCE BOOKS:

1. *Software Architecture*, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR (2001)
2. *Head First Design patterns*, Eric Freeman & Elisabeth Freeman, O'REILLY (2007)
3. *Design Patterns in Java,* Steven John Metsker & William C. Wake, Pearson education (2006)

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

(10MT22503) SOFTWARE REENGINEERING AND REUSE

UNIT-I
Legacy software structure, Software reengineering process model:
Software maintenance: The maintenance Process, Estimation of maintenance costs, Software change strategies include: Software maintenance, Architectural transformation, Software reengineering.
Legacy software structure and distribution: Ideal structure, Real structure, Layered distribution model, Legacy software distribution, Architectural problems
Business process reengineering: Business processes, A BPR Model

UNIT-II
Design Extraction:
Reverse Engineering: Goals of reverse engineering, Reverse engineering process, Reverse engineering to understand processing, Code duplication detection, Reverse engineering to understand data, Reverse engineering user interfaces, Tools for reverse engineering
Software reengineering and its importance, Goals of reengineering, A software reengineering process model, Software reengineering activities

UNIT-III
Restructuring (In Traditional context): Code restructuring: Characteristics of unstructured code, Characteristics of structured code, Spaghetti logic, Structured control logic, Restructuring problems, Data restructuring (Data reengineering): Data reengineering process, Data problems, Approaches: Data cleanup, Data extension, Data migration. Tools for restructuring

UNIT-IV
Refactoring (Restructuring in object oriented context): What is refactoring?, Principles in refactoring: Why should you refactor?, When should you refactor?, Problems with refactoring, Refactoring and design, Refactoring and performance. Refactoring opportunities, Top ten of code bad smells, Different refactorings and their use, Refactoring tools

UNIT-V
Forward Engineering: What is forward engineering? Goals of forward engineering, Forward engineering for client/server

applications, Forward engineering for object oriented architectures, Forward engineering user interfaces, Tools for forward engineering

UNIT-VI

Introducing the Reuse-Driven Software Engineering Business: Software Reuse Success Factors, Reuse Driven Software Engineering is a Business

Architecture Style-I: Object-Oriented Software Engineering, Application and Component Systems

UNIT-VII

Architecture Style-II-Use case Components, Object Components, Layered Architecture

UNIT-VIII

Processes: Application Family Engineering, Component System Engineering, Application System Engineering

TEXT BOOKS:

1. *Software Engineering*, Ian Sommerville, Addison-Wesley, 6th Edn.
2. *Software Engineering, A Practitioner's Approach*, Roger S. Pressman, 6th Edn.
3. *Software Reuse: Architecture, Process and Organization for Business Success*, Ivar Jacobson, Martin Griss, Patrik Jonsson, Pearson Education, 2nd Edn.

REFERENCE BOOKS:

1. *Software Reengineering*, Ed. Robert S. Arnold, IEEE Computer Society, 1993.
2. *Software Evolution*, Tom Mens, Serge Demeyer, Springer publication company, (2008)
3. *Refactoring: Improving the Design of Existing Code*, Martin Fowler, K.Beck, J.Brant, W.Opdyke, D.Roberts, Addison-Wesley, NY (1999)
4. *Software Reengineering*, Georg Abfalter, VDM Verlag, Germany (2008)
5. *Successful Software Reengineering*, Salvatore Valenti, IRM Press (2002)
6. *Logical construction of programs*, J.D.Warnier,Van Nostrand-Reinhold,(1974)
7. *Tutorial on Software Restructuring*, Robert E.Arnold, IEEE Computer Society, (1986)

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

(10MT22504) SOFTWARE SECURITY ENGINEERING

UNIT-I
Why is Security a Software Issue?
Introduction, The problem, Software assurance and software security, Threats to software security, Sources of software insecurity, the benefits of detecting software security defects early, managing secure software development

UNIT-II
What Makes Software Secure?
Defining properties of secure software, How to influence the security properties of software, How to assert and specify desired security properties

UNIT-III
Requirements Engineering for Secure Software
Introduction, Misuse and Abuse cases, The SQUARE process model, SQUARE sample outputs, Requirements elicitation, Requirements prioritization

UNIT-IV
Secure Software Architecture and Design
Introduction, Software security practices for architecture and design: Architectural risk analysis, Software security knowledge for architecture and design: Security principles, Security guidelines, and Attack patterns

UNIT-V
Considerations for Secure Coding and Testing
Introduction, Code analysis, Coding practices, Software security testing, Security testing considerations throughout the SDLC

UNIT-VI
Security and Complexity: System Assembly Challenges
Introduction, Security failures, Functional and attacker perspectives for security analysis, System complexity drivers and security

UNIT-VII

Governance, and Managing for More Secure Software

Governance and security, Adopting an enterprise software security framework, How much security is enough? Security and project management

UNIT-VIII

Security metrics

Defining security metrics, Diagnosing problems and measuring technical security

TEXT BOOKS:

1. *Software Security Engineering: A Guide for Project Managers*, Julia H. Allen, Sean Barnum, Robert J. Ellison, Gary McGraw, and Nancy R. Mead, Pearson Education (2009)
8. *Security Metrics: Replacing Fear, Uncertainty, and Doubt*, Andrew Jaquith, Addison- Wesley (2007)

REFERENCE BOOKS:

1. *Software Security: Building Security In*, Gary McGraw, Addison-Wesley (2006)
2. *The Art of Software Security Assessment: Identifying and Preventing Software Vulnerabilities,* Mark Dowd, John McDonald, Justin Schuh, Addison-Wesley,1st Edn.
3. *Building Secure Software: How to Avoid Security Problems the Right Way*, John Viega,Gary McGraw, Addison-Wesley (2001)
4. *Exploiting Software: How to break code*, G. Hoglund, G. McGraw,Addison Wesley,(2004)

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

(10MT22505) SOFTWARE QUALITY ASSURANCE AND TESTING

UNIT-I: Software Quality Assurance Framework: What is Quality? Prevention versus Detection, Verification versus Validation, Software Quality Assurance, Components of Software Quality Assurance, **Software Quality Assurance Plan**- Steps to develop and implement a Software Quality Assurance Plan, **Quality Standards**: ISO 9000, CMM, People CMM, CMMI, Malcolm Baldrige National Quality Award, 3 Sigma, 6 Sigma

UNIT-II: Software Quality Metrics Overview
Product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metrics Programs, Collecting Software Engineering Data

UNIT-III: The Software Quality Metrics Methodology: Establish Software quality requirements, Identify Software quality metrics, implement the software quality metrics, analyze the software metrics results, validate the software quality metrics
Software quality indicators, Fundamentals of Measurement theory

UNIT-IV: Building a Software Testing Strategy
Economics of System Development Life Cycle (SDLC) Testing, Testing-an Organizational Issue, Establishing a Testing policy, structured approach to testing, Test Strategy, Testing methodology, Status of software Testing

UNIT-V: Establishing a Software Testing Methodology
Testing Purpose, Defects hard to find, reduce the cost of Testing, verification and validation, functional and structural testing, workbench concept, Eight considerations in developing testing methodologies, Testing tactics checklist

UNIT-VI: Software Testing Techniques
Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing

UNIT-VII: Software Testing Tools
Taxonomy of Software Testing Tools, Methodology to evaluate automated testing tools, Win runner, QTP, Load Runner, SQA Robot, Silk test, JMeter, JUNIT and Cactus

UNIT-VIII: The Eleven-Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes, Evaluate Test Effectiveness

Testing Specialized Systems and Applications
Testing Client/Server Systems, Testing Web-based systems, testing off-the-Shelf Software, Testing a Data Warehouse

TEXT BOOKS:

1. *Software Testing and continuous Quality Improvement*, William E.Lewis, An Auerbach Publication,3rd Edn.(2009)
2. *Effective Methods for Software Testing*, William E. Perry, Wiley India, 2ndEdn.(2006)

REFERENCE BOOKS:

1. *Software Testing Techniques*, Bories Beizer, Dreamtech Press, 2ndEdn.
2. *Software Testing Tools*, Dr.K.V.K.K. Prasad, Dream tech press (2005)
3. *Handbook of Software Quality Assurance*, G.Gordon Schulmeyer, Artech House Publishers, 4th Edn.
4. *Metrics and Models in Software Quality Engineering*, by Stephen H. Kan,Pearson Education Publication, 2nd Edn.

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

ELECTIVE-II

(10MT22506) INFORMATION RETRIEVAL SYSTEMS

UNIT-I
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses

UNIT-II
Information Retrieval System Capabilities: Search, Browse, Miscellaneous

UNIT-III
Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction

UNIT-IV
Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure

UNIT-V
Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

UNIT-VI
Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters

UNIT-VII
User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext
Information Visualization: Introduction, Cognition and perception, Information visualization technologies

UNIT-VIII
Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results

TEXT BOOKS:

1. *Information Retrieval Systems: Theory and Implementation* Kowalski,Gerald, Mark T Maybury:, Kluwer Academic Press (1997)

REFERENCE BOOKS:

1. *Information Retrieval Data Structures and Algorithms* Frakes, W.B.,Ricardo Baeza-Yates:, Prentice Hall (1992)
2. *Modern Information Retrival,* Yates Pearson Education (2007)
3. *Information Storage and Retieval*, Robert Korfhage, John Wiley and sons (1997)

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

ELECTIVE-II

(10MT22507) SOFT COMPUTING

UNIT-I
Introduction to intelligent systems and soft computing
Introduction, Intelligent systems, Knowledge-based systems, Knowledge representation and Processing, soft computing

UNIT-II
Fundamentals of Fuzzy Logic Systems
Introduction, Background, Fuzzy sets, Fuzzy logic operations, Generalized fuzzy operations, Implication (if-then), Some definitions, Fuzziness and Fuzzy resolution, Fuzzy relations, Composition and Inference, considerations of fuzzy decision-making

UNIT-III
Fuzzy Logic Control
Introduction, Background, Basic of Fuzzy control, Defuzzification, Fuzzification, Fuzzy Control Surface, Extensions of Mamdani fuzzy control

UNIT-IV
Fuzzy Control Architectures
Fuzzy control architectures, Properties of fuzzy control, Robustness and Stability

UNIT-V
Fundamentals of Artificial Neural Networks
Introduction, Learning and acquisition of knowledge, Features of artificial Neural Networks, Fundamentals of Connectionist Modeling
Major Classes of Neural Networks
Introduction, The Multilayer Perceptron

UNIT-VI
Neuro-Fuzzy Systems
Introduction, Background, Architectures of neuron-fuzzy systems, Construction of neuron-fuzzy systems

UNIT-VII

Evolutionary Computing

Introduction, Overview of evolutionary computing, Genetic algorithms and optimization, The schema theorem: the fundamental theorem of genetic algorithms, Genetic algorithm operators, Integration of genetic algorithms with neural networks, Integration of genetic algorithms with fuzzy logic, Known issues in GAs, Population-based incremental learning, Evolutionary strategies, ES applications

UNIT-VIII

Applications

Pattern Recognition, Image Processing, Information Retrieval Systems, Share Market Analysis, Soft Computing for Colour Recipe Prediction

TEXT BOOKS:

1. *Soft Computing and Intelligent Systems Design*, Fakhreddine.O. Karray and Clarence De Silva, Pearson Education.
2. *Neuro-Fuzzy and Soft Computing*, J.S.R. Jang, C.T. Sun and E.Mizutani, Pearson Education (2004)

REFERENCE BOOKS:

1. *Fuzzy Logic with Engineering Applications,* Timothy J. Ross, McGraw-Hill, (1997)
2. *Computational Intelligence Principles, Techniques and Applications,* A.Konar, Springer (2005)
3. *Introduction to Pattern Recognition- Statistical, Structural, Neural and Fuzzy Logic Approaches*, M.Friedman and Abraham Kandal, World Scientific (2005)

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M. Tech.(SE) **L T P C**
II Semester **4 0 0 4**

ELECTIVE-II

(10MT22508) SOFTWARE RELIABILITY

UNIT-I

Introduction

The Need for Reliable Software, Software Reliability Engineering Concepts, Basic definitions, Software practitioners biggest problem, software reliability engineering approach, software reliability engineering process, defining the product

UNIT-II

The Operational Profile

Reliability concepts, software reliability and hardware reliability, developing operational profiles, applying operational profiles, learning operations and run concepts.

UNIT-III

Software Reliability Concepts

Defining failure for the product, common measure for all associated systems, setting system failure intensity objectives, determining develop software failure intensity objectives, software reliability strategies, failures, faults and errors, availability, system and component reliabilities and failure intensities, predicting basic failure intensity.

UNIT-IV

Software Reliability Modeling Survey

Introduction, Historical Perspective and Implementation, Exponential Failure Time Class of Models, Weibull and Gamma Failure Time Class of Models, Infinite Failure Category Models, Bayesian Models, Model Relationship, Software Reliability Prediction in Early Phases of the Life Cycle

UNIT-V

Software Metrics for Reliability Assessment

Introduction, Static Program Complexity, Dynamic Program Complexity, Software Complexity and Software Quality, Software Reliability Modeling

UNIT-VI

Software Testing and Reliability

Introduction, Overview of Software Testing, Operational profiles, Time/Structure Based Software Reliability Estimation

UNIT-VII

Best Practice of SRE

Benefits and approaches of SRE, SRE during requirements phase, SRE during implementation phase, SRE during Maintenance phase

UNIT-VIII

Neural Networks for Software Reliability

Introduction, Neural Networks, Neural Networks for software reliability, software reliability growth modeling

TEXT BOOKS:

1. *Handbook of Software Reliability Engineering,* Michael R. Lyu, published by IEEE Computer Society Press and McGraw-Hill Book Company (1996)
2. *Software Reliability Engineering,* John D. Musa, Tata McGraw-Hill, 2nd Edn.

REFERENCE BOOKS:

1. *Practical Reliability Engineering*, Patric D. T. O connor, John Wesley & Sons, 4th Edn.
2. *Fault tolerance principles and Practice*, Anderson and PA Lee, PHI (1981)
3. *Fault tolerant computing-Theory and Techniques*, Pradhan D K (Ed.): Vol 1 and Vol 2, Prentice hall (1986)
4. *Reliability Engineering,* E. Balagurusamy, Tata McGrawHill (1994)

SREE VIDYANIKETHAN ENGINEERING COLLEGE
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M. Tech.(SE) **L T P C**
II Semester **0 0 3 2**

(10MT22510) SOFTWARE TESTING AND DESIGN PATTERNS LAB

Software Testing:

A. LAB EXPERIMENTS USING WINRUNNER

1. Testing Flight Reservation Application Functional specifications:

i) The width of the GUI object "***Name***" in the Flight Reservation window must be 150

ii) The height of the GUI object "***Order no***" in the open order window must be 20

iii) **The flight schedule frame** of Flight Reservation window should have the following properties

a) Height - 283
b) Width - 138
c) X - 11
d) Y - 84

iv) **The order information frame** of Flight Reservation window should have the following properties

a) Height - 283
b) Width - 252
c) X - 155
d) Y - 84

v) It is sufficient to verify **X or Y** Axis, both properties are not necessary.

2. Testing standard Calculator Application

i) Test the inverse operation (inverse of 4,5 using 1/x button)

Test Case	Expected Output
4 , 1/x	0.25
5 , 1/x	0.2

ii) Test the operations "square root of -6 and square root of 4 "

Test Case	Expected Output
-6 , sqrt	Err: "Invalid Input for function"
4 , sqrt	2

iii) Clear the display after performing some arithmetic operations

Test Case	Expected Output
4+5=9 , C	Clears the display
5*3=15 , C	Clears the display

iv) Test the multiplication of two numbers

Test Case	Expected Output
1.2 * 3	3.6
15 * 3	45

v) Test the Division of two numbers

Test Case	Expected Output
5/2.0	2.5
4/2	2

vi) Test the operations "7+8-9" and "15*3-10"

Test Case	Expected Output
7+8-9	6
15*3-10	35

vii) Test the operations "2% of 600" and "8% of 700"

Test Case	Expected Output
600 * 2%	12
700 * 8%	56

viii) Test the Buttons "MR" and "MS"

Test Case	Expected Output
2 , MS , C , MR	2
5*3=15, MS , C , MR	15

ix) Test the Buttons "M+" and "MR"

Test Case	Expected Output
MC,2,M+,3,M+,C,MR	5
MC,9,M+,5,M+,C,MR	14

x) Test the Buttons "MC" and "Backspace"

Test Case	Expected Output
9,MS,C,MR,MC,C,MR	0
4*5=20,MS,C,MR,MC,C,MR	0
856,backspace(3 times)	0

3. Testing Employee Database Application

i) Test the EMPDB Application with suitable operations

ii) Implementation of *Checkpoints*

iii) Implementation of *Call* Function

B. LAB EXPERIMENTS USING QUICK TEST PROFESSIONAL

i) Testing Caluculator, EMP DB,Flight Reservation Applications

ii) Implementation of Checkpoints Using QTP

iii) Implementation of Data Driven Testing in QTP

iv) Testing a Web Application Using QTP

v) Synchronization of test cases in QTP

Design Patterns:

1. Write a C++ Program to perform Abstract Factory Design pattern.
2. Write a C++ Program to perform Singleton Design pattern.
3. Write a C++ Program to perform Adapter Design pattern.
4. Write a C++ Program to perform Composite Design pattern.
5. Write a C++ Program to perform Proxy Design pattern.
6. Write a C++ Program to perform Command Design pattern.
7. Write a C++ Program to perform Mediator Design pattern.
8. Write a C++ Program to perform State Design pattern.
9. Write a C++ Program to perform Strategy Design pattern
10. Write a C++ Program to perform Visitor Design pattern.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet-517 102

DEPARTMENT OF BIOTECHNOLOGY
M.Tech Biotechnology

I SEMESTER

Subject Code	Course	Periods per week		Credits	Max. Marks		
		L	P		Int.	Ext.	Total
	Theory						
10MT10301	General Microbiology and Biochemistry	4	-	4	40	60	100
10MT10302	Molecular biology	4	-	4	40	60	100
10MT10303	Microbial Engineering	4	-	4	40	60	100
10MT10304	Immunology	4	-	4	40	60	100
10MT10305	Process Engineering Principles	4	-	4	40	60	100
	Elective – I	4	-	4	40	60	100
10MT10306	Analytical techniques in Biotechnology						
10MT10307	Enzyme Engineering and technology						
10MT10308	Food process and technology						
10MT10309	Metabolic regulation						
	Laboratory						
10MT10310	Process Engineering Principles/ Microbiology and Biochemistry Lab	-	3	2	25	50	75
TOTAL		24	3	26	265	410	675

II SEMESTER

Subject Code	Course	Periods per week		Credits	Max. Marks		
		L	P		Int.	Ext.	Total
	Theory						
10MT20301	Bioreactor Engineering	4	-	4	40	60	100
10MT20302	Genetic Engineering	4	-	4	40	60	100
10MT20303	Bioseparation processes	4	-	4	40	60	100
10MT20304	Cell Technology	4	-	4	40	60	100
10MT20305	Bioinformatics	4	-	4	40	60	100
	Elective - II	4	-	4	40	60	100
10MT20306	Advanced Immunotechnology						
10MT20307	Plant biotechnology						
10MT20308	Environmental biotechnology						
10MT20309	Nano-Biotechnology						
10MT20310	Industrial Visit*	-	-	2	50	-	50
	Laboratory						
10MT20311	Bioprocess Engineering/ Genetic Engineering lab	-	3	2	25	50	75
TOTAL		24	3	28	315	410	725

*Industrial Visit not less than for 2 weeks. A 5 Day week with 6-8 Hours per day on an average.

III – SEMESTER

Subject Code	Course	Periods per week		Credits	Max. Marks		
		L	P		Int.	Ext.	Total
10MT30301	Project Work Phase-I	-	-	4	50	-	50
TOTAL		-	-	4	50	-	50

IV – SEMESTER

Subject Code	Course	Periods per week		Credits	Max. Marks		
		L	P		Int.	Ext.	Total
10MT40301	Project Work Phase-II	-	-	12	50	100	150
TOTAL		-	-	12	50	100	150

Summary:

The M.Tech Programme is evaluated for 70 Credits & 1600 Marks.
The Candidate has to earn 70 Credits for the award of the Degree

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

(10MT10301) GENERAL MICROBIOLOGY AND BIOCHEMISTRY

L	P	C
4	-	4

UNIT I

Historical background and Scope of microbiology. Development of pure culture methods: Enrichment culture methods, Pure culture techniques, Theory and practice of sterilization; Principles of microbial nutrition, Construction of culture media; Enrichment culture techniques for isolation of chemoautotrophs, chemoheterotrophs and photosynthetic microorganisms. Structure and classification of viruses and Replication of bacteriophages. Replication of animal viruses. A note on SV40 and Retroviruses in transformation.

UNIT II

Microbial Growth - The definition of Growth, Bacterial generation time, specific growth rate and yield measurement, Monoauxic, Diauxic and synchronized growth curve. Factors affecting microbial growth.

UNIT III

Classification of Bacteria - Basic principle and techniques used in bacterial classification; Phylogenetic polyphasic taxonomy and numerical taxonomy; New approaches of bacterial taxonomic classification including genetic methods, Ribosomal RNA sequencing characteristic of primary domains.

UNIT IV

Cell Structure And Microbial Diversity - Structural differences between different microbial cell types and cellular organelles; Biochemical methods used to differentiate between Archae, Eubacteria and Eukaryotes. Cell wall of prokaryotes.

UNIT V

Biomolecules - Carbohydrates, Classification of carbohydrates, Lipids, and functions. Protein structure and function, Nucleic acids - structure and function.

UNIT VI

Organization Of Macromolecules & Microbial Nutrition - Importance of non-covalent interactions in biological systems; Different types of culture medium; C/N/P balance and making of culture medium.

UNIT VII

Bioenergetics and Catabolic Pathways- Oxidation-reduction reactions; Electron carriers and cellular metabolism; High energy compounds and their role in microbial fermentations; Enzymes as catalysts; Cellular metabolites and interconnectivity in biochemical pathways, Respiration and Electron Transport.

UNIT VIII

Microbes For Human Welfare - Mycobacteria, Enterobacteria, Anaerobes, Soil bacteria, VAM, Trichoderma, Agrobacterium, Nitrogen fixation. Industrially important microbes: secondary metabolites, biotransformations, ethanol production.

TEXT BOOKS:

1. Prescott, Harley & Klein, *Microbiology,* McGraw-hill, 7th edition,1996.
2. A.H. Patel, *Industrial Microbiology*, Macmillan India Ltd, 1st edition.
3. Brock, *Biology of Microorganisms*, Pearson/Prentice Hall, 3rd edition, ,2006.
4. L. Stryer, *Biochemistry*, 4th edition, Freeman, 2002.
5. G. Gottschalk, *Bacterial Metabolism*, Springer-Verlag, New-York, Berlin, 2nd edition, 1986.

REFERENCES:

1. Stanier *et al., General Microbiology*, Mc Millan Education, London, 5th edition, 1991.
2. Atlas R.M, *Principles of Microbiology*, 2nd edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

(10MT10302) MOLECULAR BIOLOGY

L	P	C
4	-	4

UNIT I

DNA Structure, Replication and Repair. Genes arrangement. Eukaryotic chromosome structure and replication. Repetitive DNA. CpG islands, Gene amplification.

UNIT II

Thermal melting of DNA - a) Isolation of DNA (nuclear and Mt) b) Agarose gel electrophoresis c) Detection of DNA modifications: i) Restriction endonuclease digestions, separation of fragments by gel chromatography and density gradient centrifugation ii) Base composition analysis of DNA.

UNIT III

Different classes of RNA and their functions. RNA synthesis and other post transcriptional modifications.

UNIT IV

Protein synthesis and translational control. Control of gene expression in Prokaryotes. Transcriptional control in Eukaryotes.

UNIT V

Plasmids, Transposable elements and TY elements. Molecular mechanism of antisense molecules, Inhibition of splicing, polyadenylation and translation, disruption of RNA structure and capping.

UNIT VI

Mutations: Nonsense, missense and point mutations; intragenic and intergenic suppression; Frameshift mutations; physical, chemical and biological mutagens.

UNIT VII

Biochemistry of ribozyme; hammer- head, hairpin and other ribozymes, strategies for designing ribozymes, Applications of antisense and ribozyme technologies.

UNIT VIII

Introduction, What is cloning; different types of cloning, cloning technologies, uses, Animal cloning, clones of organs and use in transplants, risks and critical issues of cloning.

TEXT BOOKS:

1. Waston *et al., Molecular Biology of the gene*, CSHL Press, 5th edition, 2004.
2. Benjamin Lewis, *Genes VI,* Oxford & IBH Publishing Co., 4th edition.
3. William H. Elliott and Daphne C. Elliott, *Biochemistry and Molecular biology*, Oxford University press, 3rd edition, 2005.

REFERENCES:

1. Ursula Goodenough, *Genetics,* Saunders (W.B.) Co Ltd, 2nd edition.
2. Garl P. Swanson, Mertz & Young, *Cytogenetics,* Tata McGraw Hill Publications, 2nd edition.
3. Luria & Darnell, *General Virology,* John Wiley & Sons Inc, 3rd edition.
4. Alberts *et al., Molecular Biology of the Cell,* New York, Garland Science, 4th edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

(10MT10303) MICROBIAL ENGINEERING

L	P	C
4	-	4

UNIT I

Brief survey of microorganisms, isolation, preservation and improvement of industrial microorganisms, steps involved in bioprocess, generalized process flow sheet for bioprocess, case studies.

UNIT II

Raw materials for fermentation processes - Carbon, nitrogen, minerals, vitamins and other nutrients. Chemical and physical treatment of industrial substrates, simple and complex media.

UNIT III

Material balance - Thermodynamic preliminaries, system and process, steady state and equilibrium, law of conservation of mass, material balances with recycle and bypass streams and numerical problems relevant to topics.

UNIT IV

Energy balance - Basic energy concepts, intensive & extensive properties, studies of enthalpy for reactive and non reactive processes. Heat of combustion, heat of reaction at non standard conditions. Thermodynamics of microbial growth, energy balance equation for cell culture, unsteady state energy balance equations and numerical problems relevant to topics.

UNIT V

Medium optimization - Medium optimization techniques with special emphasize on statistical techniques, Placket-Burman design, ANOVA, central, composite design, response surface methodology.

UNIT VI

Sterilization - Media sterilization, kinetics of thermal death of cells & spores, design of batch and continuous thermal sterilization, coupling of Arhenious equation and cell death kinetics, sterilization equipment, sterilization of air and filter design. Radiation and chemical sterilization.

UNIT VII

Stoichiometry of bioreaction and energetics of microbial growth, ATP and redox potential balance, Yield coefficients, Growth stoichiometry and elemental balances, electron balances, productivity and their correlation with the stoichiometry. Un-structured model for microbial growth. The

development of different microbial growth kinetics like Malthus, Pearl and Read, Monod Model, Konark Model. The limitation of Monod model and development of other constitutive models. Multisubstrate model, inhibition models for substrate, product and toxic substances, development of logistic equation. Maintenance and endogenous metabolism kinetics.

UNIT VIII

Kinetics based on molecular mechanism, model for plasmid structured models - a few examples, Single cell model, Product formation, expression and replication, model of gene expression, Segregated model. Models of plasmid stability. Engineering and social considerations for the production of r-DNA products; safety, good laboratory and manufacturing practices. Parameter estimation, model validation and bioprocess optimization.

TEXT BOOKS

1. James E. Bailey& David F.Ollis, *Biochemical Engineering Fundamentals,* McGraw -Hill International Editions, 2nd edition.
2. M.L. Shuler and F.Kargi, *Bioprocess Engineering-Basic Concepts,* Prentice Hall of India, 2nd edition.
3. P.M.Doran, *Bioprocess Engineering Principles,* Academic Press.
4. D G Rao, *Introduction to Biochemical Engineering,* Tata McGraw Hill, 2nd edition.
5. A.V.N.Swamy, *Biochemical Engineering,* BS Publications, 1st edition.

REFERENCES:

1. Blanch HW and Clark DS, *Biochemical Engineering,* Marcel Dekker, 1st edition, 2007.
2. Syed Tanveer Ahmed Inamdar, *Biochemical Engineering Principles and Functions,* PHI Learning Private limited.
3. Moser A, *Bioprocess Technology:kinetics and reactors,* Springer Verlag, 1st edition, 1988.
4. Schugerl K, Bellgart K H (Eds), *Bioreaction Engineering: Modeling and and Control,* Springer - Verlog, Berlin, 2000.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

(10MT10304) IMMUNOLOGY

L	P	C
4	-	4

UNIT I

Components of innate and acquired immunity - phagocytosis complement and inflammatory responses. Humoral and cell mediated immune response. Benefits of immunity, plant immunity, systemic, and acquired resistance.

UNIT II

Cells and organs of immune system - Lymphoid cells, T cells, B cells, Monocytes, Phagocytes, Mast cells and Basophils (MALT and CALT). Primary and secondary lymphoid organs.

UNIT III

Immunogen and Antigen - Immunogenicity, Antigenicity, Primary and secondary immune responses, Epitopes, Major classes of Antigens. Immunological adjuvants.

UNIT IV

Immune responses generated by B & T lymphocytes - Basic structure of Ig, classes and subclasses of Igs, Antigenic determinants. B-Cell maturation, activation and and differentiation. Generation of Antibody diversity. T-Cell maturation, activation and differentiation, T-cell receptors and Functional T cell subjects. Antigen processing and presentation. Macrophages.Antigen receptors on B and T cells.

UNIT V

Antigen and Antibody Interactions - Precipitation, agglutination and complement mediated immune reactions. RIA, western blotting, ELISA, Immunoflourescence, Flow cytometry, Mixed lymphocyte reaction, Apoptosis.

UNIT VI

MHC in immune response - Structure and function of MHC molecules, Diversity of MHC molecules. GVH reactions.

UNIT VII

Clinical Immunology - Immunity to injection, Bacterial, Viral, fungal and parasitic infections (one example from each group). Hypersensitivity: Different types of hypersensitivities.

UNIT VIII

Autoimmunity -Autoimmunity and Immuno deficiency disease, Criteria and Etiology of Autoimmune diseases, Examples of Autoimmune diseases and Immuno deficiency diseases.

TEXT BOOKS:

1. E.Roitt, *Essential Immunology,* Blackwell Scientific Publications, Oxford, London, 4th edition, 1980.
2. Richard A Goldsby, Thomas J Kindt and Barbara A Osborne, *Kuby Immunology,* WH Freeman and Company, 5th edition, 2003.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

(10MT10305) PROCESS ENGINEERING PRINCIPLES

L	P	C
4	-	4

UNIT I

Fundamentals of Process Engineering - Brief overview, Concepts of unit operation & unit process with examples, Units and dimensions, Dimensional analysis, Presentation and Analysis of data.

UNIT II

Basics of Thermodynamics - Various thermodynamic properties, Laws of thermodynamics, simple numerical problems, Phase and Chemical Equilibria.

UNIT III

Fluids mechanics - Introduction , Newton's law of viscosity, Flow curves for non-Newtonian fluids with examples from biotechnology, flow patterns - laminar and turbulent, Reynolds experiment - Reynolds number, Steady flow - Equation of continuity, pressure drop due to friction, Reynolds number and friction factor, Derivation of Bernoulli's equation for one dimensional flow, its limitation and corrections and applications in flow meters.

UNIT IV

Solid-Fluid Flow - packed beds and pressure drop through packed beds, Fluidization - concept, significance in chemical industry, pressure drop across fluidized beds. Various types of fluid moving machinery.

UNIT V

Conductive Heat transfer - Modes of heat transfer with examples, conduction, convection and radiation, definitions and governing laws, Thermal boundary layer and Prandtl number, conductivity and resistivity, compound resistances in series, heat transfer through cylindrical pipe, analogy between momentum and heat transfer, simple numerical problems on conduction.

UNIT VI

Convective Heat transfer - Convection - Natural and forced convection, dimensionless numbers in heat transfer, concept of heat transfer coefficient and overall heat transfer coefficient, radiation, combined heat transfer by conduction, convection and radiation.

UNIT VII

Mass transfer - Definition, Ficks law of diffusion , Analogy of momentum heat and mass transfer, diffusivities of gases and liquids, fundamentals of mass transfer, theories of mass transfer, concept of mass transfer coefficients, dimensionless numbers.

UNIT VIII

Mass Transfer operations - Solid-Liquid, Liquid-Liquid, Gas-Liquid Operations and their importance in bioprocessing with typical examples.

TEXT BOOKS:

1. McCabe, Simth and Harriott, *Unit operations of Chemical Engineering,* McGraw Hill publishers, 2005.
2. D G Rao, *Introduction to Biochemical Engineering,* Tata McGraw Hill Publications, 2nd edition, 2005.
3. R E Treybal, *Mass Transfer Operations,* McGraw Hill Publications, 1981.
4. J M Smith and H C Van ness, *Introduction to Chemical Engineering, Thermodynamics,* 6th edition.

REFERENCES:

1. Pauline M Doran, *Bioprocess Engineering principles,* Academic Press, 1st edition.
2. K. A. Gavhane, *Unit Operations-1,* Nirali Prakashan Publication.
3. C.J.Geankoplis, *Transport Process and Unit Operation,* Prentice Hall Hall India Ltd, 3rd edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

Elective - I

(10MT10306) ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

L P C

UNIT I

Different methods of electrophoresis for protein, Nucleic acids, Small molecular weight compounds and immuno-precipitates (Immuno-electrophoresis). Peptide mapping and combination of electrofocusing, Capillary electropheresis, Blotting techniques, PCR variants and Cytogenetics.

UNIT II

Theory of centrifugation and application to biological systems. Rotors angle/vertical/zonal/continuous flow centrifuge, differential centrifugation density gradient centrifugation. Ultracentrifugation principle and application.

UNIT III

Introduction, Principles, Instrumentation and Applications of Chromatography Techniques - Adsorption, Affinity, Partition, Ion exchange, Gel permeation, GLC, TLC and HPLC , HPTLC and FPTLC.

UNIT IV

Introduction, Principles, Instrumentation and Applications of UV-Visible Spectrophotometer, FTIR, Fluorescence, ORD, CD and PAS.

UNIT V

Principle and Applications of Nuclear Magnetic Resonance Spectroscopy, Electron Spin Resonance and Mass spectrometry - MALDI Tof.

UNIT VI

Radio-isotopic Techniques: Use of radioactive and stable isotopes and their detection in biological systems. Radioactive Decay - types and measurements, GM Counter - Principle and Applications, RIA, Autoradiography. Non-radioisotopes, fluorescent dye tracking, sequencing fragment analysizer and Microarrays.

UNIT VII

Automatic analyzer for amino acids, protein sequenater, peptide synthesizer and nucleic acid synthesizer. Cell sorters and their applications. Theory of lyophilization and its applications to biological systems.

UNIT VIII

Principles and Applications of Scanning and Transmission Electron Microscopy, Tunneling electron microscope, Confocal Microscopy, Cyto-photometry and Flow cytometry and AFM.

TEXT BOOKS:

1. Pranab Kumar Banerjee,*Introduction to Biophysics,* S Chand and company, 6th edition, 2008.
2. G. R Chatwal and S. K Anand, *Instrumental methods of chemical analysis,* Himalaya publishing house, 17th edition, 2008.
3. Skoog & West, *Principle of Instrumental Analysis,* Saunders College Publishing/Harcourt Brace, 5th edition.

REFERENCES:

1. S. Harisha, *Biotechnology Procedures and Experiments hand book,* Infinity Science Press LIC, 1st edition, 2008.
2. Upadhyay& Nath, *Biophysical Chemistry,* Himalaya, 1st edition.
3. Skoog *et al.*, *Principle of Instrumental Analysis,* Wadsworth Publishing Co., 7th edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

Elective - I

(10MT10307) ENZYME ENGINEERING AND TECHNOLOGY

L P C

UNIT I

Introduction to enzymes - Nomenclature and classification of enzymes specific activity, turnover number. Basis of enzymatic reaction, collision theory and transition state theory.

UNIT II

Hydrolytic, covalent, acid-base, electrostatic and metal ion involved catalysis. Energetics of substrate binding. The mechanism of action of chymotrypsin isoenzyme, glyceraldehyde-3-phosphate etc., Determination of the number of active sites of enzyme.

UNIT III

Temperature dependence of rate constants of enzymatic reaction, thermal deactivation, pH effect on rate constants and protein structure. Stoichiometry of bioreaction and energetics of enzymatic reaction, ATP and redox potential balance. Yield coefficients and their correlation with the stoichiometry.

UNIT IV

Enzyme kinetics - kinetics of single substrate enzyme catalyzed reactions. Michaelis-Menten equation, Brigg's-Haldane equation and estimation of constants using graphical technique.

UNIT V

Enzyme inhibition kinetics-substrate, product and toxic substance inhibition.

UNIT VI

Pre steady state kinetics, determination of rate constants, rapid mixing, stopped flow and relaxation technique. Enzyme kinetics at limiting condition, enzyme kinetics at interface and kinetics of multi substrate reactions.

UNIT VII

Purification of Enzymes - Extraction of enzymes, Enzyme assays, Purification of enzymes by using different techniques.

UNIT VIII

Immobilization of biocatalysts: an introduction, Electrostatic effect, effect of charged and uncharged support, Effect of external and internal mass transfer, Damkohler number, Effectiveness factor, Intra-particle diffusion kinetics, Biot number.

TEXT BOOKS:

1. Trevor Palmer, *Enzymes,* East - West Press Private Ltd., 1st edition, 2004.
2. Blanch HW and Clark DS, *Biochemical Engineering,* Marcel Dekker Year of Publication, 2007.

REFERENCES:

1. James E. Bailey & David F.Ollis, *Biochemical Engineering Fundamentals,* McGraw -Hill International Editions, 2nd edition.
2. Schugerl K, Bellgart KH(Eds), *Bioreaction Engineering:modeling and control,* Springer-Verlog, Berlin, 2000.
3. Wiseman, A, *Handbook of Enzyme Biotechnology,* Ellis Horwood Publication, 3rd edition.
4. Moser, A, *Bioprocess technology:Kinetics and reactors*, Springer Verlog, 1988.
5. Syed Tanveer Ahmed Inamdar, *Biochemical Engineering Principles and functions,* PHI Learning Private limited, 4th edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

Elective - I

(10MT10308) FOOD PROCESS AND BIOTECHNOLOGY

L P C

UNIT I

Basic principles of food preservation and processing. Preservation of food by removal or supply of heat, dehydration, irradiation, addition of chemicals and fermentation. CA/MA storage; Water activity and food stability.

UNIT II

Introduction to microbiology of food. Types of Microorganism associated with food-mold, yeast and bacteria. Microbial growth pattern, physical and chemical methods influencing destruction of microorganisms.

UNIT III

Microorganisms in natural food products and their control. Biochemical changes caused by microorganism, deterioration and spoilage of various types of food products, microbial food preservation.

UNIT IV

Food chemistry - definition and importance, Carbohydrates - chemical reactions, functional properties of sugars and polysaccharides in foods. Natural food flavours, extraction methods. Pigments in foods and their industrial applications.

UNIT V

Additives in food processing and preservation. Their function and safety. Safety and quality evaluation of additives. Acute and chronic studies. Food contaminants, physical, chemical, microbial and other contaminants; food toxicants.

UNIT VI

History and development of food biotechnology, Application of genetics to food production.

UNIT VII

Regulatory and social aspects of GM foods. Genetically modified foods (GMF).

UNIT VIII

Food Technology: Technological processes for industrial manufacture of selected foods of commercial importance from plants and animal sources.

TEXT BOOKS:

1. Byong H.Lee, *Fundamentals of Food Biotechnology,* Wiley VCH Inc, 1st edition, 1996.
2. B. Sivasankar, *Food Processing and preservation,* PHI Publications (Eastern economy editions), 1st edition.

REFERENCES:

1. Bender A.E, *Food Processing and Nutrition,* Academic Press, 1st edition, 1978.
2. Robinson R.K., *Dairy microbiology,* Elsevier Applied science, 2nd edition, 1983.
3. Meyer L.H.1, *Food Chemistry,* East-West Press Pvt. Ltd., 2nd edition, 1973.
4. Potter, N.N., *Food science,* AVI- Westport, 3rd edition, 1978.
5. Furia.T.E., *Handbook of food additives,* 1st edition, Volume-2, 1980.
6. Knorr D, *Food Biotechnology,* Marcel Dekker, New York, 1st edition, 1982.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

Elective - I

(10MT10309) METABOLIC REGULATION

L P C

UNIT I

Enzymes And Enzymatic Systems - Enzymes, nomenclature, Non-Conventional Enzymes, nature\Multi-enzyme system: properties, mechanism of action of Enzymes.

UNIT II

Transportation in Bio-membranes, Signal Transduction - Structure of plasma membranes. Transportation of molecules across plasma membrane. Modes of cell signaling, Types of receptors used for cell signaling, pathway of intracellular signal transduction using secondary messengers.

UNIT III

Major Biomolecules - Carbohydrates, classification of carbohydrates, Lipids, function and classification of lipids. Protein structure and function, Nucleic acids, structure & function.

UNIT IV

Metabolism Of Carbohydrates And Proteins - Glycolysis, Glucogenesis, Citric acid cycle and Glycogen metabolism. Protein turnover and Amino acid catabolism, Biosynthesis of amino acids.

UNIT V

Lipid Metabolism, Nucleic Acids & Metabolism - Overview of Fatty Acid Metabolism, synthesis and degradation of fatty acids, De novo and salvage pathways of nucleotide synthesis.

UNIT VI

Biosythetic Pathways Of Secondary Metabolities - Overview of secondary metabolism relationship between Tropophase and Idiophase. Production of alkaloids, flavanoids, Terpenoids and polyketides. Regulation of secondary metabolites, Applications of secondary metabolites.

UNIT VII

Metabolic Control - General mechanisms of enzyme regulation: feed back control, induction, allosteric enzymes, modes of regulation of metabolic processes.

UNIT VIII

Enzymes Kinetics - Enzymes turnover and methods employed to measure turnover of enzymes, significance of enzymes turnover.

TEXT BOOKS:

1. Jeremy M.Berg, John L.Tymozko, Lubert Stryer, Biochemistry, W.H. Freeman and Company, 5th edition.
2. William H. Elliott and Daphne C. Elliott, *Biochemistry and Molecular Biology,* Oxford University press, 3rd edition.
3. L.Stryer, *Biochemistry,* CBS publication, 3rd edition.

REFERENCES:

1. Nicholas C. Price and Lewis Stevens, *Fundamentals of Enzymology,* Oxford University Press, 3rd edition, 1989.
2. M. Dixon, E.C. Webb, CJR Thorne and K. F. Tipton, *Enzymes*, Longman, 3rd edition, 1979.
3. Albert L. Lehninger, David L. Nelson, Michael L. Cox, *Principles of Biochemistry,* W H Freeman & Company, 4th edition.
4. Richard I. Gumport, Jeremy M. Berg, Nancy Counts Gerber, Frank H. Deis, Jeremy Berg, *Student Companion to Accompany Biochemistry,* W H Freeman & Co, 5th edition.
5. White, Handler and R.B.Smith, *Biochemistry,*Tata McGraw Hill Publications, 7th edition, 1983.
6. Jain J.L.,Sanjay Jain & Nitin Jain, *Fundamentals of Biochemistry,* S.Chand and Company Ltd, 1st edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, I Semester

Elective - I

(10MT10310) PROCESS ENGINEERING PRINCIPLES/ MICROBIOLOGY & BIOCHEMISTRY LAB

L	P	C
-	3	2

1. PROCESS ENGINEERING PRINCIPLES

LIST OF EXPERIMENTS:

a. Evaluation of friction factor through pipes and packed columns.
b. Heat transfer in forced and natural conduction.
c. Distillation of multi-component mixture.
d. Estimation of Diffusivity of volatile liquids.
e. Solvent extraction (Solid-Liquid and Liquid-Liquid).

2. MICROBIOLOGY & BIOCHEMISTRY LAB

LIST OF EXPERIMENTS:

a. Basic techniques in handling microbes- sterilization, media preparation, precautions etc.,
b. Study of growth rate and the factors affecting it.
c. Chromatography - including Paper, TLC, GLC, Gel filtration chromatography (HPLC) and Ion exchange chromatography.
d. Electrophoresis and Blotting Techniques - PAGE and SDS- PAGE. Determination of molecular weight. Western Blot technique.
e. Quantitative determination of carbohydrate content: e.g. Preparation of Starch from various sources, starch hydrolysis and determination of carbohydrate content.
f. Estimation of proteins by Lowry's and Biuret methods e.g. in milk, legumes and pulses.
g. Isolation and Estimation of DNA by Diphenylamine reaction and UV - spectroscopic methods.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

(10MT20301) BIOREACTOR ENGINEERING

L	P	C
4	-	4

UNIT I

Introduction - Bioreactor function, utility, types of bioreactors. Modes of bioreactor operations, Main components of the bioreactor and their function.

Methods of Aeration, Surface aeration, Shake flask, Mechanical stirred bioreactors, Enzyme catalysis in CSTR. Cell death in batch reactor, endogenous metabolism, maintenance, product and substrate inhibition in chemostat.

UNIT II

Bioreactors and design features - Batch reactor, chemostat CSTR, Plug Flow Reactor, Fed batch reactor, Bubble column, bubble generation at an orifice, bubble coalescence and breakup, gas holdup, interfacial area, immobile and mobile gas liquid interface, regimes of bubbles, design of bubble columns, Cascade reactor, air left reactor, Fluidized bed bioreactors, trickle bed reactors, Immobilized bioreactors, recycle bioreactors.

UNIT III

Gas-liquid mass transfer in cellular systems, basic mass transfer concepts, solubility of gases (O_2, CO_2) in biological media, mass balances for two - phase bioreactor.

Mass transfer -introduction to mass transfer between phases, mass transfer in porous solids, quantifying mass transfer, mass transfer & experimental design.

Oxygen transfer - Introduction, oxygen transfer process, factor effecting k_La, interfacial area and oxygen transfer, factors effecting the saturation concentration of oxygen, oxygen uptake.

UNIT IV

Mixing - Mechanism and necessity of mixing, Various types of mixing equipment. Power requirement for mixing in aerated and non aerated tanks, agitated and non-agitated tanks for Newtonian and non Newtonian fluid. Mixing time in agitated reactor, residence time distribution, non-ideal reactor and multiphase bioreactor.

UNIT V

Mass transfer in agitated tanks, correlations for k_La in Newtonian and Non-Newtonian liquid, Power number. Experimental determination of k_La, static method, dynamic method, chemical method and electrochemical method.

UNIT VI

Aeration and Agitation in Animal Cell Bioreactors - Introduction, cell damage in animal cell bioreactors, shear damage, bubble damage ,Methods of minimizing cell damage. Laminar & Turbulent flow in stirred tank bioreactors, turbulent eddies, kolmogrov eddy size, Preventing vortex formation, Off centre impellers, Baffles.

UNIT VII

Control of Bioreactor - strategy, online and offline monitoring of bioreactors; computerized bioprocess control. Direct regulatory control and cascade control mechanism.

UNIT VIII

Scale up and scale down of mass transfer equipment in bioprocess, sensors used in the bioreactor, pH, O2, CO2 electrode. Online sensors for cell properties.

TEXT BOOKS:

1. Bailey JE, *Biochemical Engineering Fundamentals,* Ollis Year of Publication, 2nd edition, 1986.
2. Blanch HW and Clark DS, *Biochemical Engineering,* Marcel Dekker Year of Publication, 2nd edition, 1987.
3. D G Rao, *Introduction to Biochemical Engineering,* Tata McGraw Hill, New Delhi, 2nd edition 2009.
4. P M Doran, *Bioprocess Engineering Principles*, Academic Press, 1st edition,1995.

REFERENCES:

1. Wiseman, A, *Handbook of Enzyme Biotechnology,*Ellis Horwood Publication, 3rd edition, 1999.
2. Moser, A, *Bioprocess technology:Kinetics and reactors*, Springer Verlag, Year of Publication, 1st edition, 1988.
3. Schugerl K, Bellgart KH (Eds)*, Bioreaction Engineering : Mod eling and control*, Springer verlog, Berlin Year of Publication, 4th edition, 2000.
4. Syed Tanveer Ahmed Inamdar, *Biochemical Engineering Principles and Functions,* PHI Learning Private limited, 2nd edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

(10MT20302) GENETIC ENGINEERING

L	P	C
4	-	4

UNIT I

Scope of Genetic Engineering, Milestones in Genetic Engineering, Genetic engineering guidelines.

UNIT II

Molecular Tools in genetic engineering: Restriction enzymes, ligases, s1 nuclease, terminal deoxynucleotides, transferases, polymerases, Reverse Transcriptase and Alkaline phosphatase. Modification enzymes and Molecular markers.

UNIT III

Nucleic Acid Purification and Amplification and its Applications. Restriction Mapping of DNA Fragments and Map Construction.

UNIT IV

Gene Cloning Vectors- Plasmids, bacteriophages, phagemids, cosmids, Artificial chromosomes.

UNIT V

cDNA Synthesis and cDNA library preparations. Cloning mRNA enrichment, reverse transcription, DNA primers, Linkers, adaptors and their chemical synthesis, Library construction and screening. Genomic libraries (complete sequencing projects).

Alternative Strategies of Gene Cloning Cloning interacting genes- Two- and three hybrid systems, cloning differentially expressed genes. Site-directed Mutagenesis and Protein Engineering

UNIT VI

Study of Gene Regulation. DNA transfection, Northern blot, Primer extension, S1 mapping, RNase protection assay, Reporter assays. Nucleic acid microarrays.

UNIT VII

Expression Strategies for Heterologous Genes Vector engineering and codon optimization, host engineering, In-vitro transcription and translation, expression in bacteria, expression in Yeast, expression in insects and insect cells, expression in mammalian cells, expression in plants. Processing of Recombinant Proteins Purification and refolding, characterization of recombinant proteins, stabilization of proteins.

UNIT VIII

Phage Display - T-DNA and Transposon Tagging Role of gene tagging in gene analysis, T-DNA and transposon tagging, Identification and isolation of genes through T-DNA or transposon. Transgenic and Gene Knockout Technologies Targeted gene replacement, Chromosome engineering. Gene Therapy Vector engineering. Strategies of gene delivery, gene replacement/augmentation, gene correction, gene editing, gene regulation and silencing.

TEXT BOOKS:

1. S.B.Primrose and R.M.Twyman, *Principles of Gene Manipulation and Genomics,* Blackwell Publishers, Oxford, 7th edition, 2006.
2. T.A.Brown, *Gene Cloning and DNA Analysis,* Blackwell Publishers, Oxford, 4th edition, 2001.
3. Stanly.R.Maloy, John E.Cronan, Jr. David Freifelder, *Microbial Genetics,* Narosa Publishing House, 2nd edition, 2006.

REFERENCES:

1. P.B.Kaufman,W. Wu. D. Kim and L.J. Cseke*, Molecular and Cellular Methods in Biology and Medicine,*CRC Press, Florida, 6th edition, 2006.
2. D.V. Goeddel , *Methods in Enzymology -, Gene Expression Technology,* Academic Press, Inc., San Diego, 1990.
3. D.A.Mickloss and G.A. Froyer. *DNA Science. A First Course in Re-combinant Technology,* Cold Spring Harbor Laboratory Press, New YorK, 1st edition, 1990.
4. S.B. Primrose, *Molecular Biotechnology,* Blackwell Scientific Publishers, Oxford, 2nd Edition, 1994.
5. J.A. Davies and W.S. Reznikoff, *Milestones in Biotechnology*- Classic papers on Genetic Engineering, Butterworth-Heinemann, Boston, 2nd edition,1992.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

(10MT20303) BIOSEPARATION PROCESSES

L	P	C
4	-	4

UNIT I

Introduction - Upstream and downstream processing of bioprocess, characteristics of biological mixtures, characteristics of products, bioprocess economics. Criteria for selection of bioseparation techniques.

UNIT II

Cell Disruption - Different methods of cell disruption, advantages and disadvantages, scale up of bead mill and homogenizer, solid shear and liquid shear method, numerical problems relevant to topics.

UNIT III

Solid -Liquid separation - Pretreatment of fermentation broth, Filtration: Principle, constant pressure constant volume filtration, plate and frame filter press, Rotary drum vacuum filter.

Centrifugation: Principle, RCF, tubular bowl centrifuge, disc stack centrifuge, basket centrifuge scale up of centrifuges. Ultra centrifuges: Principle and applications numerical problems related to centrifugation and filtration and Flocculation.

UNIT IV

Evaporation - Theory of evaporation, BPR, single effect and multiple effect evaporation, steam economy, efficiency of evaporators and various evaporation equipment.

UNIT V

Membrane separation processes: Basic principles of membrane separation, membrane characteristics, different types of membranes, criteria for selection of membranes and pervaporation.

UNIT VI

Product enrichment techniques: Liquid-liquid extraction - Extraction process and principles, phase equalitarian and distribution, batch and continuous extraction, co-current and countercurrent extraction processes, L-L-E equipment. Aqueous two phase extraction -applications in biotechnology and case studies. Supercritical fluid extraction. Precipitation: Salt and solvent precipitation.

UNIT VII

Chromatographic separation and electrophoresis methods - Principles of chromatographic separation methods, different types of chromatographic methods viz., Adsorption Chromatography, Ion - Exchange Chromatography, Gel Chromatography, Affinity Chromatography. Applications in bio-processing. Principles of electrophoresis and electrophoresis mobility, Philpot electrophoresis units and Applications.

UNIT VIII

Product polishing techniques - Crystallization: Principles of crystallization, crystallization equipment. Applications in bio-processing. Drying: Various types of drying methods, principles of drying, EMC-RH data, drying curves, various types of industrial dryers and their criteria for choice. Freeze drying technique and its advantages over other methods. Applications in bioprocessing.

TEXT BOOKS:

1. Siva Shankar, *Bioseparations (Principles and Techniques),* Prentice Hall of India Private Limited, 1st edition.
2. Peter F Stan bury, Allan Whitaker and Stephen J Hall, *Principles of Fermentation Technology,* Adithya Books (P) Ltd., New Delhi, 1st edition, 1997.

REFERENCES:

1. Juan A. Asenjo, *Separation Process in Biotechnology,* Taylor & Francis Group, Volume-2, 1st edition.
2. M.Moo Young, *Comprehensive Biotechnology,* 2nd edition, 1985.
3. Biotol series, *Product Recovery in Bioprocess technology,* Butterworth - Heinemann Ltd., 1st edition, 2004.
4. W.L. McCabe, J.C.Smith, P. Harriot, *Unit Operations of Chemical Engineering,* McGraw - Hill International, 7th edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

(10MT20304) CELL TECHNOLOGY

L	P	C
4	-	4

UNIT I
Introduction and advantages of animal and plant tissue culture - types of tissue cultures.

UNIT II
Equipments - culture vessels - minimal requirements of cell cultures - sterilization techniques.

UNIT III
Physico-chemical properties of media - balanced salt solution - media constituents - selection of medium & serum - other supplements - serum free media - disadvantages of serum - advantages of serum free media - protein free media. Plant tissue culture media.

UNIT IV
Generation of cell lines, Immortalization & transformation, Use of cellular/Viral oncogenes and oncoviruses.

UNIT V
Characterization of cultured cells - measurement of growth parameters of cultured cells - cell synchronization - senescence - apoptosis - types of primary cell culture - isolation of tissue - primary culture - cell lines - subculture - stem cell cultures.

UNIT VI
Cell quantification - equipment - types of culture process - scale-up in suspension - scale-up in monolayer - cell growth in scale-up - cell viability and cytotoxicity.

UNIT VII
Engineered cells, Somatic cell genetics, RNA silencing in cells, Complementary cells and their use.

UNIT VIII
Transformation of cells-cell cloning-suspension cloning-isolation of clones.

TEXT BOOKS:

1. Freshney. *Culture of Animal Cells,* Wiley-Liss, 3rd edition.
2. Ed. John R.W. Masters, *Animal Cell Culture - Practical Approach,* Oxford, 3rd edition.

REFERENCES:

1. Ed. Martin Clynes, *Animal Cell Culture Techniques,* Springer, 3rd edition.
2. Ed. Jenni P Mather and David Barnes, *Methods in Cell Biology, Animal Cell Culture Methods,* Academic press, Vol. 57.
3. Ed. R. Basega, *Cell Growth and Division: A Practical Approach*, IRL Press, 6th edition.
4. Fax. Eds. M Butler & M. Dawson, *Cell Culture Lab,* Bios Scientific Publications Ltd..Oxford, 6th edition.
5. R. Ian Freshney, *Culture of Animal Cell,*Wiley-Liss, 5th edition.
6. U. Satyanarayana, *Biotechnology,* Books and Allied (P) Ltd, 6th edition, 2007.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

(10MT20305) BIOINFORMATICS

L	P	C
4	-	4

UNIT I

Introduction to Bioinformatics and Biological Databases - Introduction to Bioinformatics- History, overview, Applications Emerging areas of Genomics and Proteomics Biological databases and their management - Protein Sequence databases, Protein structure databases, DNA databases, drug databases.

UNIT II

Nucleotide Sequence Analysis - Nucleotide sequence analysis DNA Sequence Analysis- Nucleic acid codes, Introduction to whole genome analysis, restriction site checks, Sequence assembly, finding overlaps and contigs, shotgun projects, walking primers, ORF analysis, Identification of transcription signals and other sequence patterns, Restriction enzyme databases, Coding region identification, EST analysis, SNP analysis.

UNIT III

RNA Structures - RNA Sequence and structure Analysis - Different types of RNA, si-RNA design and development, micro RNA identification strategies, RNA secondary structure, RNA structure Prediction Methods, Introduction to Small nuclear RNAs, Applications of Small nuclear RNA DNA/Protein Sequence alignments

UNIT IV

Statistical Methods In Bioinformatics - Dynamic programming methods-derivation and algorithms Sequence Alignment concepts, Pair-wise alignment, Heuristic alignments, Multiple alignment, Matrices (PAM, BLOSUM) Statistics and Scoring systems.

UNIT V

Protein sequence analysis - Protein Physical properties- Molecular weight and amino acid composition, Iso-electric point, extinction coefft, Studies of protein hydrophobicity on kyte and Doolittle scale and other physico-chemical properties of primary protein sequences.

Structural properties- Secondary structures, Hydrophobic patterns, structural motifs, Post translational modifications, Folding domain motifs, protein families.

Principles of Protein Structure - Secondary Structure prediction methodologies, Threading methods Protein Folds, protein domains, Tertiary structure prediction.

UNIT VI

Modeling Of Proteins - Homology Modeling of proteins- methodology and applications Ab initio-protein structure prediction, Energy minimization - concept, applications and methodology, Molecular Dynamics simulations - concept and methodology.

UNIT VII

Analysis of the Genome sequencing data: Processing and assembly of whole genome sequence data, base - calling (PHRED); Vector and E.Coli masking; Assemble using PHRAP, CAP3; Assessment of final data quality; types of misassemblies and their solution.

UNIT VIII

Bioinformatics Applications and Drug Modeling - QSAR and Drug Designing Concepts:2D descriptors and 3D descriptors.

Drug Discovery: Drug Discovery Overview, Stages of drug discovery and Introduction to drug discovery tools- MoE and Accelyrs suite.

Bioinformatics applications in experimental biotechnology: Automatic 2D Gel analysis- Tools, Principles and methodology, Restriction analysis of DNA sequences, Insilico Primer Design, Micro-array image and data analysis, Protein Interaction Mapping (Yeast 2 Hybrids), Functional genomics tools and Functional proteomics tools.

TEXT BOOKS:

1. Zoe Lacroix and Terence Critchlow, *Bioinformatics,* Morgan Kaufmann Publishers, 1st edition, 2003.
2. Orpita Bosu and Simminder Kaur Thukral, *Bioinformatics,* Oxford University press, 1st edition, 2007.

REFERENCES:

1. David W Mount, *Bioinformatics: Genome and sequence analysis,* CBS Publications, 2nd edition.
2. Baxevanis, Andreas D, *Bioinformatics: A practical guide to analysis of genes and proteins,* Wiley-Interscience publishers, 3rd edition.
3. Peter Clote and Rolf Backofen, *Computational Molecular Biology- An Introduction,* John Wiley & Sons, 4th edition.
4. Igor F.Tsigelny, *Protein Structure Prediction: Bioinformatics approach,* International University Line, 1st edition.
5. Dov stekel, *Microarray Bioinformatics,* Cambridge University press, 1st edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

(10MT20306) ADVANCED IMMUNOTECHNOLOGY

L	P	C
4	-	4

UNIT 1

Vaccinology - Active and passive immunization. Live, Killed, attenuated and subunit vaccines. Idiotypic vaccines. Role and properties of adjuvants. R-DNA and protein based vaccines, plant based vaccines. Peptide vaccines, Conjugate vaccines. Recombinant antibodies.

UNIT II

Lymphocyte subsets, activation and regulation - Recall antigen presentation and cross presentation, Th1, Th2, Th17 Treg subsets and their functions. Cytokines and Lymphokines in T- Cell activation and function.

UNIT III

Immunological memory - T-cells memory, B-cells memory, central and peripheral memory, Relationship between memory and vaccines and infection.

UNIT IV

Adjuvants - Function of adjuvants, mechanism of action, new generation adjuvants, plant based adjuvants.

UNIT V

Immunotherapy - Polyclonal and monoclonal antibodies, cytokines, Interleukins, cytoimmunotherapy, immunomodulators in therapy. Immunotherapy of HIV infection.

UNIT VI

Tumor Immunology -Tumor antigens, categories of Tumor antigens and Immunodiagnosis

UNIT VII

Immunobiotechnology - Hybridoma, viral, bacterial peptides, Genetically engineered production of lymphokines, Second generation antibodies.

UNIT VIII

Immnological techniques- Immunodiffusion, immunoblot, immunofloures-cence, ELISA, Immunoprecipitation, Immunoelectrophoresis, Biotinylation, Avidin-streptavidin cross linking, Immunomodulations.

TEXT BOOKS:

1. Ivan M.Roitt, *Essential Immunology,* Blackwell Scientific Publications, Oxford, London, 4th edition, 1980.
2. Fahim Halim Khan, *The Elements of Immunology,* Pearson Educations, 1st edition, 2009.

REFERENCES:

1. John Playfair and Gregory Bancroft, *Infection and immunity,* Oxford University press, 3rd edition, 2008.
2. J.W. Goding, *Monoclonal antibodies: Principles and practice,* Academic Press, 2nd edition.
3. T.A. Sringer ed., *Hybridoma Technology in the Biosciences and Medicine,* Plenum Press, New York, 3rd edition.
4. VR. Muthukkaruppan, S. Baskar and F. Sinigagalia, *Hybridoma Techniques: A Laboratory Course,* Macmillan India Ltd, 4th edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

Elective - II

(10MT20307) PLANT BIOTECHNOLOGY

L P C

UNIT I
Different areas and applications of plant tissue culture. Totipotency of plant cells & its realization invitro.

UNIT II
Establishment of aseptic cultures, Initiation of callus and suspension cultures, Regeneration of plants, Organogenesis, Micro propagation with shoot apex cultures (Clonal, Propagation), Somatic Embryogenesis.

UNIT III
Isolation and culture of protoplasts, protoplast fusion and somatic hybridization, Selection systems for somatic hybrids / Cybrids and their characterization.

UNIT IV
Anther & Pollen culture, Production of haploids, Significance and their application. Marker assisted selection and molecular breeding.

UNIT V
Induction of mutation, Somoclonal variation. Storage of plant genetic resources (Cryopreservation).

UNIT VI
Production of Secondary metabolites by plant cell cultures, commercial production of secondary metabolites. Technology for yield enhancement and bioreactor system and models for mass cultivation of plant cells. Bio-transformations using plant cell cultures.

UNIT VII
Genetic Transformation methods for production of transgenic plants (Direct, Indirect) Production of genetically modified (GM) plants for Agronomic traits.

UNIT VIII

Application of Plant Biotechnology for the production of quality oil, Industrial enzymes, therapeutic proteins (plantibodies, plantigens, edible vaccines etc.,).

TEXT BOOKS:

1. J Reinert and Y P S Bajaj, *Plant Cell, Tissue and Organ culture,* Springer Verlag, 2nd edition.
2. Bhojwani SS and Razdan, *Plant Tissue Culture Theory and Applications,* Elsevier Publication, 1st edition.

REFERENCES:

1. Hammond J, McGarvey P, Yusibov V, *Plant Biotechnology New Products and Applications,* V.Springer, International 2nd edition.
2. Thorpe, T.A. (Ed.), *Plant Tissue Culture,* 2nd edition.
3. Eds. Mantell & Smith, *Plant Biotechnology,* volume-1, 1st edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

Elective - II

(10MT20308) ENVIRONMENTAL BIOTECHNOLOGY

L P C

UNIT I

Basics - Basic Concepts of Environment and Ecology and Environmental Pollution and Control - Ecosystem structure and functions: biotic and abiotic environmental factors - micro and macro nutrients, producers, consumers and decomposers - energy flow and material cycling. Major ecosystems: terrestrial and aquatic ecosystems, Sustainable development.

UNIT II

Environmental Pollution - Environmental pollution Air, water, soil pollution - their sources, effects and control through Biotechnology. Solid waste management. Global environmental problems - climate change, green-house effect and global warming, acid rains and ozone depletion - their impact and biotechnological approaches for management.

UNIT III

Waste Water Treatment Technologies - Waste water definition and types, major contaminants in waste water. Waste water treatment methods: physical, chemical, biological methods. Aerobic Processes and Anaerobic processes. Bioreactors: principles and their applications for waste water treatment.

UNIT IV

Hazardous Waste Management - Hazardous wastes - definition, classification, sources and characterization. Physical and biological routes of transport of hazardous substances. Storage and disposal facilities - landfills, underground disposal and sea disposal. Xenobiotic and recalcitrant compounds and their biodegradation. Microbial transformations of hazardous chemicals. Hazardous waste treatment and remediation technologies - waste recovery processes: solidification, stabilization, and encapsulation - biological processes - thermal processes.

UNIT V

Bioremediation - Bioremediation definition and types of bioremediation, constraints and priorities of Bioremediation, factors affecting the use of bioremediation and applications of bioremediation. Microbial systems for bioremediation. In situ and Ex situ bioremediation techniques. Liquid, solid

and slurry phase bioremediation. Bioremediation methods: physical, chemical, biological, solidification and thermal methods.

UNIT VI

industrial pollution and biotechnological approaches - Process and Production technology - characteristics of effluents and treatment schemes for waste waters of Dairy, Distillery, Tannery, Sugar, Paper and Pulp, Pesticide and Antibiotic industries, Development of biodegradable and eco-friendly products -biopolymers, bioplastics, biofuels, biodiesel, biofertilisers and Biopesticides.

UNIT VII

Metal Biotechnology - Mining and Metal biotechnology with special emphasis on Copper &Iron microbial transformation, accumulation and concentration of metals, metal leaching, extraction and future prospects.

UNIT VIII

Environmental Management - Concepts of Environmental Impact Assessment. Prediction and assessment of impact of air, water, biological, socio-economic environment. Methodology for environmental management and Environmental management plan. Concepts of environmental audit. Integrated pest management, Vermi-technology, Phytoremediation.

TEXT BOOKS:

1. Alan Scragg, *Environmental Biotechnology,* Oxford University press, 2nd edition, 2005.
2. Dilip Kumar Markandey and Neelima Rajvaidya, *Environmental Biotechnology,* A P H Publishing corporation, 1st edition.

REFERENCES:

1. SK Sgarval, *Enivironmental Biotechnology,* Gulf Publications, 1st edition.
2. H.V.Jadhav and S.H. Purohit, *Global Pollution and Environmental Monitoring,* Himalaya Publishing House, 1st edition, 2008.
3. M.Anji Reddy, *Text Book of Environmental Science and Technology,* B.S. Publications, 1st edition.
4. Erach Bharucha, *Textbook of Environmental Studies for Under -graduate Courses,* Universities Press, India, 1st edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

Elective - II

(10MT20309) NANO-BIOTECHNOLOGY

L P C

UNIT I
Introduction to Nano-biotechnology, Cellular nanostructures, Biological building blocks - sizes of building blocks and Nanostructures.

UNIT II
Polypeptide, Nano-wire and protein Nano-particle. Nucleic acids - DNA.

UNIT III
Double Nano wire, Genetic code and protein synthesis. Biological Nanostructures: Biosensors, Examples of proteins, Micelles and vesicles.

UNIT IV
Nanoparticles for drug delivery (including solid lipid nanoparticles, synthetic and biopolymeric nanoparticles), carbon nanotubes, polymeric nanofibers.

UNIT V
Multilayer films, Applications to NEMS, Bio and other applications to Nano devices.

UNIT VI
Implication in neuroscience, tissue engineering and cancer therapy.

UNIT VII
Nanotechnology for environmental and safety aspects of Nano-biotechnology.

UNIT VIII
Colloids and colloid Assemblies for Nano-biotechnology, Nano-engineered biosensors, Fiber Optic Nanosensors in medical care.

TEXT BOOKS:

1. Good Sell - Wiley Liss, *Bio Nano Technology,* Oxford Science Publications , 1st edition.
2. David S.Goodsell, *Bionanotechnology,* Wiely-Liss, 1st edition, 2004.

REFERENCES:

1. Edson, *Hand book of Nano structured materials,* Academic Press, 1st edition, volume-1.
2. M.Balakrishna rao and K.Krishna Reddy,*Encyclopaedia of Nano-Technology,* 1st edition.
3. Mark Ranter, Daniel Ranter, *Nano Technology: A gentle introduc tion to the next big idea*, Pearson education, 1st edition.
4. Charles. P.Poole Jr and Frank J. Owens, *Introduction to Nano-Technology ,*Wiley India Pvt Ltd, 2nd edition.
5. Karl Goser, *Nanoelectronics and Nanosystems*, Springer Engineering series, 1st edition.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

I M.Tech, II Semester

Elective - II

(10MT20310) BIOPROCESS ENGINEERING/
GENETIC ENGINEERING LAB

L	P	C
-	3	2

LIST OF EXPERIMENTS:

1. Immobilization of whole cells (Yeast) and enzymes (Amylase)
2. Various bioprocesses followed by product recovery e.g.
   (i) Citric acid production from *A. niger*
   (ii) Ethanol production from S. cereviceae
3. Agarose gel electrophoresis and visualization of DNA on gels.
4. Restriction enzyme digestion.
5. Isolation of plasmid DNA.
6. In vitro DNA ligation.
7. Isolation of Cytoplasmic RNA.
8. Electrophoresis of RNA on denaturing gels.
9. Transformation.
   a. Screening.
   b. Enzyme kinetic studies: Determination of Michaelis Menten constant.
   c. Microbial kinetic studies: determination of Monods-model constants.
   d. Determination of volumetric mass transfer coefficient by sodium sulphate oxidation method.
   e. Calculations for power number correlations.
   f. Media preparation for fermentation.
   g. Fermenter preparation.
   h. Fermenter testing.
   i. pH probe calibration.
   j. D.O.probe calibration.
   k. Pump calibration.
   l. Fermentor sterilization
   m. Fermentor charging.
   n. Media sterilization.
   o. Inoculation methods for fermentor.
   p. Fermentation - Batch, Fed Batch.
   q. Addition bottles: solution preparation.
   r. Sampling.
   s. Harvesting the culture from the fermentor.

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

Salient Features of Prohibition of Ragging in Educational Institutional Act 26 of 1997

- Ragging within or outside the college is prohibited.
- Ragging means doing an act which causes or is likely to cause insult or annoyance or fear or apprehension or threat or intimidation or outrage of modesty or injury to a student

Nature of Ragging	Punishment
Teasing, Embarrassing and humiliating	Imprisonment up to 6 months or fine up to Rs. 1,000/- or Both
Assaulting or using criminal force or criminal intimidation	Imprisonment up to 1 year or fine up to Rs. 2,000/- or Both
Wrongfully restraining or confining or causing hurt	Imprisonment up to 2 years or fine up to Rs. 5,000/- or Both
Causing grievous hurt, Kidnapping or rape or committing unnatural offence	Imprisonment up to 5 years or fine up to Rs. 10,000/-
Causing death or abetting suicide	Imprisonment up to 10 years or fine up to Rs. 50,000/-

Note:

1. A student convicted of any of the above offences, will be expelled from the College.
2. A student imprisoned for more than six months for any of the above offences will not be admitted in any other College.
3. A student against whom there is prima facie evidence of ragging in any form will be suspended from the College immediately.
4. The full text of Act 26 of 1997 and UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009 **(Dated 17th June, 2009) are placed in the College library for reference**.

ACADEMIC REGULATIONS

COURSE STRUCTURE

AND

DETAILED SYLLABI

For

MASTER OF COMPUTER APPLICATIONS

REGULAR THREE YEAR DEGREE PROGRAMME

(for the batches admitted from 2010-2011)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

(Affiliated to JNTUAnantapur, Approved by AICTE)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

VISION

To be one of the Nation's premier Engineering Colleges by achieving the highest order of excellence in Teaching and Research.

MISSION

- To foster intellectual curiosity, pursuit and dissemination of knowledge.
- To explore students' potential through academic freedom and integrity.
- To promote technical mastery and nurture skilled professionals to face competition in ever increasing complex world.

QUALITY POLICY

Sree Vidyanikethan Engineering College strives to establish a system of Quality Assurance to continuously address, monitor and evaluate the quality of education offered to students, thus promoting effective teaching processes for the benefit of students and making the College a Centre of Excellence for Engineering and Technological studies.

The Challenge of Change

"Mastery of change is in fact the challenge of moving human attention from an old state to a new state. Leaders can shift attention at the right time and to the right place. The real crisis of our times is the crisis of attention. Those who lead are the ones who can hold your attention and move it in a purposeful way. Transformation is nothing but a shift in attention from one form to another. The form of a beautiful butterfly breaks free from a crawling caterpillar. If you pay enough attention, you would be able to see how the butterfly hides within the caterpillar. The leader points out a butterfly when the follower sees only a caterpillar".

- Debashis Chatterjee

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(Autonomous)
(Affiliated to J.N.T. University Anantapur)

ACADEMIC REGULATIONS

Academic Regulations for the award of Full Time MCA Degree
(With effect from the academic year 2010-11)

For pursuing three year postgraduate Degree programme of study in Master of Computer Applications (MCA) offered by Sree Vidyanikethan Engineering College under Autonomous Status and herein after referred to as SVEC (Autonomous):

1	Applicability	:	All the rules specified herein after and approved by the Academic council shall be in force and applicable to the students admitted from the academic year 2010-2011 onwards. Any reference to "College" in these rules and regulations stands for Sree Vidyanikethan Engineering College (Autonomous).
2	Extent	:	All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, The Principal, Sree Vidyanikethan Engineering College shall be the Chairman, Academic Council.
3	Academic System		
3.1	Academic Year	:	The College shall follow semester pattern for the three year MCA Degree programme for conducting all its curricula. An academic year shall consist of two semesters with semester break after first, third and fifth semesters and summer break after second and fourth semesters.
3.1.1	Duration	:	**The semester shall have the duration to accommodate a minimum of 17 weeks instruction.**
3.1.2.	Academic Calendar	:	**The College shall prepare academic calendar for each academic year in advance and notify the calendar duly approved by the Academic Council.**
3.2	Credits and Grading	**:**	**In MCA programme of study, Credit system will be followed for design of curriculum and grading system will be followed in evaluation. Examination results are announced using Cumulative Grade Point Average (CGPA) on a ten point scale as described under Sec.6.5.**
3.3	Examination System	**:**	All components of this programme of study will be evaluated continuously through internal evaluation and an external evaluation conducted

as Semester-End examination and as stipulated under sections 6.1 through 6.3.

4 Admission Modalities

4.1. Admission into first year of Three Year MCA Degree programme of study:

4.1.1. Admissions **:** Admissions are made into the first year of three year MCA Degree programme as per the stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

(a) By the Convener, ICET, (for Category-A Seats).

(b) By the Management (for Category-B Seats).

4.1.2. Eligibility

Admission to the MCA Degree programme shall be made subject to the eligibility, qualifications prescribed by the competent authority from time to time.

Admissions shall be made on the basis of rank obtained by the qualifying candidates at the Entrance Test, subject to reservations or policies framed by the Government of Andhra Pradesh from time to time.

4.1.3. Admission Procedure **:** (1) For all the seats under category 4.1.1 (a), Convener, ICET shall allot admission through counseling.

(2) For the seats under category 4.1.1 (b), seats will be filled as per the stipulations laid down by the Govt. of Andhra Pradesh.

5. Credit System:

5.1 Contact Hours **:** Depending on the complexity and volume of the course the number of contact hours per week will be determined.

5.1.1. Credits **:** i) As a norm, for the theory subjects, one credit for one contact period per week is assigned.

ii) As a norm, for practical courses two credits will be assigned for three contact periods per week.

iii) Tutorials do not carry any credits. However, each of the analytical and problem oriented courses will have one tutorial period per week.

iv) Audit courses **do not** carry any credits.

For courses like Project where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

Norms for assigning credits are shown in Table 1.

Table-1

Subject	Period(s)/Week	Credit(s)
Theory	01	01
Practical	02	01
Practical	03	02
Mini project	03	02
Project	—	12

5.2 Transitory Regulations

a) Curriculum of programme of study pursued earlier, by such candidate(s) is taken up on case by case basis and examined for equivalences to the relevant programme of study prescribed by SVEC (Autonomous) for the award of MCA Degree.

b) Based on the detailed syllabus, equivalent course(s) are identified and concerned Board of Studies will certify such equivalence.

c) Credits are transferred for all such equivalent courses and treated as **"successfully cleared"** in the programme of study prescribed by SVEC (Autonomous).

5.2.1. All other modalities and regulations governing shall be the same as applicable to the batch of students into which a candidate is readmitted.

5.3. Curriculum for MCA

The three year curriculum for MCA programme formulated based on clause 5 shall have a total of **130 credits**.

5.4. Maximum duration of the Programme:

5.4.1. The maximum duration permitted for any student to successfully complete three year MCA Programme of study shall be:

Six consecutive academic years from the year of admission for a student admitted into the first year of programme.

5.4.2. In case, any student fails to meet all the conditions for the eligibility of Degree within the maximum stipulated period as in 5.4.1, his admission stands cancelled.

6.0. Examination system and evaluation

6.1. Examination system: Progress in all the components taken up by all students from the programme of study in any semester will be examined through

(i) Components evaluated internally and
(ii) Through an Semester-End examination, normally conducted and evaluated by external examiners.

6.1.1. Distribution of components for examination and evaluation:

Details are shown in the Table 2.

Table-2: Distribution of Marks

S. No	Nature of examination	Marks	Type of examination and mode of assessment		Scheme of examination
1	Theory	60	Semester-End examination (External evaluation)		The examination question paper in theory subjects will be for a maximum of 60 marks *Note: The question paper is to be set for 60 marks for a duration of 3 hours. The question paper should consist of 8 questions of 12 marks each, out of which 5 questions are to be answered.
		40	Mid-term Examination (Internal evaluation)		Two mid-term examinations each for 40 marks will be conducted. Better of the two mid-term examination marks will be considered for final internal marks. Mid-I: After first spell of instructions. (I-IV Units). Mid-II: After second spell of instructions. (V-VIII Units). *Note: For Mid-term examinations, the question paper is to be set for 40 marks for a duration of 2 hours. The question paper should consist of Sections 'A' and 'B'. Section-A: Consists of ten (10) objective type questions of one mark each. Section-B: Consists of four (4) descriptive questions of ten (10) marks each, out of which three questions are to be answered.
2	Practical	50	Semester-End Practical Examination (External evaluation)		50 marks are allotted for the laboratory examination during Semester-End Practical Examination.
		25	Day to Day evaluation		It is based on the performance in laboratory experiments and Record work.
3	Mini Project	75	50	External evaluation	Semester-End Viva-Voce Examination
			25	Internal evaluation	Continuous evaluation by the Departmental Committee (DC)*
4	Project work	200	150	External evaluation	Semester-End Viva-Voce Examination
			50	Internal evaluation	Continuous evaluation by the DC

* Refer section 9.2.

6.1.2. Attendance Requirements: Attendance in all the components is compulsory while pursuing studies in any semester and shall reckon as:

1. A student shall be eligible to appear for End examinations if he acquires a minimum of 75% of attendance in aggregate in all the subjects during a semester.
2. Shortage of Attendance below 65% in aggregate shall in no case be condoned.
3. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee.
4. A student whose shortage of attendance is not condoned in any semester will not be eligible to take the Semester-End examination of that class and their registration shall stand cancelled.
5. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the present semester, as applicable. They may seek readmission for that semester when offered next.
6. A stipulated fee shall be payable towards Condonation of shortage of attendance to the College.

6.1.2.1. Condonation of Shortage of Attendance

In special cases and for sufficient cause shown, the Principal, on the recommendation of the Head of the Department, may condone the deficiency not exceeding 10% in attendance. However the candidate has to submit a requisition and pay prescribed fee.

6.2. Eligibility for appearing for the end-semester examination

6.2.1. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in 6.1.2.

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory/practical/mini project/project, if he secures not less than 40% of marks in the Semester-End examination and a minimum of 50% of marks in the sum total of the internal evaluation and Semester-End examination taken together.
ii. A student shall register in all subjects and clear all subjects. Marks obtained in all subjects shall be considered for the calculation of the division based on CGPA obtained.
iii. Students who fail to clear all subjects as indicated in the course structure within six academic years from the year of their admission shall forfeit their seat in MCA course and their admission shall stand cancelled.

6.2.2. Detention: A student is said to have been detained and not allowed to appear for Semester-End examination:

If the student has not secured minimum of 65% attendance in all the subjects in aggregate in that semester.

When a student is detained as specified above, he will have to repeat that semester when offered next and he will not be allowed to register for the subjects of subsequent semesters. Students who are detianed for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, **and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted.**

6.2.3. Eligibility: In any semester, students satisfying the attendance requirement, shall pay the prescribed examination fee and appear for the Semester-End examination. They will be issued Hall Tickets and these should be carried with them into the examination hall.

6.3. Evaluation: Following procedures govern the evaluation.

6.3.1. Marks for components evaluated internally by the faculty should be submitted to the Controller of Examinations one week before the commencement of the Semester-End examinations.

6.3.2. The Controller of Examinations will also collect the evaluated answer scripts of the Semester-End examinations from the external examiners and tabulate the marks. The marks of the internal evaluation components will be added to the external examination marks secured in the Semester-End examinations to obtain the total marks in any subject in that semester.

6.3.3. Performance in all the courses is tabulated course-wise and will be scrutinized by the Examinations Committee. Moderation shall be applied, if necessary, and course-wise marks lists are finalized.

6.3.4. The total marks obtained in any subject are converted by the Controller of Examination into letter grades (as per Table-3).

6.3.5. Student-wise tabulation is done at this stage and student-wise memorandum of grades (Grade Sheet) is generated. A copy of the same is issued to the individual student.

6.4. Personal verification/Revaluation/Recounting: A student can apply for Personal verification/Revaluation/Recounting within a stipulated time after receiving the grade sheet:

(i) For recounting/personal verification of the marks secured in the Semester-End examinations by paying the prescribed fee or

(ii) For revaluation of the Semester-End examination answer script by paying the prescribed fee.

After the recounting or revaluation, if any changes are made, the records are updated accordingly. The student will be issued a revised grade sheet. If there are no changes, the student shall be intimated the same through a letter or a notice.

6.5 Grading: After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted into letter grades on a "**10 point scale**" as given in the Table 3.

Table-3: Grade conversion and Grade points allotted

% of marks Obtained	Grade	Description of Grade	Grade Points (GP)
>=95	O+	Extraordinary	10
>=90 & <95	O	Outstanding	9
>=80 & <90	A+	Excellent	8
>=70 & <80	A	Very Good	7
>=60 & <70	B	Good	6
>=55 & <60	C	Fair	5
>=50 & <55	D	Pass	4
Less than 50	F	Fail	0
Not Appeared	N	Absent	0

- **Pass Marks:** A student is declared to have passed in theory, laboratory and mini project/project, if he secures minimum of 40% marks in external examination, and a minimum of 50% marks in the sum total of internal evaluation and external examination taken together. Otherwise he will be awarded fail grade (F-Grade).
- **F** is considered as a FAIL grade indicating that the student has to pass the Semester-End component of that subject in supplementary examinations.
- **N** is considered as absent grade indicating that the student has to pass the Semester-End component of that subject in supplementary examinations.

6.6. Supplementary Examination

Apart from the regular Semester-End examination held at the end of each semester, the College may also schedule and conduct supplementary examinations for all subjects of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations as supplementary candidates, may have to write more than one examination per day.

6.7. Grade Point Average (GPA):

Every semester, after all the components and sub-components of all the subjects prescribed in the curriculum, a Grade Point Average (GPA) on a 10 point scale as an index of the student's performance in that semester will be calculated as given below:

$$GPA = \frac{\sum(C \times GP)}{\sum C}$$

Where ***C*** denotes the credits assigned to courses undertaken in that semester and *GP* denotes the grade points earned by the student in the respective courses.

***** GPA is calculated for the candidates who passed all the courses in that semester.

6.8. Cumulative Grade Point Average:

At the end of every semester, a Cumulative Grade Point Average (CGPA) is computed on a ten point scale considering all the courses completed successfully up to that point as an index of the overall performance up to that point.

$$CGPA = \frac{\sum(C \times GP)}{\sum C}$$

Where ***C*** denotes the credits assigned to courses undertaken upto the end of the current semester and *GP* denotes the grade points earned by the student in the respective courses.

***** The CGPA is awarded only when a student passes in all the courses prescribed for the programme.

6.9. Grade Sheet: A grade sheet (Marks Memorandum) will be issued to each student indicating his performance in all the courses registered in that semester indicating the GPA.

6.10. Transcripts: After successful completion of the total programme of study, a transcript containing performance of all the academic years will be issued as a final record. Duplicate transcripts will be issued on payment of the prescribed amount of fee.

Partial transcript will also be issued up to any point of study to a student on request after paying the stipulated fee to the Controller of Examinations.

7. Award of Degree: The Degree will be conferred and awarded by Jawaharlal Nehru Technological University, Anantapur on the recommendations of the Principal, SVEC (Autonomous) basing on the eligibility as mentioned in clause 7.1.

7.1. Eligibility: A student shall be eligible for the award of MCA Degree if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the programme of study to which he was admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his study within the stipulated time.
- Earned the specified credits in all the categories of courses.
- Obtained a CGPA of 4.0 or more. (Minimum requirements for Pass).
- Has no dues to the College, Hostel, Libraries, NCC/NSS etc. and any other amenities provided by the College.
- No disciplinary action is pending against him.

7.2. Award of Class : Declaration of the class basing on CGPA will be as stipulated in Table 4.

Table-4: Criterion for the award of Class.

Cumulative Grade Point Average	Class
> = 7.0	First Class with Distinction
> = 6.0 and < 7.0	First Class
> = 5.0 and < 6.0	Second Class
> = 4.0 and < 5.0	Pass

7.3. The Princial, SVEC (Autonomous) shall approve and recommend to the Jawaharlal Nehru Technological University, Anantapur for the award of Degree to any student.

8. Payment of Fee: All the students have to pay the fee of any kind prescribed by SVEC (Autonomous) as per the rules in force.

9. Evaluation of Project Work:

Every candidate shall be required to submit an abstract after taking up a topic approved by the Department.

9.1 Registration of Project work: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (Theory and Practical courses of I to V Semester).

9.2 The Departmental Committee (D.C) consisting of HOD, Supervisor and a senior faculty member shall monitor the progress of the project work.

9.3 The work on the project shall be initiated in the penultimate semester and continued in the final semester. The candidate can submit Project work with the approval of D.C. at the end of the VI semester. Extension of time within the total permissible limit for completing the programme is to be obtained from the College Academic Council (C.A.C).

9.4 The student shall submit status report in two different phases, in addition to oral presentation before the D.C. The D.C. shall evaluate the Project based on the progress, presentations and quality of work.

9.5 A candidate shall be allowed to submit the project report only after passing all the subjects up to V Semester and then take viva-voce examination of the Project. The viva-voce examination may be conducted once in three months for all the eligible candidates who have not appeared.

9.6 The viva-voce examination may be conducted for all the candidates as per the VI semester examination schedule.

9.7 Three copies of the project report duly certified by the supervisor & HOD shall be submitted to the Department. One copy is to be submitted to the Principal, SVEC and one copy is to be sent to the Examiner.

9.8 The HOD shall submit a panel of three experts for a maximum of every 10 students. However, the examiners for conducting viva-voce examination will be nominated by the Chief Controller of Examinations (Principal), SVEC.

9.9 If the report of the examiner is favorable, viva-voce examination shall be conducted by a board consisting of the Supervisor, Head of the Department and the Examiner who adjudicated the project report. The board shall jointly evaluate the student's performance and award the marks for a maximum of 150.

9.10 If the candidate fails to get 40% of marks in viva-voce examination, the candidate will have to reappear for the viva-voce examination after three months. If he fails in the second viva-voce examination he will not be eligible for the award of the Degree unless the candidate is permitted to revise and resubmit the project report.

10. Withholding of Results:

If the candidate has not paid dues to the University/College (or) if any case of indiscipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of Degree is liable to be withheld in all such cases.

11. Additional academic regulations:

1. A student can appear for any number of supplementary examinations till he clears all the courses in which he could not clear in the first attempt.
2. In the above, student has to clear all the eligibility requirements within the maximum stipulated period of six years. The maximum stipulated period cannot be relaxed under any circumstances.
3. A grade sheet (marks memorandum) will be issued to the student indicating his performance in all the courses of that semester along with the GPA and CGPA.
4. A transcript containing the performance in all the components required for eligibility for award of the Degree will be issued to the student.
5. Any attempt to impress upon the examiners, faculty, staff or Controller of Examinations, attempting to any unfair means or canvassing either for marks or for attendance will be treated as malpractice and the student shall be debarred from the College.
6. Courses like Projects/Mini-Projects can be repeated only by re-registering for all the components.
7. When a student absents himself, he is treated as to have appeared and obtained zero marks in that component (subject) and Grading is done so.
8. When a component is cancelled as a penalty, he is awarded **zero marks** in that component.

12. RE-REGISTRATION FOR IMPROVEMENT OF MARKS:

Following are the conditions to avail the benefit of improvement of internal marks.

12.1 The candidate should have completed the course work and obtained examinations results upto V semester.

12.2 A candidate shall be given one chance for a maximum of Three Theory subjects for Improvement of Internal evaluation marks for which the candidate has to re-register for the chosen subjects and fulfill the academic requirements.

12.3 For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of the Principal, Sree Vidyaniketan Engineering College payable at Tirupati along with the requisition through the Director MCA.

12.4 In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the Semester-End Examinations marks secured in the previous attempt(s) for the re-registered subjects stand cancelled.

13. AMENDMENTS TO REGULATIONS

The Academic Council of Sree Vidyanikethan Engineering College (Autonomous) reserves the right to revise, amend, or change the Regulations, Schemes of Examinations, and/or Syllabi or any other policy/rule pertaining suitable to the needs of the society or industrial requirements without any prior notice.

14. General:

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

15. ACADEMIC CALENDAR

The duration for each semester shall be for 17 weeks of instruction.

I Semester	Instruction Period: Internal Examinations:	I Spell : 9 weeks II Spell : 8 weeks I Mid : 1 week II Mid : 1 week	19 weeks
	Practical Exams & Preparation		1 week
	Semester-End Examinations		2 weeks
	Semester Break (One Week)		
II Semester	Instruction Period: Internal Examinations:	I Spell : 9 weeks II Spell : 8 weeks I Mid : 1 week II Mid : 1 week	19 weeks
	Practical Exams & Preparation		1 week
	Semester-End Examinations		2 weeks
	Summer Vacation (Four Weeks)		
III Semester	Instruction Period: Internal Examinations:	I Spell : 9 weeks II Spell : 8 weeks I Mid : 1 week II Mid : 1 week	19 weeks
	Practical Exams & Preparation		1 week
	Semester-End Examinations		2 weeks
	Semester Break (One Week)		
IV Semester	Instruction Period: Internal Examinations:	I Spell : 9 weeks II Spell : 8 weeks I Mid : 1 week II Mid : 1 week	19 weeks
	Practical Exams & Preparation		1 week
	Semester-End Examinations		2 weeks
	Summer Vacation (Four Weeks)		
V Semester	Instruction Period: Internal Examinations:	I Spell : 9 weeks II Spell : 8 weeks I Mid : 1 week II Mid : 1 week	19 weeks
	Practical Exams & Preparation		1 week
	Semester-End x Examinations		2 weeks
	Semester Break (One Week)		
VI Semester	Project Work		22 weeks

Note : *Failure to read and understand the regulations is not an excuse.*

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

MCA COURSE STRUCTURE

MCA I-Semester:

Course Code	Name of the Course	Hrs. per week			Credits	Maximum Marks		
		L	T	P		Internal Exams	External Exams	Tot
10MC1HS01	ACCOUNTING AND FINANCIAL MANAGEMENT	4	1	0	4	40	60	10
10MC10101	DISCRETE MATHEMATICAL STRUCTURES	4	1	0	4	40	60	10
10MC10102	PROGRAMMING THROUGH C	4	1	0	4	40	60	10
10MC10103	DATA STRUCTURES	4	0	0	4	40	60	10
10MC1HS02	ENGLISH LANGUAGE COMMUNICATION SKILLS	2	0	0	2	40	60	10
10MC10104	DATA STRUCTURES LAB (THROUGH C) LAB	0	0	3	2	25	50	7
10MC1HS03	ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB	0	0	3	2	25	50	7
10MC10105	IT-WORKSHOP*	0	0	3	-	-	-	-
	Total	**18**	**3**	**9**	**22**	**250**	**400**	**65**

*** Audit Course**

MCA II-Semester:

Course Code	Name of the Course	Hrs. per week			Credits	Maximum Marks		
		L	T	P		Internal Exams	External Exams	Tot
10MC2BS01	PROBABILITY AND STATISTICS	4	1	0	4	40	60	10
10MC20101	COMPUTER ARCHITECTURE AND ORGANIZATION	4	1	0	4	40	60	10
10MC20102	OPERATING SYSTEMS	4	0	0	4	40	60	10
10MC20103	OBJECT ORIENTED PROGRAMMING	4	1	0	4	40	60	10
10MC20104	DATABASE MANAGEMENT SYSTEMS	4	1	0	4	40	60	10
10MC20105	OBJECT ORIENTED PROGRAMMING LAB	0	0	3	2	25	50	7
10MC20106	DATABASE MANAGEMENT SYSTEMS LAB	0	0	3	2	25	50	7
	Total	**20**	**4**	**6**	**24**	**250**	**400**	**65**

MCA III-Semester:

Course Code	Name of the Course	Hrs. per week			Credits	Maximum Marks		
		L	T	P		Internal Exams	External Exams	Tot
10MC3BS01	OPERATIONS RESEARCH	4	1	0	4	40	60	10
10MC30101	WEB APPLICATION DEVELOPMENT	4	1	0	4	40	60	10
10MC30102	COMPUTER NETWORKS	4	1	0	4	40	60	10
10MC30103	DATA WAREHOUSING AND DATA MINING	4	1	0	4	40	60	10
10MC30104	SOFTWARE ENGINEERING	4	0	0	4	40	60	10
10MC30105	WEB APPLICATION DEVELOPMENT AND NETWORKS LAB	0	0	3	2	25	50	7
10MC30106	DATA WAREHOUSING AND DATA MINING LAB	0	0	3	2	25	50	7
	Total	**20**	**4**	**6**	**24**	**250**	**400**	**65**

MCA IV-Semester:

Course Code	Name of the Course	Hrs. per week			Credits	Maximum Marks		
		L	T	P		Internal Exams	External Exams	Tot
10MC4HS01	ORGANIZATIONAL BEHAVIOUR AND HUMAN RESOURCE MANAGEMENT	4	0	0	4	40	60	10
10MC40101	UNIX PROGRAMMING USING C++	4	0	0	4	40	60	10
10MC40102	MULTIMEDIA APPLICATION DEVELOPMENT	4	1	0	4	40	60	10
	Elective I	4	0	0	4	40	60	10
	Elective II	4	0	0	4	40	60	10
10MC40111	UNIX PROGRAMMING USING C++ LAB	0	0	3	2	25	50	7
10MC40112	MULTIMEDIA APPLICATION DEVELOPMENT LAB	0	0	3	2	25	50	7
10MC4HS02	ADVANCED COMMUNICATION SKILLS	0	0	3	-	-	-	-
	Total	**20**	**1**	**9**	**24**	**250**	**400**	**65**

***Audit Course**

Elective I:	**Elective II:**
10MC40103: Information Security	10MC40107: Advanced DBMS
10MC40104. Information Retrieval Systems	10MC40108: Software Project Management
10MC40105: Business Intelligence	10MC40109: Design and Analysis of Algorithms
10MC40106: Computer Vision	10MC40110: Software Architecture

V Semester

Course Code	Name of the Course	Hrs. per week			Credits	Maximum Marks		
		L	T	P		Internal Exams	External Exams	Tota
10MC50101	OBJECT ORIENTED ANALYSIS AND DESIGN	4	0	0	4	40	60	
10MC50102	MANAGEMENT INFORMATION SYSTEMS	4	0	0	4	40	60	
10MC50103	MIDDLEWARE TECHNOLOGIES	4	0	0	4	40	60	
	Elective III	4	0	0	4	40	60	
	Elective IV	4	0	0	4	40	60	
10MC50112	MIDDLEWARE TECHNOLOGIES AND UML LAB	0	0	3	2	25	50	
10MC50113	MINI PROJECT	0	1	0	2	25	50	
10MC50114	SEMINAR	0	1	0	-	-	-	
	Total	20	1	6	**24**	**250**	**400**	

***Audit Course**

Elective III:	**Elective IV:**
10MC50104: E-Commerce	10MC50108: Cloud Computing
10MC50105: Mobile Computing	10MC50109: Service Oriented Architecture
10MC50106: Software Testing	10MC50110: Enterprise Resource Planning
10MC50107: Semantic Web	10MC50111: Software Quality Assurance

VI Semester

Course Code	Name of the Course	C	Maximum Marks		
			Internal Marks	External Marks	Total
10MC60101	Project Work	12	50	150	200

TOTAL CREDITS: 130

TOTAL MARKS: 3450

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

MCA I-SEMESTER

10MC1HS01: **ACCOUNTING AND FINANCIAL MANAGEMENT**

L	T	P	C
4	1	0	4

UNIT–I

Introduction to Accounting: Principles, concepts and conventions, double entry system of accounting, classification of accounts, journal, ledger and trail balance.
Computerized Accounting: Introduction to computerized accounting system – advantages of computerized accounting system.

UNIT–II
Preparation of Financial Statements: Trading account, profit and loss account and balance sheet (with simple adjustments).

UNIT-III

Financial Analysis Through Ratios: Analysis and interpretation of financial statements.
Ratio Analysis: Liquidity ratios, solvency ratios, activity ratios and profitability ratios (with simple problems).

UNIT-IV

Financial Management: Meaning and scope, role and objectives.
Goals of Financial Management: Profit maximization, wealth maximization, EPS maximization, overcapitalization, undercapitalization, causes for overcapitalization and undercapitalization.

UNIT-V

Funds Flow and Cash Flow Analysis: Meaning, importance, statement of changes in working capital, statement of sources and application of funds.
Cash Flow Analysis: Cash flow statements-preparation, analysis and interpretation (with simple adjustments).

UNIT-VI

Break Even Analysis: Cost concepts, concept of Break Even Point (BEP), cost-volume-profit analysis, determination of BEP, margin of safety and profit/volume (P/V) ratio, impact of changes in cost or selling price on BEP, practical applications of break even analysis (make or buy, add or drop, choosing the product mix with a limiting factor).

UNIT-VII

Capital and its significance: Types and cost of capital, methods and sources of raising capital, leverage analysis (operating, financial and combined).
UNIT-VIII

Capital Budgeting: Features, proposals, methods of capital budgeting, payback method, Accounting Rate of Return (ARR), time value of money, Net Present Value method (NPV) and Internal Rate of Return (IRR) – simple problems.

TEXT BOOKS:

1. *Accounting and Financial Management,* A.R. Aryasri, Tata McGraw Hill Education Pvt. Ltd., 1st Edition
2. *Financial Management and Policy*, James C Van Horne, Prentice-Hall of India/Pearson, 12th Edition

REFERENCE BOOKS:

1. *Financial Accounting*, S P Jain and K.L.Narang, Kalyani Publishers, 2009
2. *Financial Accounting*, P.C. Tulsian, Pearson Education, 2004
3. *Financial Management*, I.M. Pandey, Vikas Publishing House Pvt. Ltd., 9th Edition

MCA I-SEMESTER

10MC10101: **DISCRETE MATHEMATICAL STRUCTURES**

L	T	P	C
4	1	0	4

UNIT-I

Mathematical Logic: Statements and notations, connectives, well formed formulae, truth tables, tautology, equivalence of formulas, normal forms.

UNIT-II

Predicates: Predicate calculus, free and bound variables, rules of inference, consistency, proof of contradiction and automatic theorem Proving.

UNIT-III

Relations: Properties of binary relations, equivalence relations, compatibility relations partial ordering relations, Hasse diagrams.
Functions: Inverse functions, composition of functions, recursive functions, Lattice and its properties.

UNIT-IV

Algebraic Structures: Algebraic system examples and general properties, semi groups and monoids, groups, subgroups, homomorphism and isomorphism.

UNIT-V

Mathematical Reasoning: Methods of proof, mathematical induction.
Counting: Basics of counting, the inclusion- exclusion principle, the pigeon hole principle, permutations and combinations, generalized permutations and combinations.

UNIT-VI

Recurrence Relation: Generating functions of sequences, calculating coefficients of generating function, recurrence relation, solving recurrence relations by substitution and generating functions, methods of characteristic roots, solutions of Iinhomogeneous recurrence relation.

UNIT-VII

Graphs: Introduction to graphs, types of graphs, graph basic terminology and special types of simple graphs, representation of graphs and graph isomorphism, Euler paths and circuits, Hamiltonian paths and circuits, Planar graphs, Euler's formula and graph coloring.

UNIT-VIII

Trees: Introduction to Trees, Properties of Trees, Binary Search Trees, Spanning Trees, Depth-First Search, Breadth-First Search, Minimum Spanning Trees, Kruskal's Algorithm and Prim's Algorithm.

TEXT BOOKS:

1. *Discrete Mathematical Structures with Applications to Computer Science*, J.P. Trembly and R. Manohar, Tata McGraw Hill, 1997.
2. *Discrete Mathematics and its Applications*, Kenneth H. Rosen, Tata McGraw Hill, 6th Edition.

REFERENCES:

1. *Discrete Mathematics for Computer Scientists and Mathematicians,* Joe L.Mott and Abraham Kandel, Prentice Hall of India Pvt. Ltd., 2nd Edition
2. *Elements of Discrete Mathematics*, C.L. Liu and D.P. Mohapatra, McGraw Hill, 3rd Edition.
3. *Discrete and Combinatorial Mathematics - An Applied Introduction,* Ralph P. Grimaldi and B.V.Ramana, Pearson Education, 5th Edition
4. *Discrete Mathematical Structures: Theory and Applications*, D.S Mallik and M.K Sen, Course Technology, 2004.
5. *Mathematical Foundations of Computer Science*, D.S.Chandrasekharaiah, Prism books Pvt. Ltd., 2nd Edition.

MCA I-SEMESTER

10MC10102: **PROGRAMMING THROUGH C**

L	T	P	C
4	1	0	4

UNIT-I

Introduction to Programming: Algorithm, flowchart, software tools for programming, compilation process, overview of C language, C tokens: variables, constants, keywords, operators and special characters. Data types, anatomy of a C program, expressions, precedence and associativity of operators, type casting and formatted I/O statements.

UNIT-II

Program Control Statements: Two way selection: if, if else, nested if else, multi way selection: else-if ladder and switch statement, Repetition: concept of loop, for loop, while loop, do while loop, break, continue and goto statement.

Applications: **Fibonacci series generation and factorial calculation.**

UNIT-III

Arrays and Strings: Array concept, types of array: one dimensional, two dimensional and multi-dimensional array, Introduction to string, string representation and initialization, array of strings and string manipulation functions.

UNIT-IV

Pointers: Introduction, declaration and initialization, arithmetic operations on pointer, Near Vs far pointers, Array of pointers, pointer to an array, types of pointer: single, double and multi pointers, dynamic memory management functions: malloc, calloc, realloc and free, null pointer, wild pointer, constant pointer, dangling pointer, generic pointer and problems with pointers.

UNIT-V

Functions: Introduction to function, system defined and user defined function, Local and global variables, Parameter passing mechanism: pass by value and pass by reference, scope, storage classes, Recursion: recursive function, applications of recursion: factorial calculation and Fibonacci number generation.

UNIT-VI

Derived Data Types: Introduction to structure: structure declaration and initialization, anonymous structure, accessing operators, nested structure, array of structure, array within a structure, pointer to structure, passing structures through function, union: declaration, initialization and its usage, typedef, enumerated types and bit fields; application of structure with pointer: static and dynamic linked list representation.

UNIT-VII

Files & Preprocessor Directives: Introduction to file, types of file: binary and text file, operations on File: open, close, read, write and seek, program to implement sequential access and random access, preprocessor directive statements and its usage, command line argument and its usage.

UNIT-VIII

Text and Graphics Functions: Introduction to text window/screen, basic text I/O functions for use with windows: cprintf, cputs, cgets, putch, getche, screen manipulation functions: clrscrr, clreol, delline, gettext, gotoxy, insline, movetext, puttext, textmode, window, a simple program to implement text window function, text attribute control functions: textattr, textbackground, textcolor, textmode.

Basic Graphics functions: initgraph, putpixel, line, circle, setcolor, floodfill, a simple program to implement graphics function.

TEXT BOOKS:

1. *A Structured Programming Approach Using C*, Behrouz A Forouzan and Richard F. Gilberg, Thomson India Edition, Cengage Learning, 2007
2. *Graphics under C*, Yaswanth Kanetkar, BPB Publication, 1st Edition

REFERENCES:

1. Turbo C/C++ The complete Reference, Herbert Schildt, Osborne McGraw Hill

2. Programming in C – A Practical Approach, A. Mittal, Pearson Education,1st Edition

3. *Programming with C,* Byron S Gottfried and Jitender Kumar Chhabra, McGraw Hill Companies, 2nd Edition

MCA I-SEMESTER

10MC10103: **DATA STRUCTURES**

L	T	P	C
4	0	0	4

UNIT–I

Basic Concepts: Algorithm, pseudocode, the Abstract Data Type (ADT), model for an ADT, ADT implementations, generic code for ADTs, algorithm efficiency: big-O notation, theta notation, omega notation.

UNIT–II

Stacks: Concepts of Stack, Basic Stack Operations, Stack ADT and its Implementation, Applications: Recursion, Infix to Postfix Conversion, Postfix to Infix Conversion, Postfix to Prefix Conversion, Postfix Evaluation.

UNIT-III

Queues: Concepts of queue, basic queue operations, queue ADT and its implementation, various queue structures: circular queue, double ended queue, priority queue, applications: simulation, CPU scheduling in multiprogramming environment, round robin algorithm.

UNIT–IV

General Linear Lists: Basic operations, implementations: single linked list, double linked list, circular linked list, applications: stacks using linked list, queue using linked list, polynomial addition, sparse matrix implementation.

UNIT–V

Sorting and Searching: Sorting: Sort concepts, sort stability, sort efficiency, bubble sort, insertion sort, selection sort, quick sort, merge sort, heap sort.
Searching: Sequential search, binary search, analyzing search algorithms.

UNIT–VI

Introduction to Trees: Basic tree concepts, binary trees, general trees.
Binary Search Trees (BST): Basic concepts, BST operations, BST ADT, BST applications, threaded trees.

UNIT–VII

Height Balanced Trees: AVL Tree: AVL tree basic concepts, AVL tree implementations, AVL tree ADT, AVL tree algorithms.
Red Black Tree: Basic concepts, implementations.
Heaps: Basic concepts, heap implementation, heap ADT, heap Applications.

UNIT–VIII

Graphs: Basic concepts, operations, graph storage structures, graph algorithms, graph ADT, minimum spanning tree, Prims and Kruskals, Dijkstras Algorithm.

TEXT BOOKS:

1. *Data Structures – A Pseudocode Approach with C*, Richard F. Gilberg and Behrouz A. Forouzan, Thomson India Edition, 2nd Edition
2. *Classic Data Structures*, D. Samanta, Prentice-Hall India, 2004

REFERENCES:

1. *Data Structures and Algorithm Analysis in C*, Mark Allen Weiss, 2nd Edition
2. *Fundamentals of Computer Algorithms* Ellis Horowitz, Sartaj sahni and Sanguthevar Rajasekaran, Galgotia Publications Pvt. Ltd., 2004
3. *An Introduction to Data Structures with Applications,* Jean-Paul Tremblay and Paul G. Sorenson, Tata McGraw Hill Edition, 2nd Edition
4. *Fundamentals of Data Structures,* Ellis Horowitz and Sartaj Sahni, Galgotia Book Source, 1996

MCA I-SEMESTER

10MC1HS02: **ENGLISH LANGUAGE AND COMMUNICATION SKILLS**

L T P C
2 0 0 2

UNIT-I

Introduction to Communication: Definition, types, verbal and non-verbal communication, elements of communication, barriers in communication, factors and benefits of effective communication, communication at work place, difference between spoken and written communication.

UNIT-II

Vocabulary Building: Importance of vocabulary building, synonyms and antonyms, word roots, one word substitutes, prefixes and suffixes, idioms and phrases, commonly misused words, homonyms, homophones and homographs.

UNIT-III

Listening Skills: Definition, importance of listening, features of effective listening, Types: active and passive listening, listening for purpose, listening for comprehension.

UNIT-IV

Technical Presentations: Definition, types of presentation, video conferencing, importance of presentation skills, making a successful presentation, preparation, structure of presentation.

UNIT-V

Interview Skills: Purpose of interviews, characteristics of job interview, different styles in interviews, preparation for an interview, formal and informal interviews.

UNIT-VI

Reading Skills: Definition, importance of reading skills, purpose, types and techniques.
Reading Strategies: Skimming, scanning, intensive reading and extensive reading.
Study Skills: Note making, note taking and critical / creative writing.

UNIT-VII

Writing Skills: Definition, importance of writing, features of effective writing.
Letter Writing: Business letters, format-style, effectiveness, promptness, analysis of sample letters, email and fax collected from industry and other sources.

UNIT-VIII

Technical Report Writing: Definition, business and technical reports.
Types of Reports: Progress reports, routine reports, annual reports, formats, analysis of sample reports from industry, preparation of a mini project report, synopsis and thesis writing.

REFERENCES:

1. *Essentials of Business Communication*, Rajendra Pal and J.S. KorlahaHi, Sultan Chand and Sons, 2006
2. *Basic Communication Skills for Technology*, Andrea J. Rutherford, Pearson Education Asia, 2nd Edition
3. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009
4. *Business Communication Theory and Application*, Raymond V. Lesikav and John D.Pettit Jr, All India Traveller Bookseller
5. *Business Communication*, RK Madhukar, Vikas Publishing House Private Limited, 1st Edition
6. Effective Technical Communication, M Ashraf Rizvi, Tata McGraw Hill , 2009
7. *Writing Remedies: Practical Exercises for Technical Writing*, Edmond H Weiss, University Press
8. *GRE Premier Program*, Eric Goodman, Ray Ojserkas and Bob Verini, Kaplan Publishing, 2009

MCA I-SEMESTER

10MC10104: **DATA STRUCTURES LAB (Through C)**

L	T	P	C
0	0	3	2

1) Write a C program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula. If the discriminant b^2-4ac is negative; display a message stating that there are no real solutions.
2) The Fibonacci sequence is defined by the following rule. The fist two values in the sequence are 1 and 1. Every subsequent value is the run of the two values preceding it. Write a C program to print the n Fibonacci Prime Numbers.
3) Write a C program to read in a three digit number produce following output (assuming that the input is 347)
   3 hundreds
   4 tens
   7 units
4) Write a C Program
   a) To insert a substring into a given main string from a given position
   b) Write a C program to delete n characters from a given position in a given string
5) Write a C non recursive and recursive function for the following task
   a. Calculating Factorial
   b. Swapping the values of two variable
   c. Minimum/maximum value from the given input
   d. Nth Fibonacci number
   e. GCD of a Given Number
   f. Towers of Hanoi

6) Write a C program to add, subtract and multiply two matrices using functions (Ppassing arrays as arguments to the function)
7) Write a C program
a) That creates an employee text file? Records are empid, empname, designation, qualification, salary, experience, research work, address, city phone?
b) That manipulates the above text file. The program must implements the operation to modify a record, delete a record and append new records.
c) To Reverse The First N Characters in a File
d) To Merge Two Files Into a Third File
8) Write a C program to count the number of vowels, consonants, digits, spaces, other symbols, words and lines in a given text file
9) Write C programs that implement stack (its operations) using
   i) Arrays ii) Pointers
10) Write a C program that uses Stack operations to perform the following:
   i) Converting infix expression into postfix expression
   ii) Evaluating the postfix expression
11) Write C programs that implement Queue (its operations) using
   i) Arrays ii) Pointers
12) Write a C program that uses functions to perform the following operations:
   i) Creation ii) Insertion iii) Deletion iv) Traversal on
   a) singly linked list b) doubly linked list c) circular linked list
13) Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
   i) Linear search ii) Binary search
14) Write a C program that implements the following sorting methods to sort a given list of integers in ascending order
   i) Bubble sort ii) Selection sort iii) Quick sort iv) Merge sort
15) Write C program to create BST and perform operations on it.
16) Write C program to implement recursive and non recursive Tree traversal techniques.
17) Write a C Program to implement Traversals of graph i.e (BFS and DFS).
18) Write a C program to simulate simple Text Editor.
19) Write a C program to draw the following using graphics functions
   i) Line ii) circle iii) square iv) triangle v) filled triangle vi) filled circle vii) draw cartoon
20) Write a C program to display village map by using drawing functions.

MCA I-SEMESTER

10MC1HS03:**ENGLISH LANGUAGE & COMMUNICATION SKILLS LAB**

L	T	P	C
0	0	3	2

1. Introduction to the sounds of English-Vowels, Diphthongs & Consonants
2. Introduction to stress and Intonation.
3. Functional English
4. Conversation Starters
5. Situational Dialogues / Role Play
6. 'Just A Minute' Session (JAM).
7. Public Speaking
8. Oral presentation – prepared and extempore

Suggested software:

- Cambridge advanced learner's English dictionary with CD.
- The rosetta stone English library.
- Clarity pronunciation power – part-I
- Mastering English-vocabulary, grammar, punctuation and composition.
- Dorling Kindersley series of grammar, punctuation, composition etc.
- Language in use. Foundation books pvt. Ltd. with CD.
- Oxford advanced learner's compass 7th Edition.
- Learning to speak English – 4 CDs.
- Microsoft encarta CD.
- Murphy's English Grammar, Cambridge with CD.
- English in mind, Herbert Puchta and Jeff Stranks with Meredith levy, Cambridge.
- English pronunciation dictionary
- Speech solutions
- Sky pronunciation
- Tense Buster

REFERENCES:

1. *Essentials of Business Communication*, Rajendra Pal and J.S. KorlahaHi, Sultan Chand and Sons, 2006
2. *Basic Communication Skills for Technology*, Andrea J. Rutherford, Pearson Education Asia, 2nd Edition
3. *Technical Communication*, Meenakshi Raman and Sangeetha Sharma, Oxford University Press, 2009
4. *Business Communication Theory and Application*, Raymond V. Lesikav and John D.Pettit Jr, All India Traveller Bookseller
5. *Business Communication*, RK Madhukar, Vikas Publishing House Pvt. Ltd., , 1st Edition
6. Effective Technical Communication, M Ashraf Rizvi, Tata McGraw Hill, 2009
7. *Writing Remedies: Practical Exercises for Technical Writing*, Edmond H Weiss, University Press
8. *GRE Premier Program*, Eric Goodman, Ray Ojserkas and Bob Verini, Kaplan Publishing, 2009

MCA I-SEMESTER

10MC10105: **IT – WORKSHOP**

L	T	P	C
0	0	3	-

PC Hardware

Week 1: Identifying the peripherals of a Computer, components in a CPU and its functions, block diagram of CPU along with the configuration of each peripheral.

Week 2: Disassembling and assembling the PC back to working condition, videos for assembling and disassembling a PC.

Week 3: Introduction to Operating System (OS) as system software, features of OS, need of OS, components of OS, installation of Microsoft Windows XP Operating System on the personal computer, examples of operating systems.

Week 4: Introduction to UNIX OS and basic commands in UNIX such as cat, ls, pwd,, rm, rmdir, ln, head, tail, cd, cp, mv, who, date, cal, clear, man, tty, wc, diff, cmp, grep etc. and vi editors and sample C programs.

Week 5: Hardware and Software Troubleshooting: PC symptoms when computer malfunctions, types of faults, common errors and how to fix them, basic hardware and software troubleshooting steps, PC diagnostic tools.

MS Office 2007: MS Word

Week 6: Introduction to MS Word, importance of Word as Word Processor, overview of toolbars, saving, accessing files, using help and resources.

Create a word document using the features: Formatting fonts, drop cap, applying text effects, using character spacing, borders and shading, inserting headers and footers, using date and time option.

Week 7: Create a project using MS Word using the features: Inserting tables, bullets and numbering, changing text direction, hyperlink, images from files and clipart, drawing toolbar and word art, mail merge.

MS Excel

Week 8: Introduction to MS Excel as a Spreadsheet tool, overview of toolbars, accessing, saving excel files, using help and resources.

Create a spreadsheet using the features: Gridlines, format cells, summation, auto fill, formatting text, formulae in excel charts.

Week 9: Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, freeze panes, pivot tables, data validation.

MS PowerPoint

Week 10: Introduction to MS PowerPoint, utilities, overview of toolbars, PPT orientation, slide layouts, types of views.

Create a PowerPoint presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

Week 11: Create a PowerPoint presentation using the features: Auto content wizard, hyperlinks, Inserting images, clip art, audio, video, custom animation, slide hiding, tables and charts.

MS Publisher

Week 12: Introduction to MS Publisher, overview of toolbars, saving files, templates, layouts.

Create a website using the features: Home page, about us, Department, Contact page etc.

LaTex

Week 13: Introduction to LaTeX tool: Importance of LaTeX as document preparation system for high quality typesetting, accessing, overview of toolbars, saving files, overview of features like typesetting of article, journal, books, control over large documents, using help and resources.

Internet and World Wide Web

Week 14: Web Browsers, Search Engines: Introduction to types of networks, customizing web browsers with LAN proxy settings, bookmarks, search toolbars and popup blockers, types of search engines and how to use search engines.

Week 15: Cyber Hygiene: Introduction to various threats on Internet, types of attacks and how to overcome, installation of antivirus software, configuration of personal firewall and Windows update on Computers.

REFERENCES:

1. *Introduction to Computers*, Peter Norton, Tata McGraw Hill, 4th Edition
2. *IBM PC and Clone–Hardware, Troubleshooting and Maintenance,* B. Govindarajulu, Tata McGraw Hill, 2nd Edition
3. *Comdex Information Technology Course Kit,* Vikas Gupta, WILEY Dreamtech, 2nd Edition
4. *PC Hardware and A + Handbook*, Kate J. Chase, Prentice Hall India, 2004

5. *A Document Preparation System LaTeX User's Guide and Reference Manual,* Leslie Lamport, Pearson Education, 2nd Edition

MCA II-SEMESTER

10MC2BS01: **PROBABILITY & STATISTICS**

L T P C
4 1 0 4

UNIT-I

Probability: Random experiment, events, sample space, definitions of probability, addition and multiplication theorems of probability, conditional probability, simple problems on probability, Bayes theorem and related problems.

UNIT-II

Random Variables and Mathematical Expectation: Definition, discrete and continuous random variables, distribution function and its properties, probability mass function and probability density function of a random variable. Problems on random variables. Concept of mathematical expectation, addition and multiplication theorems on mathematical expectation.

UNIT-III

Probability Distributions: Discrete distributions, Binomial Distribution (B.D), mean and variance of B.D; Poisson Distribution (P.D), mean and variance of P.D; Derivation of P.D from B.D as a limiting case.

Continuous probability distribution, Normal Distribution (N.D), properties of N.D, importance of N.D, area properties of normal curve and problems.

UNIT IV

Estimation and Sampling Distributions: Point estimation, interval estimation, problems on interval estimation.

Sampling: Population, sample, sample mean, population mean, sample S.D, population S.D; parameter and statistic, sampling distribution of a statistic (sample mean and sample S.D).

UNIT-V

Large Sample Tests of Significance: Hypothesis, null hypothesis, alternative hypothesis, type-I and type-II errors, level of significance, critical region, degrees of freedom, one tailed and two tailed tests. Large sample test for population mean (when ó is known and unknown). Large sample tests of significance for one sample and two sample means, large sample tests of significance for one sample and two sample proportions.

UNIT-VI

Small Sample Tests of Significance: Student's t-test, F-test for equality of two population variances, chi-square test of goodness of fit, contingency table, chi–square test for independence of attributes.

UNIT-VII

Curve Fitting, Correlation and Regression: Curve fitting, method of least squares, fitting of a straight line, second degree parabola, exponential and power curves.

Correlation: types of correlation, measures of correlation, correlation for univariate and bivariate data.

Regression: Regression lines, regression coefficients, properties of regression coefficients.

UNIT-VIII

Statistical Process Control: Quality control, advantages and limitations of SQC, Specification and tolerance limits: X–Bar, R, p, np and C-charts.

TEXT BOOKS:

1. *Probability and Statistics*, T.K.V.Iyengar, B. Krishna Gandhi and others, S. Chand & Co, 3rd Edition
2. *Fundamentals of Mathematical Statistics*, S.C. Gupta and V.K.Kapoor, Sulthan Chand and Sons, 11th Edition
3. *Text book of Probability and Statistics*, Shanaz Bhatul, RIDGE Publications, 2nd Edition
4. *Fundamentals of Applied Statistics*, S.C. Gupta and V.K. Kapoor, S.Chand and Co, 3rd Edition

REFERENCES:

1. *Probability and Statistics for Engineers*, Richard A. Johnson, Prentice Hall of India, 7th Edition
2. *Probability and Statistics and Random Processes,* K.Murugesan and P.Gurusamy Anuradha Publications, 1st Edition

MCA II-SEMESTER

10MC20101:**COMPUTER ARCHITECTURE AND ORGANIZATION**

L T P C
4 1 0 4

UNIT-I

Data Representation: Data types, complements, fixed-point representation, floating-point representation, other binary codes and error detection codes, digital computers, logic gates, Boolean algebra and map simplification.

UNIT-II

Digital Logic Circuits & Digital Components (Functional Concepts Only): Combinational circuits, flip-flops, sequential circuits, integrated circuits, decoders, multiplexers, shift registers, binary counters.

UNIT - III

Central Processing Unit: Introduction, general register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, Reduced Instruction Set Computer (RISC).

UNIT - IV

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing and control, instruction cycle, Memory Reference Instructions, input-output and interrupt, complete computer description, design of basic computer, design of accumulator logic.

UNIT-V

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory.

UNIT –VI

Micro Programmed Control: Control memory, address sequencing, micro program example, design of control unit.

UNIT – VII

Input -Output Organization: Peripheral devices, input-output interface, asynchronous data transfer, modes of transfer, priority interrupts, Direct Memory Access (DMA) and Input-Output Processor (IOP).

UNIT – VIII

Parallel Computer Architectures: Pipelining, characteristics of multiprocessors, interconnection structures, shared memory multiprocessors, message passing multicomputers.

TEXT BOOKS:

1. *Computer System Architecture,* M. Morris Mano, Pearson Education, 3rd Edition
2. *Computer Architecture and Organization,* John P. Hayes, McGraw Hill, 3rd Edition

REFERENCES:

1. *Structured Computer Organization*, Andrew S. Tanenbaum, Pearson Education, 5th Edition
2. *Digital Electronics - An Introduction to Theory and Practice,* William H. Gothmann, Prentice Hall, 2nd Edition

MCA II-SEMESTER

10MC20102: OPERATING SYSTEMS

L	T	P	C
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UNIT-I

Operating Systems (OS): Introduction, Evolution of operating systems: Simple batch, multi programmed, time-shared, personal computer, parallel systems, distributed systems, real-time systems, operating system services, dispatching, system calls, operating system design and implementation, OS structure, virtual machines.

UNIT-II

File Systems: The concept of a file, access methods, directory structure, file system mounting, file sharing and protection.
Implementing File Systems: File system structure, file system implementation, directory implementation, allocation methods, recovery, New File Systems (NFS).
Case Study: Linux and Windows file system.

UNIT-III

Process concepts and CPU Scheduling : The process, process states, process control block, threads, preemptive scheduling, dispatcher, scheduling criteria, scheduling algorithms, multiple-processor scheduling, real-time scheduling, thread scheduling.
Case Study: Linux and Windows CPU scheduling.

UNIT-IV

Process Synchronization: The critical section problem, peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, monitors.
Case Study: Linux and Windows process synchronization.

UNIT-V

Deadlocks: System model, deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection and recovery.

UNIT-VI

Memory Management: Logical and physical address space, swapping, contiguous allocation, paging, segmentation, segmentation with paging, virtual memory, demand paging, copy-on-write, page replacement algorithms, allocation of frames, thrashing.
Case Study: Linux and Windows memory management.

UNIT-VII

Protection and Security: System protection, goals of protection, principles of protection, domain of protection, access matrix, implementation of access matrix, access control, revocation of access rights, the security problem and program threats.

UNIT-VIII

Recovery and Fault Tolerance: Faults, failures and recovery, Byzantine faults and agreement protocols, recovery, fault tolerance techniques, resiliency.

TEXT BOOKS:

1. *Operating System Principles*, Abraham Silberschatz, Peter B. Galvin and Greg Gagne, Wiley Student Edition, 8th Edition
2. *Operating Systems*, D.M Dhamdheere, Tata McGraw Hill, 2nd Edition

REFERENCES:

1. *Modern Operating Systems*, Andrew S Tanenbaum, Pearson/PHI, 3rd Edition
2. *Principles of Operating Systems*, B.L.Stuart, Cengage Learning, 2nd Edition
3. *Operating Systems*, A.S.Godbole, Tata McGraw Hill, 2nd Edition
4. *An Introduction to Operating Systems*, P.C.P Bhatt, PHI, 2nd Edition

5. *Operating Systems*, R.Elmasri, A.G.Carrick and D.Levine, McGraw Hill, 3rd Edition

MCA II-SEMESTER

10MC20103: **OBJECT ORIENTED PROGRAMMING**

L T P C
4 1 0 4

UNIT-I

Introduction to Object Oriented Programming (OOP): Programming paradigms, need of object oriented programming paradigm, difference between procedure oriented and object oriented programming. Object oriented programming principles, encapsulation, inheritance and polymorphism, Java buzzwords, JVM and JRE architecture, Java program structure, data types, variables, declaring variables, dynamic initialization, scope and life time of variables, arrays, operators, control statements, for each loop, type conversion and casting.

UNIT-II

Classes and Objects: Concepts of classes and objects, class fundamentals declaring objects, assigning object reference variables, introducing methods, types of methods: static, non-static methods. Usage of static with data and methods, usage of final with data, methods and classes, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing: call-by-value, recursion, nested classes and inner classes, wrapper classes, Object class.

UNIT-III

String Handling: String operations, character extraction, string comparison, modifying a string, data conversion using valueOf (), parsing functions.

Inheritance and Polymorphism: Basic concepts, member access rules, usage of super key word, forms of inheritance, method overloading, method overriding, abstract classes, dynamic method dispatch, using final with inheritance.

UNIT-IV

Interface: Basic concept, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Differences between classes and interfaces.

Package: Defining, creating and accessing a package, understanding CLASSPATH, importing packages, classes and interfaces of util package: Vector, Date, StringTokenizer, Formatter, Scanner, Random.

UNIT-V

Exception Handling and Multithreading: Concepts of exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes.

Multithreading: Concepts of multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, synchronization, thread priorities, daemon threads.

UNIT-VI

Managing I/O Files in Java: Concepts of streams, using streams, stream classes: Byte stream, Character stream, using streams, using the File class, I/O exceptions, creation of files, reading/writing characters and Bytes, concatenating and buffering files, random access files, Serialization, reading and writing objects to file.

UNIT VII

GUI Programming with Java: Abstract Window Toolkit (AWT) classes, window fundamentals, working with Frame windows, working with Color, Font. AWT controls, Layout managers and Menus. Event Handling - Events, Event sources, Event classes, Event listeners, relationship between Event sources and Listeners, delegation event model, semantic and low-level events.

UNIT VIII

Swings: Introduction to swings, hierarchy of swing components, containers: top-level containers, JFrame, JWindow, JDialog, light weight containers, JPanel, overview of several swing components: JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JMenu, JTable, JTree, JTabbedPanes, JScrollPanes, JApplet.

Applets: Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets and testing, passing parameters to applets, applet security issues.

TEXT BOOKS:

1. *The Complete Reference Java J2SE*, Herbert Schildt, Tata McGraw Hill, 7th Edition

REFERENCES:

1. *Object Oriented Programming with Java*, B.Eswar Reddy, T.V.Suresh Kumar and P.Ragavan, Pearson Sanguine Publications
2. *Java How to Program*, H.M.Dietel and P.J.Dietel, Pearson Education/PHI, 5th Edition

3. *Core Java 2, Vol 1, Fundamentals*, Cay.S.Horstmann and Gary Cornell,

MCA II-SEMESTER

10MC20104: **DATA BASE MANAGEMENT SYSTEMS**

L	T	P	C
4	1	0	4

UNIT–I

Introduction: File system, database, types of DBMS, database system applications, database system Vs file system, view of data, data models, database languages, database access from application programs, database users and administrator, transaction management, database system structure, history of data base systems.

UNIT–II

Entity-Relationship Model: Basic concepts, constraints, keys, design issues, Entity- Relationship diagrams, weak entity sets, Extended E-R features, design of an E-R database schema, reduction of an E-R schema to tables.

UNIT–III

SQL: Queries, Constraints and Triggers: Form of Basic SQL Query, examples of Basic SQL Queries, UNION, INTERSECT, EXCEPT , introduction to nested queries , correlated nested queries, set – comparison operators, aggregative operators, NULL values, comparison using NULL values, logical connectivities, AND, OR and NOT , impact on SQL Constructs , outer joins, disallowing NULL values, complex integrity constraints in SQL.

UNIT–IV

PL/SQL: Introduction, advantages of PL/SQL, generic PL/SQL block, PL/SQL environment: PL/SQL in Oracle Engine, data types, logical comparisons, conditional controls, Oracle transactions, CURSORS, cursor for loops, parameterized cursors, error handling in PL/SQL, database triggers.

UNIT–V

Schema Refinement and Normal Forms: Introduction to schema refinement, functional dependencies, reasoning about functional dependencies.

Normal Forms: First, Second, Third, Boyce-Codd, Other kinds of dependencies.

UNIT–VI

Overview of Transaction Management: The ACID Properties, transactions and schedules, concurrent execution of transactions, lock–based concurrency control, performance of locking, introduction to Crash Recovery.

Crash Recovery: Introduction to ARIES, the log, other recovery related structures, the Write-Ahead Log Protocol, check pointing, recovering from a system crash, media recovery.

UNIT–VII

Concurrency Control: 2PL, Serializability and Recoverability, introduction to lock management, lock conversions, dealing with deadlocks, specialized locking techniques.

Overview of Storage and Indexing: Data on external storage, file organization and indexing, index data structures.

UNIT–VIII

Storing Data: The memory hierarchy, Redundant Arrays of Independent Disks

Tree Structured Indexing: Intuitions for tree indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

Hash Based Indexing: Static hashing, extendable hashing.

TEXT BOOKS:

1. *Database Management Systems*, Raghurama Krishnan and Johannes Gehrke, TATA McGraw Hill, 3rd Edition
2. Database System Concepts, Silberschatz and Korth, McGraw Hill, 5th Edition

REFERENCES:

1. An Introduction to Database Systems, C.J.Date, Pearson Education, 7th Edition
2. *Database Systems Design, Implementation and Management*, Peter Rob and Carlos Coronel, Thomson Learning, 5th Edition
3. Database Management System, Elmasri and Navate, Pearson Education, 2006
4. *Database Management Systems*, Peter Rob, A. Ananda Rao and Carlos Coronel, Cengage Learning, 2005
5. *Fundamentals of Database Management Systems*, M.L.Gillenson, Wiley Student Edition.

MCA II-SEMESTER

10MC20105: **OBJECT ORIENTED PROGRAMMING LAB**

L T P C
0 0 3 2

1. a) Write a Java program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula. If the discriminant b^2-4ac is negative, display a message stating that there are no real solutions.

b) The Fibonacci sequence is defined by the following rule: The fist two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it.

C)Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

2. a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

b) Write a Java program to multiply two given matrices.

c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

3. Write a Java program to find both the largest and smallest number in a list of integers.

4. Write a Java program to illustrate method overloading.

5. Write a Java program that implements the Sieve of Eratosthenes to find prime numbers.

6. Write a Java program to sort a list of names in ascending order.

7. Write a Java program to implement the matrix ADT using a class. The operations supported by this ADT are:

   a) Reading a matrix.
   b) Printing a matrix.
   c) Addition of matrices.
   d) Subtraction of matrices.
   e) Multiplication of matrices.

8. Write a Java Program that uses a recursive function to compute NcR. (Note: n and r values are given.)

9. Write a Java program to perform the following operations:

   a) Read line of Text and make word cap.

   b) read a line of text and count number of vowels and consonants.

10. Write a Java program that makes frequency count of letters in a given text.

11. Write a Java program that uses functions to perform the following operations :

a) Inserting a sub-string in to the given main string from a given position.
b) Deleting n characters from a given position in a given string.

12. a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.

    b) Write a Java program to make frequency count of words in a given text.

13. Write a Java program that uses both stack and queue to test whether the given string is a palindrome.(By using Stack and Queue classes).

14. Write a Java program that illustrates the following

    a) Creation of simple package. b) Accessing a package. c) Implementing interfaces.

15. Write Java programs that illustrates the following

    a) Handling predefined exceptions
    b) Handling user defined exceptions

16. Implement the complex number ADT in Java using a class. The complex ADT is used to represent complex numbers of the form c=a+ib, where a and b are real numbers. The operations supported by this ADT are:

a) Reading a complex number.
b) Writing a complex number.
c) Addition of Complex numbers.
d) Subtraction of complex numbers.
e) Multiplication of complex numbers.
f) Division of complex numbers.

17. a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

c) Write a Java program that displays the number of characters, lines and words in a text file.

d) Write a Java program to change a specific character in a file.

Note: Filename , number of the byte in the file to be changed and the new character are specified on the command line.

18. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

19. Write a Java program for handling mouse events.

20. a) Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays "Welcome" every three seconds.

b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

21. Write a Java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

22. a) Write a Java program that simulates a traffic light. The program lets The user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.

b) Write a Java program that allows the user to draw lines, rectangles and ovals.

23. a) Write a Java program to create an abstract class named Shape that contains an empty method named number Of Sides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.

b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component.

24. a) Develop an applet in Java that displays a simple message.

b) Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.

MCA II-SEMESTER

10MC20106: **DATABASE MANAGEMENT SYSTEMS LAB**

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List of Sample Problems/Experiments

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using Select command.
2. Creation of simple queries using DML commands?
3. Queries using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSECT, MINUS, CONSTRAINTS?
4. Creation of Simple, Complex Views and dropping of Views?
5. Queries using
   a) Conversion functions (to_char, to_number and to_date)
   b) String functions(Concatenation,lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr, and instr)
   c) Date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunk, round, to_char, to_date)
6. Creation of Simple & Complex Nested Queries?
7. Queries using various JOIN (Equi joins, Inner Joins, Outer Joins)?
8. Queries using Aggregate functions (COUNT, SUM AVG, MAX, MIN), GROUPBY, HAVING clauses?
9. Implementation on Indexes and Sequences?
10. Creation of simple PL/SQL Program which includes declaration section, executable section & exception-Handling section for the given programs
    a) Find the biggest of the given number?
    b) Check whether the number is divisible by 5 or not?
    c) Find the factorial of a given number?
11. Creation of PL/SQL Program to
    a) Check whether the given input is a 'Special character' or 'Alphabet' or a 'Number'?
    b) Perform arithmetic operations?
    c) Check whether the given number is a prime or not?
12. Develop a PL/SQL program to calculate the Commission of an employee?
13. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
14. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT-IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.
15. Generation of Electricity-bill using Cursors?
16. Write a PL/SQL program to demonstrate the concept of the Parameterized Cursors?
17. Creation of
    a) Simple PL/SQL procedure to update the salary of an employee?
    b) Creation of Reference Cursors using procedures and Packages?
18. Develop programs using BEFORE and AFTER Triggers, Row and Statement TRIGGERS.?

MCA III Semester

10MC3BS01: OPERATIONS RESEARCH

L	T	P	C
4	1	-	4

UNIT –I

INTRODUCTION TO OR: Introduction, modeling in OR- Phases of OR study.
Linear Programming: Formulation of LPP, Graphical solution of LPP, Simplex method, Artificial variable technique, Duality principle.

UNIT –II

TRANSPORTATION PROBLEM: Finding an initial basic feasible solution, North-West corner rule, Least cost Entry method, Vogel's Approximation Method, Degeneracy in Transportation Problem, Optimality test: Unbalanced Transportation Problem, Maximization case in Transportation Problem.

UNIT –III

ASSIGNMENT PROBLEM: Hungarian method of Assignment Problem, Maximization in Assignment Problem, Travelling salesman Problem and its restrictions.

UNIT –IV

SEQUENCING PROBLEM: Introduction, Optimal solution for processing n-jobs through two machines, n-jobs through three machines and n-jobs through k-machines, 2-jobs through k-machines.

UNIT –V

REPLACEMENT PROBLEM: Introduction, Replacement of items that deteriorate when money value is constant and variable, Replacement of items that fail suddenly, Individual Replacement policy, Group Replacement policy.

UNIT – VI

THEORY OF GAMES: Introduction, Maximin-Minimax Principle, types of games, Optimal strategy, solution of games with saddle point, Rectangular games without saddle point, principle of dominance, graphical method for 2xn and mx2 games.

UNIT – VII

INVENTORY MODELS: Introduction, Reasons for maintaining inventories, types of inventory, Inventory costs, Deterministic inventory models: EOQ models with and without shortages, EOQ problems with one and two price breaks.

UNIT – VIII

PROJECT MANAGEMENT BY PERT/CPM: Basic steps in PERT/CPM technique, rules of drawing network diagrams, Fulkerson's rule: Critical Path Method (CPM), Project Evaluation and Review Technique (PERT).

TEXT BOOKS:

1. S.D. Sharma, *Operations Research*, 15th Edition, Kedar Nath Ram Nath & Co., 2006-07.
2. Kanthi Swarup, P.K.Gupta & Man Mohan, *Operations Research,* 12th Edition, Sulthan Chand and sons, 2006.
3. S. Kalavathy, *Operations Research*. 2nd Edition, Vikas Publishing House Pvt.Ltd, 2007.

REFERENCE BOOKS:

1. Hamdy A. Taha, *Operations Research*, 8th Edition, Pearson Publications, 2007.
2. Prem Kumar Gupta and D.S. Hira, *Operations Research,* 5th Edition, Sulthan Chand and Company, 2008.
3. J.K. Sharma, *Operations Research Theory and Applictaions,* 3rd Edition, Macmillan India Ltd, 2008.

MCA III Semester

10MC30101: WEB APPLICATION DEVELOPMENT

L	T	P	C
4	1	-	4

UNIT –I

HTML COMMON TAGS: List, tables, images, forms, frames, Cascading Style Sheets. Introduction to Java Script, Objects in Java Script, Dynamic HTML with Java Script.

UNIT –II

XML TECHNOLOGY: Role of XML , XML and The Web , XML Language basics ,SOAP, Web Services. XML: The Three Revolutions, XML Name Spaces, Structuring With Schemas: DTD, XML Schema, XML Processing, DOM, SAX, Presentation Technologies, Transformation, XML Infrastructure Technologies.

UNIT –III

JDBC : Introduction to JDBC, JDBC and ODBC,Types of Drivers, Java SQL Package, Using a JDBC, Driver Manager, Connection Interface, Statement Interface, PreparedStatement Interface,CallableStatement Interface, ResultSet Interface.

UNIT –IV

SERVLETS: Introduction to Servlets, Servlet Technology, Handling HTTP GET Requests, Handling HTTP POST Requests, Session Tracking. Multi-tier Applications:Using JDBC from a Servlet

UNIT –V

INTRODUCTION TO JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC, Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

UNIT –VI

JSP APPLICATION DEVELOPMENT: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data between JSP pages, Requests, and Users Passing Control and Date between Pages, Sharing Session and Application Data, Accessing a Database from a JSP Page, Application.

UNIT – VII

STRUTS APPLICATION DEVELOPMENT: Introducing the Jakarta Struts Project and its Supporting Components, Getting started with Struts, Actions and ActionServlet, Advanced Action Classes: ForwardAction and Beyond, Include Action, Dispatch Action.

UNIT – VIII

WEB SERVICES: Overview of SOAP, HTTP, XML, RPC, SOAP: Protocol, Message Structure, Intermediaries, Actors, Design Patterns and Faults, SOAP With Attachments.

TEXT BOOKS :

1. Hans Bergsten, *Java Server Pages*, 3rd Edition, SPD O'Reilly, 2010.
2. H. M. Deitel, P.J. Deitel and T. R. Nieto, *Internet and World Wide Web – How to program,* Pearson Education Asia, 2006.
3. Frank. P. Coyle, *XML, Web Services and the Data Revolution,* Pearson Education, 2008.

REFERENCE BOOKS:

1. Sebesta, *Programming World Wide Web,* 2nd Edition, Pearson Education, 2005.
2. Knuckles, John Wiley, *Web Applications Technologies Concepts*, 1st Edition, Wiley India Pvt Ltd, 2006.
3. Pekowsky, *Java Server Pages*, 2nd Edition, Pearson Education, 2008.
4. James Goodwill, Richard Hightower*, Professional Jakarta Struts 1.1,* 1st Edition, Wiley-Dreamtech India Pvt. Ltd, 2005.
5. Chatterjee, James Webber, Sandeep, *Developing Enterprise Web Services*, Pearson Education, 2004.
6. Dr. K. Somasundaram, *Programming in Java2*, Jaico Publishing House,2006.

MCA III Semester

10MC30102: COMPUTER NETWORKS

L	T	P	C
4	1	-	4

UNIT-I

INTRODUCTION: Uses of computer Networks, Network H/W-Topologies, Network S/W, Reference Models, Example Networks, Network Standardization.

UNIT-II

PHYSICAL LAYER: Analog and Digital, Periodic Analog and Digital signals, Multiplexing, Guided transmission media, Wireless Transmission, Communication satellites, Public switched telephone Network.

UNIT-III

DATA LINK LAYER: Design Issues, Error detection and correction, Elementary Data Link Protocols, Sliding Window Protocols, Protocol Verification, Example Data Link protocols.
The Medium Access Sub Layer: The channel allocation problem, Multiple access Protocols, Ethernet, Wireless LANs, Broadband Wireless, Bluetooth, Data Link Layer switching.

UNIT-IV

THE NETWORK LAYER: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, Network Layer in Internet.

UNIT-V

THE TRANSPORT LAYER: The Transport Service, Elements of Transport Protocol, A simple Transport Protocol, Internet Transport Protocols: UDP, TCP, Performance Issues.

UNIT-VI

THE APPLICATION LAYER: DNS(Domain Name System), Electronic Mail, World Wide Web, Multimedia.

UNIT-VII

NETWORK SECURITY-1: Cryptography: Substitution ciphers, Transposition ciphers, one time pads, Security services, Symmetric key Algorithms, Public key Algorithms, Digital signatures, Management of Public keys.

UNIT-VIII

NETWORK SECURITY-2:Communication Security, Authentications Protocols, E-mail Security, Web security, Social Issues, Introduction to Steganography.

TEXT BOOKS :

1. Andrew S Tanenbaum, *Computer Networks*, 4th Edition, Pearson Education 2003.
2. Behrouz A. Forouzan, *Data Communications and Networking*, 3rd Edition, TMH ,2007

REFERENCE BOOKS:

1. Michael A.Gallo, William M .Hancock *Computer Communications and Networking Technologies*, Thomson Publication.
2. Fitz Gerald, Dennis, *Business Data Communication & Networks* , 10th Edition,Wiley.
3. William Stallings, *Cryptography and Network security*, 4th Edition, Pearson Education.

MCA III Semester

10MC30103: DATA WAREHOUSING AND DATA MINING

L	T	P	C
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UNIT-I

INTRODUCTION TO DATA WAREHOUSING: Need for Data Warehousing, Operational and Informational Data Stores, Data Warehouse Definition and Characteristics.Data Warehouse Architecture: Steps for the design and construction of Data Warehouse, Three-Tier Architecture . Data Warehouse Components: Sourcing, Acquisition, cleanup and transformation tools, Metadata and Data mart.

UNIT-II

MULTIDIMENSIONAL DATA MODEL: From tables and spread sheets to data cubes , Star, Snowflake and Fact constellation Schemas for Multidimensional databases, Example for defining Star, Snowflake and Fact constellation schemas. Data Preprocessing: Data Extraction, cleanup and transformation tools. Metadata: Definition, Metadata interchange initiative, Metadata Repository and Metadata management.

UNIT-III

OLAP: Need for OLAP, OLAP Guidelines, OLAP Operations, From Data Warehousing to Data Mining. Introduction to Data Mining: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives and Major issues in Data Mining.

UNIT-IV

DATA PREPROCESSING: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, Further Development of Data Cube and OLAP Technology and Attribute-Oriented Induction.

UNIT-V

MINING FREQUENT PATTERNS, ASSOCIATIONS AND CORRELATIONS: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis and Constraint-Based Association Mining.

UNIT-VI

CLASSIFICATION AND PREDICTION: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back-propagation, Associative Classification, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor and Ensemble Methods.

UNIT-VII

CLUSTER ANALYSIS INTRODUCTION : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods. Minnig streams and Time Data: Mining Data Streams and Time-Series Data.

UNIT-VIII

MULTIMEDIA, TEXT AND WEB DATA: Multimedia Data Mining, Text Mining. Web mining: Introduction, web content mining, web structure mining, web usage mining and mining multimedia data on the web. Data Mining Applications: Financial data Analysis, Retail Industry and Telecommunication Industry.

TEXT BOOKS :

1. Jiawei Han & Micheline Kamber, *Data Mining,* 2nd Edition*,* Morgan Kaufmann Publishers, 2006.
2. Alex Berson, Stephen J. Smith, *Data Warehousing, Data Mining & OLAP,* Tata McGraw-Hill , 2004.

REFERENCE BOOKS:

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics,* 2nd Edition, Pearson Education, 2006.
2. Amitesh Sinha*, Data Warehousing,* Thomson Learning, 2007.
3. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, *Introduction to Data Mining*, Pearson Education.

4. Arun K Pujari, *Data Mining Techniques*, 2nd Edition, Universities Press, 2003.

MCA III Semester

10MC30104: SOFTWARE ENGINEERING

L	T	P	C
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UNIT-I

SOFTWARE, SOFTWARE ENGINEERING AND PROCESS: The nature of Software, The unique nature of WebApps, Software engineering- A layered technology, A Generic process model (framework), Process patterns, Process assessment and improvement, CMMI and Software myths.

UNIT-II

PROCESS MODELS: Prescriptive process models: The waterfall model, Incremental process models, Evolutionary process models. The Unified process, Agile development: Agile process and Extreme programming.

UNIT-III

SOFTWARE REQUIREMENTS: Introduction to functional and non-functional requirements, User requirements, System requirements, Interface specifications and Software requirement document. Requirements Engineering Processes: Feasibility studies, Requirements elicitation and analysis, Requirements validation.

UNIT-IV

DESIGN CONCEPTS: Software design quality guidelines and attributes, Design concepts, Design model. Architectural Design: Architecture and its importance, Architectural Styles, Architectural design and Architectural mapping using data flow.

UNIT-V

PERFORMING USER INTERFACE DESIGN: Golden rules, User Interface Analysis and Design, interface analysis, interface design steps. Pattern Based Design: Design patterns, Pattern based software design, Architectural patterns, Component level design patterns and User interface design patterns.

UNIT-VI

SOFTWARE TESTING STRATEGIES: A strategic approach to software testing, Test strategies (Unit testing and integration testing) for conventional and object oriented software, Validation testing, System testing and the art of debugging.

UNIT-VII

TESTING CONVENTIONAL APPLICATIONS: Software testing fundamentals, White-Box testing, Basis path testing: flow graph notation, independent program paths, deriving test cases, graph matrices. Control structure testing: condition testing, data flow testing, loop testing, Black box testing: Graph based testing method, Equivalence partitioning and Boundary value analysis. Testing Object Oriented Applications: OO testing methods, testing methods applicable at class level and Interclass test case design.

UNIT-VIII

RISK MANAGEMENT: Reactive versus Proactive Risk strategies, software risks, risk identification, risk projection, risk refinement, risk mitigation, monitoring and management. Maintainanace and Reengineering: Software maintenance, software supportability, reengineering, software reengineering, reverse engineering and forward engineering.

TEXT BOOK:

1. Roger S. Pressman, *Software Engineering, A practitioner's Approach*, 7th Edition, McGraw-Hill, 2010.

REFERENCE BOOKS:

1. Sommerville, *Software Engineering*, 8th Edition, Pearson education, 2007.
2. K.K. Agarwal & Yogesh Singh, *Software Engineering*, New Age International Publishers.
3. James F. Peters, Witold Pedrycz, *Software Engineering,* John Wiely.
4. Waman S Jawadekar, *Software Engineering principles and practice*, The McGraw-Hill Companies, 2006.

MCA III Semester

10MC30105: WEB APPLICATION DEVELOPMENT AND NETWORKS LAB

L	T	P	C
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Week- 1 :

1. Develop static pages of an online Book Store by only using HTML (the pages should resemble:www.amazon.com). The website should consist the following pages.
   a. Home Page b. Registration and User Login c. Books Catalog

Week-2 :

2. Design and develop a Feedback form using JavaScript.
3. Validate the Registration and User Login pages of program – 1.

Week-3 :

4. Create a web page with all types of Cascading style sheets.
5. Create and save an XML document at the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

Week- 4 :

6. Programs using XML Schema , XSLT/XSL

Week- 5:

7. Program using DOM / SAX.

Week- 6:

8. a. Write a java program to get IP Address, Host Name and Port Numbers of a Local system
   b. Write a Java Program using Datagram Communication.

Week- 7:

9. Write a basic Servlet program that must display information like
   a. Request method used by the client b. Current system date

Week- 8 :

10. Generate a Servlet, that will accept form data from HTML file which includes Name of the user and favorite programming language described in terms of a LIST, and it must display user name and language selected by a particular Client.

Week- 9 :

11. Generate a Servlet page that showing the Session ID, Creation Time, Last Accessed Time and Max Inactive Interval. Along with page should display links like Reload this page and Invalidate the Session. When we press the Reload this page link the above information should be redisplayed. If we press Invalidate the Session link the page will display one more link like create new session along with it has to display message like session invalidated.

Week- 10 :

12. Generate JSP pages to
    a. Current system date
    b. Page should include two files (either html or jsp files) by using include directive.
    c. Page should include two files (either html or jsp files) by using include action.
    d. Any mathematical table by using Scriptlet Elements (Declaration, Expression and Scriptlet tags).
    e. Page must perform forward action.

Week- 11:

13. Write a Java Program using TCP/IP Protocol.

Week- 12:

14. Write a JSP program for finding total number of visitors in a site to keep track of active users at a given instance of time, and also display the user session starting time.

Week- 13 :

15. Write a JSP program that creates a cookie on username which is send from html file and display the cookie value as a response. The cookie must be active based on the maximum active interval time.

Week- 14 :

16. Develop java program for following SQL operations using JDBC.
    a. Create b. Insert c. Update and d. Delete

Consider the following schema:
Employee (EmpName, EmpNo Primary Key, Department, Salary)

17. Generate a JSP page that will retrieve the Employee information from the database. The page should display the employee records in a tabular format.

Week- 15 :

18. Convert static web pages of program – 1 to dynamic web pages, and make necessary database connections to user registration page, login page, and books catalog page. The books catalog should be dynamically loaded from the database.

Week- 16 :

19. Write programs in Java to create three-tier applications using JSP and Databases
    - For conducting on-line examination.

- For displaying student mark list. Assume that student information is available in a Database which has been stored in a database server.

MCA III Semester

10MC30106: DATA WAREHOUSING AND DATA MINING LAB

L	T	P	C
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Week 1:

Hospital Management System:
Creation of Data Warehouse Which consists Dimension Table and Fact Table.
When you create a definition for a hierarchy, Warehouse Builder creates an identifier key for each level of the hierarchy and a unique key constraint on the lowest level (Base Level)
Design a Hospital Management system data warehouse (TARGET) consists of Dimensions Patient, Medicine, Supplier, Time. Where measures are ' NO UNITS', UNIT PRICE.
Assume the Relational database (SOURCE) table schemas as follows
TIME (day, month, year),
PATIENT (patient_name, Age, Address, etc.,)
MEDICINE (Medicine_Brand_name, Drug_name, Supplier, no_units, Uinit_Price, etc.,)
SUPPLIER :(Supplier_name, Medicine_Brand_name, Address, etc.,)
The following Dimension

The dimension object (Dimension):

_ Name
_ Attributes (Levels) , with one primary key
_ Hierarchies

One time dimension is must.

Week 2:

Creation of various Levels of Hierarchies:
If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably.
Dimension objects (dimension) consist of a set of levels and a set of hierarchies defined over those levels. The levels represent levels of aggregation. Hierarchies describe parent-child relationships among a set of levels. For example, a typical calendar dimension could contain five levels. Two hierarchies can be defined on these levels:

H1: YearL > QuarterL > MonthL > WeekL > DayL
H2: YearL > WeekL > DayL

The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth.

Week 3:
Design the Hospital Management system data warehouse using all schemas.

Week 4:
Use an ETL tool to construct a data acquisition process (mapping) to perform the transformations from one data source to another data source as follows:

- Creation of Simple mapping transformations from source database to target database
- Creation of Filter transformations

Week 5 :

- Design mapping of source and target data source with Expression transformation
- Construct Joiner Transformation for heterogeneous data sources
- Creation of Filter Transformation for various data sources
- Design mapping of source and target data source with Rank Transformation

Week 6:

- Construct Router Transformation for heterogeneous data sources
- Creation of Joiner Transformation for various data sources without source qualifier
- Design mapping of source and target data source with Aggregator Transformation

Week 7:

- Design mapping of source and target data source with sorter transformation
- Construct UNION Transformation for heterogeneous data sources
- Creation of Lookup Transformation for various data sources

Week 8: Credit Risk Assessment:

Description:

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application. **Week 9:**

The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data.

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.

Subtasks : (Turn in your answers to the following tasks)

a. List all the categorical (or nominal) attributes and the real-valued attributes seperately. (5 marks)
b. What attributes do you think might be crucial in making the credit assessement ? Come up with some simple rules in plain English using your selected attributes. (5 marks)
c. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training. (10 marks)
d. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly ? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy ? (10 marks)

Week 10:

a) Is testing on the training set as you did above a good idea ? Why orWhy not ? (10 marks)
b) One approach for solving the problem encountered in the previous question is using cross-validation ? Describe what is cross-validation briefly. Train a Decistion Tree again using cross-validation and report your results. Does your accuracy increase/decrease ? Why ? (10 marks)
c) Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss. (10 marks)

d) Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.) (10 marks)

Week 11:

a) Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifcations equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)? (10 marks)

b) Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees ? How does the complexity of a Decision Tree relate to the bias of the model ? (10 marks)

Week 12:

a) You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain ? Also, report your accuracy using the pruned model. Does your accuracy increase ? (10 marks)

b) (Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset ? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR. (10 marks)

Week 13:

Mentor lecture on Decision Trees

- Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)
- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
    - Introduction to Weka (html version) (download ppt version)
    - Download Weka
    - Weka Tutorial
    - ARFF format
    - Using Weka from command line

Week 14:

Creation of dataset in Attribute Relation File Format(.ARFF) or Comma separator values(. csv)
Creation of dataset in Performing Preprocessing using ID3 classifier, Naive Bayes Classifier,IBK classification based on cross validation and use training set text modes

Week 15:

Experiment on dataset using simple knowledge flow for normalizing dataset.

Week 16:

Simple knowledge flow for implementing and evaluating ID3 classifier based on training set and test set on gain ratio and ranker attribute selection method.

MCA IV Semester

10MC4HS01: ORGANIZATIONAL BEHAVIOR AND HUMAN RESOURCE MANAGEMENT

L	T	P	C
4	-	-	4

UNIT–I

INTRODUCTION TO MANAGEMENT: Concepts of Management and organization- Nature and Importance of Management, Functions of Management, Contributions of F.W. Taylor and Henri Fayal to the Management, Systems Approach to Management, managerial skills, Elements of Corporate Planning Process, Environmental Scanning, SWOT Analysis, Social responsibilities of Management.

UNIT-II

INTRODUCTION TO ORGANIZATIONAL BEHAVIOUR: Concept and meaning of Organizational Behaviour(OB), characteristics of OB, role of OB, approaches to the study of OB, Organizational theory, Models of OB.

UNIT-III

INDIVIDUAL DIMENSIONS OF ORGANIZATIONAL BEHAVIOUR: Concept of behaviour, Managerial implications of individual behaviour, individual differences.
PERSONALITY: concept, determinants of personality, theories of personality, Organizational applications of personality.

UNIT-IV

PERCEPTION: Process of perception, inter personal perception, managerial applications of perception. **Learning**: Components of learning process, factors affecting learning, theories of learning, cognitive learning theory, social learning theory.

UNIT-V

NATURE AND SCOPE OF HRM: Functions and objectives of HRM, evaluation of HRM, Human capital management, importance of HRM.

UNIT-VI

HR PLANNING : Nature and importance of HRP, factors affecting HRP, job analysis, nature, process of job analysis, job design, factors affecting job design, contemporary issues in job design.

UNIT-VII

RECRUITMENT AND SELECTION: Nature and importance of recruitment, recruitment process, selection process, selection as a source of compliance advantage, barriers to effective selection, induction and orientation, requisites for effective orientation programme, evaluation of orientation programme.

UNIT-VIII

TRAINING: Development and career management - Nature of training and development, gaps in training, the training process, impediments in effective training, career development. Contemporary issues in HRM, outsourcing HR activities, Business Process Outsourcing (BPO), call centers and challenges, balancing work life, managing diversity, globalization and HRM.

TEXT BOOKS:

1. L.M.Prasad, *Organizational behavior*, 4th Edition, Sultan Chand and Sons', 2006.
2. Prof. K.Aswathappa, *Human resource management, text and cases*, 5th Edition , McGraw Hill Publishing company ltd., 2009

REFERENCE BOOKS:

1. Fred Luthans, *Organizational behaviour*, 9th Edition, McGraw hill higher education, 2002.
2. Shashi K. Gupta and Rosy Joshi, *Organizational behaviour*, 4th Edition, Kalyani Publications, 2006

3. P. Subba rao, *Personnel and Human resource management*, 4th Edition, Himalaya Publishing House Pvt. Ltd., 2009.

MCA IV Semester

10MC40101: UNIX PROGRAMMING USING C++

L	T	P	C
4	-	-	4

UNIT-I

UNIX UTILITIES: Introduction to Unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin. Text processing utilities and backup utilities, detailed commands to be covered are cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT-II

PROBLEM SOLVING APPROACHES IN UNIX: Using single commands, using compound Commands, shell scripts, C programs, building own command library of programs.
WORKING WITH THE BOURNE SHELL: what is a shell, shell responsibilities, pipes and input Redirection, output redirection, here documents, the shell as a programming language, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT-III

UNIX AND ANSI STANDARDS: The ANSI C standards, the ANSI/ISO C++ Standards, difference between ANSI C and C++, the POSIX standards, the POSIX.1 FIPS Standard, the X/Open Standards.
C++ LANGUAGE REVIEW: C++ features for object oriented programming, C++ class declaration, friend functions and classes, class inheritance, virtual functions ,virtual base class, abstract class, the new and delete operators, operator overloading, template functions and classes, exception handling.

UNIT-IV

UNIX AND POSIX APIs: UNIX and POSIX APIs, the UNIX and POSIX development environment, API common characteristics.
UNIX FILES: File types, the UNIX and POSIX file systems, the UNIX and POSIX File attributes, inodes in UNIX System V, application program interface to files, UNIX kernel support files, relationship of C stream pointers and file descriptors, directory files, hard and symbolic links.

UNIT-V

UNIX FILE APIs: General file APIs, file and record locking, directory file APIs, device file APIs, general file class, regfile class for regular class, dirfile class for directory files, FIFO file class , device file class, symbolic link file class, file listing program.

UNIT-VI

UNIX PROCESSES: UNIX kernel support for processes, process APIs, process attributes, change process attributes, a minishell Example.
SIGNALS: UNIX kernel support for signals, signal, signal mask, sigaction, the SIGCHLD Signal and the waitpid API, the sigsetjmp and siglongjmp APIs, kill, alarm, Interval timers, POSIX. 1b timers, timer class.

UNIT-VII

INTERPROCESS COMMUNICATIONS: POSIX.1b IPC methods, the UNIX System V IPC methods, UNIX System V messages, POSIX.1b messages, UNIX system V semaphores, POSIX.1b semaphores, UNIX System V shared memory, memory mapped I/O, POSIX.1b shared memory.

UNIT-VIII

SOCKETS AND TLI: Sockets, a stream socket example, client/server message handling example, TLI, TLI class, client/server message example, datagram example.

TEXT BOOKS:

1. T.Chan, *Unix system programming using C++*, PHI, 2008.
2. Sumitabha Das, *Unix Concepts and Applications,* 4th Edition, TMH, 2008.

REFERENCE BOOKS:

1. W.R. Stevens, *Unix Network Programming*, Pearson Education, 2008

2. Graham Glass, King Ables, *Unix for programmers and users*, 3rd Edition, Pearson Education, 2003.
3. Kernighan and Pike, *Unix programming environment*, Pearson Education, 2006.

MCA IV Semester

10MC40102: MULTIMEDIA APPLICATION DEVELOPMENT

L	T	P	C
4	1	-	4

UNIT-I

OVERVIEW OF GRAPHICS SYSTEMS: Video-display device: raster-scan systems, random scan systems, graphics monitors and workstations, input devices, hard copy devices and Graphics software.
OUTPUT PRIMITIVES: Points and lines, line drawing algorithms, Loading the frame buffer, line function, Mid-point circle Algorithm and Ellipse Generating Algorithms.

UNIT-II

COMPUTER ANIMATION: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems and motion specifications.

UNIT-III

MULTIMEDIA AUTHORING AND DATA REPRESENTATIONS: Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation, graphics/image data types, file formats, Color in image and video: color science, color models in images and color models in video.

UNIT-IV

ACTION SCRIPT: Core Concepts, Instance Methods Revisited, Static Variables and Static Methods, Functions, Inheritance, Compiling and Running a program, Datatypes and Type Checking, Interfaces.

UNIT-V

EVENT AND EXCEPTION HANDLING: Events, Exceptions and Error Handling, Dynamic ActionScript, Scope, Events and Display Hierarchies, Interactivity.

UNIT-VI

ANIMATION TECHNIQUES: Screen Updates, Programmatic Animation, Drawing with Vectors, Bitmap Programming, Text Display and Input.

UNIT-VII

BASIC VIDEO COMPRESSION TECHNIQUES: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG and Basic Audio Compression Techniques.

UNIT-VIII

MULTIMEDIA NETWORK COMMUNICATIONS AND APPLICATIONS: Basics of Multimedia Networks, Quality of Multimedia Data Transmission, Multimedia Over IP, Multimedia Over ATM Networks, Transport of MPEG-4 and Media-On- Demand (MOD).

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker ,*Computer Graphics C version*, 2nd Edition, Pearson Education, 2006.
2. Ze-Nian Li and Mark S. Drew ,*Fundamentals of Multimedia,* Pearson Education, 2008.
3. Colin Moock ,*Essentials ActionScript 3.0*,SPD O' REILLY, 2007.

REFERENCE BOOKS:

1. Nigel chapman and jenny chapman, *Digital Multimedia*, Wiley-Dreamtech, 2005.
2. Zhigand xiang, Roy Plastock ,Schaum's outlines, *Computer Graphics*, 2nd edition, Tata Mc-Grawhill, 2010.

MCA IV Semester

10MC40103: INFORMATION SECURITY
(ELECTIVE-I)

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION: Introduction to Security, Security Attacks, Security Services and Mechanisms, A model for Internetwork security, Internet Standards and RFCs.
CLASSICAL ENCRYPTION TECHNIQUES: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques.

UNIT-II

BLOCK CIPHERS AND THE DATA ENCRYPTION STANDARD: Block Cipher Principles, The Data Encryption Standard (DES), The Strength of DES, Triple DES.
ADVANCED ENCRYPTION STANDARD (AES): AES Cipher, Block Cipher Modes of Operation, Stream Ciphers and RC4, Placement of Encryption Function, Key Distribution.

UNIT-III

PUBLIC-KEY ENCRYPTION AND MESSAGE AUTHENTICATION: Principles of Public-Key Cryptosystems, Public-Key Cryptography algorithms (RSA, Diffie – Hellman Key Exchange), Message Authentication and Hash Functions – Authentication Requirements, Authentication Functions, Message Authentication Codes.

UNIT-IV

HASH FUNCTIONS: Hash Functions, Secure Hash Algorithm, HMAC, Digital Signatures, Key Management, Kerberos, X.509 Authentication Service.

UNIT-V

ELECTRONIC MAIL SECURITY: Pretty Good Privacy(PGP) and S/MIME.

UNIT-VI

IP SECURITY: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT-VII

WEB SECURITY: Web Security Considerations, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT-VIII

SYSTEM SECURITY: Intruders, Intrusion Detection Systems, Viruses and Related Threats, Virus Countermeasures, Firewall Design Principles, Trusted Systems.

TEXT BOOK:

1. William Stallings*, Cryptography and Network Security*, 4th Edition, Pearson Education, 2009.

REFERENCE BOOKS:

1. William Stallings, *Network Security Essentials (Applications and Standards)*, 3rd Edition, Pearson Education, 2009.
2. Atul Kahate, Keith Strassberg, *Cryptography and Network Security,* 2nd Edition, TMH, 2008.
3. Michael E.Whitman, Herbert J. Mattord, *Principles of Information Security*, Cengage Learning, 2008.
4. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World*, 2nd Edition, Pearson Education, 2005.
5. Robert Bragg, Mark Rhodes, Ousley, *Network Security: The Complete Reference*, TMH, 2009.

MCA IV Semester

10MC40104: INFORMATION RETRIEVAL SYSTEMS
(ELECTIVE-I)

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

UNIT-II

INFORMATION RETRIEVAL SYSTEM CAPABILITIES: Search Capabilities, Browse Capabilities, Miscellaneous Capabilities.

UNIT-III

CATALOGING AND INDEXING: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

UNIT-IV

DATA STRUCTURE: Introduction, Stemming Algorithms, Inverted file Structure, N-Gram Data Structures, PAT Data Structure, Signature File Structure, Hypertext Data Structure.

UNIT-V

AUTOMATIC INDEXING: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages.

UNIT-VI

DOCUMENT AND TERM CLUSTERING: Introduction, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.

UNIT-VII

USER SEARCH TECHNIQUES: Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean Systems, Searching the Internet and Hypertext. **INFORMATION VISUALIZATION**: Introduction, Cognition and Perception, Information Visualization Technologies.

UNIT-VIII

TEXT SEARCH ALGORITHMS: Introduction, Software Text Search Algorithms, Hardware Text Search Systems.
INFORMATION SYSTEM EVALUATION: Introduction, Measures Used in System Evaluations, Measurement Example – TREC Results.

TEXT BOOK:

1. Gerald J. Kowalski, Mark T. Maybury, *Information Storage and Retrieval Systems,* 2nd Edition, Springer International Edition, 2009.

REFERENCE BOOKS:

1. William.B.Frakes, Ricardo Baeza - Yates, *Information Retrieval Data Structures and Algorithms*, 1st Edition, Prentice Hall, 1992.
2. Ricardo Baeza – Yates, Berthier Ribeiro-Neto, *Modern Information Retrieval,* 1st Edition, Pearson Education, 2004.
3. Robert R. Korfhage, *Information Storage and Retrieval*, John Wiley and Sons, 1997.

MCA IV Semester

10MC40105: BUSINESS INTELLIGENCE
(ELECTIVE-I)

L	T	P	C
4	-	-	4

UNIT-I

BUSINESS INTELLIGENCE AND INFORMATION EXPLOITATION: Why Business Intelligence (BI), Information Asset, BI and Program Success, What is BI. **THE VALUE OF BI**: Information Asset and Data Valuation, BI Applications, Intelligence Dashboards, BI Ads Value. **PLANNING FOR SUCCESS**: BI Success Factors, Team Building, Strategic versus Tactical Planning.

UNIT-II

THE BI ENVIRONMENT: BI Process, System Infrastructure, Information Access, Delivery and Analysis, Services and Management Issues.**BUSINESS MODELS AND INFORMATION FLOW:** Information Processing and Information Flow, Information Flow Model and Modeling Frameworks.

UNIT-III

BUSINESS RULES: The Business rules approach, Business rule, Business Rule System and Sources of Business Rules. **DATA PROFILING:** Activities, Data Model Inference, Attribute Analysis and Relationship Analysis.
DATA QUALITY AND INFORMATION COMPLIANCE: Types of Errors, Data Cleaning, Business Rule-Based Information Compliance.

UNIT-IV

INFORMATION INTEGRATION: ETL (Extraction, Transformation and Loading), Enterprise Application Integration and Web Services, Record Linkage and Consolidation. **THE VALUE OF PARALLELISM:** Parallelism and Granularity, Parallel Processing Systems, Dependence, Parallelism and BI.

UNIT-V

ALTERNATE INFORMATION CONTEXTS: Psychographics and Demographics, Geographic Data, Web Behavior Intelligence. **DATA ENHANCEMENT:** Types of Data Enhancement, Incremental Enhancements, Batch Enhancements, Standardization and Enhancement Methodologies.

UNIT-VI

DATA VISUALIZATION: Data Visualization, Real time Business Intelligence, Automated Decision Support and Competitive intelligence.

UNIT-VII

INTELLIGENT SYSTEMS: Artificial Intelligence and Expert Systems: Concepts and Definitions of Artificial Intelligence, Artificial Intelligence Fields, Basic Concepts of Expert Systems, Applications and Structure of Expert Systems.

UNIT-VIII

ADVANCE INTELLIGENT SYSTEMS: Machine Learning Techniques, Case Based Reasoning (CBR), Genetic Algorithm Fundamentals and Natural Language Processing(NLP).

TEXT BOOKS:

1. David Loshin*, Business Intelligence,* Morgan Kaufmann Publishers, 2003.
2. Efraim Turban, Jay E.Aronson, Teng-Peng Liang, Ramesh Sharda, *Decision Support and Business Intelligence Systems*, 8th Edition, Pearson Education, 2009.

REFERENCE BOOKS:

1. Mike Biere, *Business Intelligence for the Enterprise*, Pearson Education, 2003.
2. Cindi Howson, *Successful Business Intelligence Secrets to making BI a Killer App.,* McGraw Hill, 2007.

MCA IV Semester

10MC40106: COMPUTER VISION
(ELECTIVE-I)

L	T	P	C
4	-	-	4

UNIT-I

CAMERAS: Pinhole Cameras, Camera with Lenses, the Human Eye and Sensing.
RADIOMETRY-MEASURING LIGHT: Light in Space, Light at Surfaces and Important Special Cases.

UNIT-II

SOURCES, SHADOWS AND SHADING: Qualitative Radiometry, Sources and their effects, Local Shading Models, Application: Photometric Stereo, Inter reflections: Global Shading Models.

UNIT-III

LINEAR FILTERS: Linear Filters and Convolution, Shift Invariant Linear Systems, Spatial Frequency and Fourier Transforms, Sampling and Aliasing, Filters as Templates, Technique: Normalized Correlation and Finding Patterns, Scale and Image Pyramids.

UNIT-IV

EDGE DETECTION: Noise, Estimating Derivatives, Detecting Edges. Texture: Representing Texture, Analysis using Oriented Pyramids . Application: Synthesizing Textures for Rendering, Shape for Texture for Planes.

UNIT-V

SEGMENTATION BY CLUSTERING: What is Segmentation, Human Vision: Grouping and Gestalt, Applications: Shot Boundary Detection and Background Subtraction, Image Segmentation by Clustering Pixels, Segmentation by Graph-Theoretic Clustering.

UNIT-VI

SEGMENTATION BY FITTING A MODEL: The Hough Transform, Fitting Lines, Fitting Curves, Fitting as Probabilistic Inference Problem, Robustness, Example: Using RANSAC to Fit Fundamental Matrices, Missing Data Problems, the EM Algorithm.

UNIT-VII

FINDING TEMPLATES USING CLASSIFIERS: Method for Building Classifiers, Building Classifiers from Class Histograms, Feature Selection, Neural Networks, the Support Vector Machine.

UNIT-VIII

RECOGNIZATION BY RELATIONS BETWEEN TEMPLATES: Finding Objects by Voting on Relations between Templates, Relational Reasoning Using Probabilistic Models and Search, Using Classifiers to Prune Search, Hidden Markov Models, Application: HMM and Sign Language Understanding, Finding People with HMM.

TEXT BOOK:

1. David A. Forsyth, Jean Ponce, *Computer Vision-A Modern Approach*, PHI, 2003.

REFERENCE BOOKS:

1. Sommer, *Geometric Computing with Clifford Algebra,* 1st Edition, Springer ,2001.
2. Sonka, *Digital Image Processing and Computer Vision*, 1st Edition, Ceneage Learning India Pvt Ltd, 2008.
3. Jack, *Computer Vision and Applications*: Concise Edition, Academy Press, 2000.

MCA IV Semester

10MC40107: ADVANCED DATABASE MANAGEMENT SYSTEMS
(ELECTIVE-II)

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION: Overview of Relational Database.

THE RELATIONAL ALGEBRA AND RELATIONAL CALCULUS: Unary Relational Operations–SELECT and PROJECT, Relational Algebra Operations from Set Theory, Binary Relational Operations-JOIN and DIVISION, Additional Relational Operations, The Tuple Relational Calculus, The Domain Relational Calculus.

UNIT-II

OBJECT AND OBJECT-RELATIONAL DATABASES: Concepts for Object Databases: Overview of object oriented concepts, Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type and Class Hierarchies and Inheritance, Complex Objects.

OBJECT DATABASE STANDARDS, LANGUAGES AND DESIGN: Object Model Of ODMG, the Object Definition Language ODL, the Object Query Language OQL, Object Database Conceptual Design .

UNIT-III

OBJECT-RELATIONAL AND EXTENDED-RELATIONAL SYSTEMS: SQL and Its Object-Relational Features, Evolution and Current Trends of Database Technology, The Informix Universal Server, Object-Relational Features of Oracle, Implementation and Related Issues for Extended Type Systems, The Nested Relational Model.

DATABASE SECURITY AND AUTHORIZATION: Security Issues, Discretionary Access Control Based on Granting and Revoking Privileges, Mandatory Access Control and Role-Based Access Control for Multilevel Security.

UNIT-IV

SECURITY, ADVANCED MODELING AND DISTRIBUTION: Introduction to Statistical Database Security, Flow Control, Encryption and Public Key Infrastructures, Privacy Issues and Preservation.

ENHANCED DATA MODELS FOR ADVANCED APPLICATIONS: Active Database Concepts and Triggers, Temporal Database Concepts, Spatial and Multimedia Databases.

UNIT-V

DISTRIBUTED DATABASES: Introduction, Distributed DBMS Architecture, Architectural Models for Distributed DBMSs.

DISTRIBUTED DATABASE DESIGN: Design Strategies, Distribution design issues, Fragmentation, Allocation.

UNIT-VI

QUERY PROCESSING IN DISTRIBUTED DATABASES: Objectives, Characterization of Query processors, Layers of Query processing.

OPTIMIZATION OF DISTRIBUTED QUERIES: Query optimization, centralized query optimization, join ordering in fragment queries, Distributed Query optimization algorithms.

UNIT-VII

INTRODUCTION TO TRANSACTION MANAGEMENT: Definition of transaction, Properties of transactions, Types of transactions.

DISTRIBUTED CONCURRENCY CONTROL : Serializability, Taxonomy of concurrency control mechanisms, locking based concurrency control algorithms, Timestamp based concurrency control algorithms, optimistic concurrency control algorithms, deadlock management, RELAXED concurrency control.

UNIT-VIII

EMERGING TECHNOLOGIES – XML AND INTERNET DATABASES: Structured, Semi structured, and Unstructured Data, XML Hierarchical (Tree) Data Model, XML Documents, DTD, and XML Schema, XML Documents and Databases, Mobile Databases, Geographic Information Systems.

TEXT BOOKS:

1. R. Elmasri and S.B.Navathe *, Fundamentals of Database Systems*, 5th Edition, Pearson education , 2009.
2. M.Tamer Ozsu and Patrick Valduriez, *Principles of Distributed Database Systems*, 2nd Edition, Pearson education, 2008 .

REFERENCE BOOKS:

1. Raghu Ramakrishna and Johannes Gehrke *, Database Management systems*, 3rd Edition, McGraw Hill, 2003.
2. Stefano Ceri and Gluseppe Pelagatti, *Distributed databases*, McGraw Hill.
3. C.J.Date, Addison Wilsey *, Database Systems* ,7th Edition, 2003.

4. Peter Rob and Caros Coronel *, Database Systems* , 5th Edition, Thomson, 2008.

MCA IV Semester

10MC40108: SOFTWARE PROJECT MANAGEMENT
(ELECTIVE –II)

L	T	P	C
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UNIT-I

CONVENTIONAL SOFTWARE MANAGEMENT: The waterfall model, conventional software Management performance. **EVOLUTION OF SOFTWARE ECONOMICS** : Software Economics, pragmatic software cost estimation.

UNIT-II

IMPROVING SOFTWARE ECONOMICS : Reducing Software product size, improving software processes, improving team effectiveness, improving automation through software environments, achieving required quality, Peer inspections: A Pragmatic view.**THE OLD WAY AND THE NEW** : The principles of conventional software engineering, principles of modern software management, transitioning to an iterative process.

UNIT-III

LIFE CYCLE PHASES : Engineering and production stages, inception phase, elaboration phase, construction phase and transition phase.

ARTIFACTS OF THE PROCESS : The artifact sets, management artifacts, engineering artifacts and pragmatic artifacts.

UNIT-IV

MODEL BASED SOFTWARE ARCHITECTURES : A Management perspective and technical perspective. **WORK FLOWS OF THE PROCESS** : Software process workflows and Iteration workflows.

UNIT-V

CHECKPOINTS OF THE PROCESS : Major mile stones, Minor Milestones and Periodic status assessments. **ITERATIVE PROCESS PLANNING** : Work breakdown structures, planning guidelines, cost and schedule estimating process, iteration planning process and pragmatic planning.

UNIT-VI

PROJECT ORGANIZATIONS AND RESPONSIBILITIES : Line-of- business organizations, project organizations and evolution of organizations. **PROCESS AUTOMATION** : Tools: automation building blocks, The Project Environment: Roundtrip Engineering, Change management, Infrastructures and Stakeholder Environments

UNIT-VII

PROJECT CONTROL AND PROCESS INSTRUMENTATION: The seven core Metrics, Management indicators, Quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.
TAILORING THE PROCESS: Process discriminants.

UNIT-VIII

FUTURE SOFTWARE PROJECT MANAGEMENT: Modern Project Profiles, Next generation Software economics, modern process transitions.

CASE STUDY: The Command Center Processing and Display System- Replacement (CCPDS-R).

TEXT BOOK:

1. Walker Royce, *Software Project Management*, 6th Edition, Pearson Education, 2007.

REFERENCE BOOKS:

1. Bob Hughes and Mike Cotterell, *Software Project Management*, 4th Edition, Tata McGraw-Hill, 2006.
2. Joel Henry, *Software Project Management*, Pearson Education, 2004.
3. Pankaj Jalote, *Software Project Management in practice*, Pearson Education.

MCA IV Semester

10MC40109: DESIGN AND ANALYSIS OF ALGORITHMS (ELECTIVE-II)

L	T	P	C
4	-	-	4

UNIT–I

OVERVIEW OF DATA STRUCTURES: Review of Arrays, Stacks, Queues, linked lists, Linked stacks and Linked queues, Applications.

UNIT–II

ALGORITHM ANALYSIS: Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using Big O notation, Polynomial Vs Exponential Algorithms, Average, Best and Worst Case Complexities, Analyzing Recursive Programs.

UNIT–III

TREES AND GRAPHS: Introduction, Definition and Basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs-basic concepts, representation and traversals.

UNIT–IV

BINARY SEARCH TREES, AVL TREES AND B-TREES: Introduction, Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B-Trees: Definition, Operations and applications.

UNIT–V

RED – BLACK TREES, SPLAY TREES AND HASH TABLES: Red – Black Trees, Splay Trees and its applications. Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

UNIT–VI

DIVIDE-CONQUER AND GREEDY METHOD: General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication, Greedy Method**:** General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT–VII

DYNAMIC PROGRAMMING: General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

UNIT–VIII

BACK TRACKING AND BRANCH-BOUND: General Method, 8 – Queen's Problem, Graph Coloring. Branch and Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

TEXT BOOKS:

1. G.A.V. Pai, *Data Structures and Algorithms*, Tata Macgraw Hill, 2009.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, *Fundamentals of Computer Algorithms*, 2nd Edition, University Press.

REFERENCE BOOKS:

1. D. Samanta, *Classical Data Structures*, PHI, 2005.
2. Aho, Hopcraft, Ullman, *Design and Analysis of Computer Algorithms*, PEA, 1998.
3. Goodman, Hedetniemi, *Introduction to the Design and Analysis of Algorithms*, TMG.
4. E. Horowitz, S. Sahani, Galgotia, *Design and Analysis of Algorithms*, 3rd Edition.

5. A.Levitin, *Introduction to the Design and Analysis of Algorithms*, Pearson Education, 2005.

MCA IV Semester

10MC40110: SOFTWARE ARCHITECTURE
(ELECTIVE-II)

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION TO SOFTWARE ARCHITECTURE: An Engineering Discipline for Software, Status of S/W Arch, Architecture Business Cycle, Where do Architectures come from, Software Processes and the Architecture Business Cycle, Features of Good Architecture.

UNIT-II

ARCHITECTURE STYLES: Pipes and Filters, Data Abstraction and Object Oriented organization, Event-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

UNIT-III

SHARED INFORMATION SYSTEMS: Database Integration, Interpretation in Software Development Environments, Architectural Structures for Shared Information Systems.

UNIT-IV

ARCHITECTURAL DESIGN GUIDANCE: Guidance for User Interface Architectures, Case Study in Inter Operability: World Wide Web.

UNIT-V

PATTERN TYPES: Architectural Patterns, Structural Patterns, Patterns for Distribution, Patterns for Interactive Systems

UNIT-VI

FORMAL MODELS AND SPECIFICATIONS: Finalizing the Architectural of a Specific System, Architectural Style, Architectural Design Space, case Study of an Industry Standard Computing. Infrastructure: CORBA

UNIT-VII

ARCHITECTURAL DESCRIPTION LANGUAGES: ADL's today, capturing Architectural Information in an ADL, Application of ADL's in systemDevelopment, Choosing an ADL, Example of ADL.

UNIT-VIII

REUSING ARCHITECTURAL ASSETS WITHIN AN ORGANIZATION: Creating Products and Evaluating a Product Line, Organizational Implications of a Product Line, Component Based Systems. Software Architecture in Legacy Systems.

TEXT BOOKS:

1. Mary Shaw, David Garlan, *Software Architecture*, PHI, 1996.
2. Len Bass, Paul Elements, Rick Kazman, *Software Architecture in Practice*, PEA, 1998.

REFERENCE BOOKS:

1. Garmus, Herros, *Measuring the Software Process: A Practical Guide to Functional Measure,* PHI, 1996.
2. W.Humphery, *Introduction to Team Software Process*, PEA, 2002.
3. Buschmann, *Pattern Oriented Software Architecture*, Wiley, 1996.
4. Gamma et al, *Design Patterns*, PEA, 1995.
5. Shaw, gamma, *Software Architecture*, PHI, 1996.

MCA IV Semester

10MC40111: UNIX PROGRAMMING USING C++ LAB

L	T	P	C
-	-	3	2

Week1:
a) File handling utilities.
b) Text processing utilities and backup utilities

Week2:
a) Process utilities and disk utilities.
b) networking commands

Week3:
a) Write a shell script that copies multiple files to a directory.
b) Write a shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns reminder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add (-a), subtract (-s), multiply (-m), quotient (-c) and reminder (-r).

Week4:
a) Write a shell script that counts the number of lines and words present in a given file.
b) Write a shell script that displays the list of all files in the given directory

Week5:
a) Write a shell script to generate a multiplication table.
b) Write a shell script to reverse the rows and columns of a matrix.

Week6:
a) Write a C program that counts the number of blanks in a text fileUsing standard I/O and System calls.
b) Implement in C the following Unix commands using system calls.
    a) cat b)ls c) mv

Week7:
Write a program that takes one or more file/directory names as command line
Input and reports the following information on the file:
    a) File type.
    b) Number of links.
    c) Time of last access.
    d) Read, Write and Execute permissions

Week8:
a) Write a C++ program that illustrates uses of the mkdir, opendir, readdir, closedir, and rmdir APIs.
b) Write a C++ program that illustrates how to execute two commands concurrently with a command pipe

Week10:
a) Write a C++ program that illustrates the creation of child process using fork system call.
b) Write a C++ program that displays the real time of a day every 60 seconds.

Week11:
a) Write a C++ program that illustrates file-locking using semaphores.
b) Write a C++ program that implements a producer-consumer system with two processes. (Using semaphores)

Week12:
Write a C++ program that illustrates inter process communication using shared memory system calls.

Week13:
Write a C++ program that illustrates the following
    a) Creating a message queue.
    b) Writing to a message queue.
    c) Reading from a message queue.

Week14:
Write a C++ program to develop simple client and server application using sockets (Connection less).

Week15:
Write a C++ program to develop simple client and server application using sockets (Connection Oriented).

MCA IV Semester

10MC40112: MULTIMEDIA APPLICATION DEVELOPMENT LAB

L	T	P	C
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Week 1:

1. Draw a rectangle, and apply the following animation techniques.
   i. Motion Tween.
   ii. Rotation.
   iii. Shrink and Grow.
   iv. Shape Tween.
   v. Add Guide Layer.

Week 2:

2. Create action sequence of animation.
   Ex: Moving and jumping of a stick man
3. Animate a Flash movie that shows the truck moving behind the trees.

Week 3:

4. Animate a Flash movie that shows the Flag hoisting.
5. Animate a Flash movie that shows Cannon blast. Use motion tween to cannon up into a firing position and then apply shape tween to flame explosion. Add guide layer to move the flame in a specified path from cannon barrel' s to the destination.
6. Create solar system by using guide layer.

Week 4:

7. Animate a Flash movie that shows the Spotlight Masking. Use text as a masked object and circle as a mask object.
8. Create, following Flash Symbols.
   a. Movie Clip. b. Button.
9. Animate a Flash movie that shows flying a butterfly. Create a movie clip symbol of a moving wing and then add two instances of that symbol to the butterfly. Apply motion tween to the Butterfly across the garden.

Week 5:

10. Create a Flash movie that enables the user to click left and right arrow buttons to view the images of the Movie Clip in left and right directions respectively. Initially you add a set of images to the Movie Clip and then view the images of the Movie Clip through the buttons. Add necessary Action Script code to buttons.

Note: left and right arrow buttons should be created by the user.

Week 6:

11. Create a Flash movie that accepts User Id and Password from the user. Validate User Id and Password fields whenever the user presses the submit button and then display appropriate message to the user. Store different user's user id and password details into an array object. The movie will not allow the user to continue the playing unless he or she entered something into the user id and password fields.

Week 7:

12. Create a Flash movie that shows the Movie Clip and allow the user to control the movement of the movie clip through the keyboard. Once the user presses the Left, Up, Right and Down arrow keys from the keyboard, the movie clip will move in Left, Upward, Right and Downward directions respectively. You should move the movie clip in a specified boundaries of the left, top, right and bottom corners of the stage.

Note: Assume any geometric shape as a Movie Clip.

Week 8:

13. Write an Action Script application to sort 'N' number of integer Array elements.

Week 9:

14. Write an Action Script application to display the Movie Clip's randomly.
15. Create a Flash movie that shows a Digital Clock.

Week 10:

16. Write an Action Script application to an Indian Currency Converter.

Week 11:

17. Write an Action Script application to design the User Registration form.

Week 12:

18. Create a Flash movie that shows a Digital Clock.

Week 13:

19. Create Traffic animation.(Traffic controlled by the signals)

Week 14:

20. Create a Flash movie that shows an Analog clock.

MCA IV Semester

10MC4HS02: ADVANCED COMMUNICATION SKILLS
(AUDIT COURSE)

L	T	P	C
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UNIT-I

GROUP DISCUSSION: Characteristics of a successful GD – Leadership qualities in a GD – Intervention – Relevance – Fluency – Modulation of Voice – Summarizing.

UNIT-II

RESUME WRITING: Career Correspondence – Structure and Presentation – Types – Career Objective.

UNIT-III

INTERVIEW SKILLS: Preparation – Strategy to Succeed in Interviews – Mock Interviews.

UNIT-IV

PERSONALITY DEVELOPMENT: Attitude – Behavior – Motivation – Self-esteem and Self- confidence – Interpersonal Skills – Principles of success.

UNIT-V

TEAM BUILDING: Leadership Skills – Group dynamics – Negotiations – Decision making.

UNIT-VI

BUSINESS CORRESPONDENCE: Letters – Note-making – Note-taking – Report analysis – Work place correspondence.

UNIT-VII

PROFESSIONAL ETIQUETTE : SMS – E mail – Chat/Voice mail – Cell phone – Teleconference – Behavior – Business and Manners – Dining – Office – Introduction – Rules of the handshake – Creating Positive Impression – Social Cognition – Theatre – Appointment

UNIT-VIII

PROFESSIONAL ETHICS : Morals – Values and Ethics – Integrity – Caring – Sharing – Honesty – Courage – Co-operation – Commitment – Courtesy – Empathy – Self-Confidence – Character – Professionalism – Egos – Loyalty – Responsibility – Confidentiality – Leadership – Emotional Competency

REFERENCE BOOKS:

1. M. Ashraf Rizvi, *Effective Technical Communication Skills*. , Tata McGraw Hill, New Delhi, 2005.
2. Meenakshi Raman and Sangetha Sharma, *Technical Communication, Principles and Practice,* Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, *Secrets of Success in Interviews*, Crucial Books, Secunderabad, 2007.
4. Rajendarpal and J.S Korla Halli, *Essentials of Business Communication*, Sultan Chand Books, New Delhi, 2010
5. M. Ashraf Rizvi, *Resumes and Interviews – The Art of Wining*, Tata Mc Graw Hill, New Delhi,2008.
6. Mike Martin and Roland Schinzinger, *Ethics in Engineering*, McGraw-Hill, New York, 2005.
7. John R. Boatright, *Ethics and the Conduct of Business*, Pearson Education, New Delhi, 2003.
8. Gopala Swamy Ramesh and Mahadevan Ramesh, *The Ace of Soft Skills: Attitude, Communication and Etiquette for Success*, Pearson Education, New Delhi, 2009.

MCA V Semester

10MC50101: OBJECT ORIENTED ANALYSIS AND DESIGN

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION TO UML: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, generosity, Importance of modeling, principles of modeling, object oriented modeling, An overview of UML, conceptual model of UML, Architecture and Software Development Life Cycle.

UNIT-II

BASIC STRUCTURAL MODELING: **Classes**-Terms and concepts, Common modeling techniques, **Relationships**: modeling simple dependencies, single Inheritance and structural relationships, common mechanisms and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages and Instances.

UNIT-III

CLASS AND OBJECT DIAGRAMS: Terms, concepts, modeling techniques for Class Diagram: modeling Simple collaboration, Logical database Schema, Forward and Reverse Engineering. Object Diagrams**:** Modeling object structures, Forward and Reverse engineering.

UNIT-IV

BASIC BEHAVIORAL MODELING-I: Collaboration Diagrams: Terms, Concepts, depicting a message, polymorphism in collaboration diagrams, iterated messages, use of self in messages **.** Interactions: Terms and concepts, modeling a flow of control.

Interaction diagrams: terms and concepts, modeling flows of control by time ordering and control by organization, Forward and reverse Engineering .

UNIT-V

BASIC BEHAVIORAL MODELING-II: **Use Cases**:terms and concepts, modeling the behavior of the element.

Use Case Diagrams: Terms and concepts, modeling the context of a system and requirement of a system, forward and reverse engineering.

Activity Diagrams: Terms and concepts, modeling a workflow and an operation, forward and reverse engineering.

UNIT-VI

ADVANCED BEHAVIORAL MODELING: Events and signals, processes and Threads, time and space, state chart diagrams. Architectural Modeling: Component, Deployment, Component diagrams, Deployment diagrams.

Case Studies: Library Management System and Automatic Teller Machine(ATM).

UNIT-VII

INTRODUCTION TO DESIGN PATTERNS: Design Pattern Definition, Design Patterns in Small Talk MVC, Describing Design Patterns, Catalog of Design Patterns, Organizing the Catalog, Solving of Design Problems using Design Patterns, Selection of a Design Pattern, use of Design Patterns.

UNIT-VIII

DESIGNING A DOCUMENT EDITOR (A CASE STUDY): Design problems, Document structure, Formatting, Embellishing the User Interface, Supporting Multiple Look and Feel standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

TEXT BOOKS:

1. Grady Booch, James Rum Baugh, Ivar Jacobson, *The Unified Modeling Language User Guide*, 2nd Edition, Pearson Education, 2004.
2. Gamma, Helm, Johnson, Vlissides, *Design Patterns*, PEA, 1995.

REFERENCE BOOKS:

1. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit,* WILEY- Dreamtech India Pvt. Ltd.
2. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML*, Pearson Education.
3. Pascal Roques, *Modeling Software Systems Using UML2,* WILEY-Dreamtech India Pvt. Ltd.
4. Craig Larman, *Applying UML and Patterns*, Pearson Education.

5. John W. Satzinger, Robert B Jackson and Stephen D Burd, *Object-Oriented Analysis and Design with the Unified Process*, Cengage Learning.

MCA V Semester

10MC50102: MANAGEMENT INFORMATION SYSTEM

L	T	P	C
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UNIT-I

THE MEANING AND ROLE OF MIS: What is MIS?, Systems approach, The systems view of business, MIS organization within the company.
MANAGEMENT ORGANIZATIONAL THEORY AND THE SYSTEMS APPROACH-I: Development of organizational theory.

UNIT-II

MANAGEMENT ORGANIZATIONAL THEORY AND THE SYSTEMS APPROACH-II: Development of organizational theory, Management and organizational behavior, Management, Information, and the Systems approach.

UNIT-III

INFORMATION SYSTEMS FOR DECISION MAKING: Evolution of an information system, Basic information systems, decision making and MIS, MIS as a technique for making programmed decisions, decision-assisting information systems.

UNIT-IV

STRATEGIC AND PROJECT PLANNING FOR MIS: General business planning, appropriate MIS response, MIS planning: General, detail.

UNIT-V

CONCEPTUAL SYSTEM DESIGN: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report.
UNIT-VI

DETAILED SYSTEM DESIGN : Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade-off criteria, define the subsystems, sketch the detailed operating subsystems and information flows, determine the degree of automation of each operation, document the detailed design, revisit the manager-user.
UNIT-VII
IMPLEMENTATION, EVALUATION AND MAINTENANCE OF THE MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files, test the system, cutover, document the system, evaluate the MIS, control and maintain the system.

UNIT-VIII

PITFALLS IN MIS DEVELOPMENT: Fundamental weaknesses, soft spots in planning, design problems, implementation: the TAR PIT.

TEXT BOOK:

1. R.G Murdick, J.E Ross and J. R claggett, *Information systems for Modern Management*, 3rd Edition, PHI, 2006.

REFERENCE BOOKS:

1. Laudon & Laudon, V. M. Prasad, *Management Information Systems*, 9th Edition, Pearson, 2005
2. Robert Schultheis, Mary Sumner, *Management information Systems*, 4th edition, PHI, 2004

MCA V Semester

10MC50103: MIDDLEWARE TECHNOLOGIES

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION TO CLIENT SERVER COMPUTING: Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

UNIT-II

CORBA WITH JAVA: Review of Java concept like RMI, RMI API, and JDBC.Client/Server CORBA-style, The object web: CORBA with Java.

UNIT-III

INTRODUCING C# AND THE .NET PLATFORM: Understanding .NET Assemblies, Object –Oriented Programming with C#, Callback Interfaces, Delegates, and Events.

UNIT-IV

BUILDING C# APPLICATIONS: Type Reflection, Late Binding, and Attribute-Based Programming, Object Serialization and the .NET Remoting Layer, Data Access with ADO.NET, XML Web Services.

UNIT-V

CORE CORBA / JAVA: Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multi count.

UNIT-VI

EXISTENTIAL CORBA: CORBA initialization protocol, CORBA activation services, CORBAIDL mapping CORBA java- to- IDL mapping, the introspective CORBA/Java object.

UNIT-VII

JAVA BEAN COMPONENT MODEL: Events, properties, persistency, Introspection of beans, CORBA Beans.

UNIT-VIII

EJBS AND CORBA: Object transaction monitors CORBA OTM's, EJB and CORBA OTM's, EJB container frame work, Session and Entity Beans, The EJB client/server development Process The EJB container protocol, support for transaction EJB packaging EJB design Guidelines.

TEXT BOOKS:

1. Robert Orfali and Dan Harkey, *Client/Server programming with Java and CORBA,* 2nd Edition, John Wiley & Sons, SPD, 2007.
2. G.Brose, A Vogel and K.Duddy, *Java programming with CORBA*, 3rd Edition, Wiley-Dreamtech, India John wiley and sons, 2007.
3. Andrew Troelsen, *C# and the .NET Platform,* 2nd Edition, Apress Wiley-dreamtech, India Pvt Ltd, 2005.

REFERENCE BOOKS:

1. M.L.Liu, Distributed Computing, Principles and applications, 1st Edition, Pearson Education, 2004.
2. Robert Orfali Dan Harkey and Jeri Edwards, Client/Server Survival Guide, 3rd Edition, John Wiley & Sons, 2007.
3. D T Dewire, Client/Server Computing, 1st Edition, TMH, 2003.
4. Jesse Liberty, *Programming C#*, 4th Edition, SPD-O'Reilly, 2005.

MCA V Semester

10MC50104: E-COMMERCE
(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT-I

ELECTRONIC COMMERCE: Electronic Commerce Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce Organization Applications.

UNIT-II

ELECTRONIC COMMERCE AND WORLD WIDE WEB: Architectural Framework for E-Commerce, WWW as the Architecture, Technology behind the Web, Security and the Web.

UNIT-III

CONSUMER ORIENTED ELECTRONIC COMMERCE: Mercantile Process models, Mercantile Models from Consumer's Perspective, Mercantile Models from Merchant's Perceptive.

UNIT-IV

ELECTRONIC PAYMENT SYSTEMS: Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems, Designing Electronic payment System.

UNIT-V

INTERORGANIZATIONAL COMMERCE AND ELECTRONIC DATA INTERCHANGE (EDI): EDI, EDI Applications in Business, EDI: Legal, Security and Privacy Issues, EDI and Electronic Commerce.
INTRAORGANIZATIONAL ELECTRONIC COMMERCE: Work Flow Automation and Coordination, Supply Chain Management.

UNIT-VI

CORPORATE DIGITAL LIBRARY: Document Library, digital Document types, corporate Data Warehouses.
ADVERTISING AND MARKETING: Information based marketing, Advertising on Internet, On-line marketing process and market research.

UNIT-VII
CONSUMER SEARCH AND RESOURCE DISCOVERY: Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT-VIII

MULTIMEDIA AND DIGITAL VIDEO: Key Multimedia concepts, Digital Video and electronic Commerce, Desktop video conferencing.

TEXT BOOK:

1. Ravi Kalakota, Andrew B. Whinston, *Frontiers of electronic commerce,* Pearson Education, 2008.

REFERENCE BOOKS:

1. Marilyn Greenstein and Todd M Feinman, *Electronic Commerce,* Tata McGraw-Hill, 2000.
2. Brenda Kienan, *Managing E-Commerce Business,* PHI, 2001.
3. Vivek Sharma and Rajiv Sharma, *Developing E-Commerce Sites*, Pearson Education Asia, 2000.

MCA V Semester

10MC50105:MOBILE COMPUTING
(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION TO NETWORK TECHNOLOGIES AND CELLULAR COMMUNICATIONS: HIPERLAN**:** Protocol architecture, physical layer, Channel access control sub-layer, MAC sub-layer, Information bases and networking. **WLAN:** Infrared vs. radio transmission, Infrastructure and ad hoc networks, IEEE. **802.11. Bluetooth.** User scenarios, Physical layer, MAC layer, Networking, Security, Link management. **GSM:** Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT-II

MOBILE COMPUTING (MC): Introduction to MC, novel applications, limitations, and architecture, SDMA, FDMA, TDMA, CDMA.

UNIT-III

MOBILE NETWORK LAYER: Mobile IP :Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations. Dynamic Host Configuration Protocol (DHCP).

UNIT-IV

MOBILE TRANSPORT LAYER: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT-V

SECURITY AND FRAUD DETECTION IN MOBILE AND WIRELESS NETWORKS: Network Security Problems, Network Security Management, Intrusion Detection System(IDS),Securing Data Transfer in Digital Mobile System, Securing Wireless Ad Hoc Networks, Authentication of Mobile

UNIT-VI

DATA BROADCAST: classification of new data delivery mechanisms, Data Scheduling, Air Indexing, Other Issues.
Ensemble Planning for Digital Audio Broadcasting: The Ensemble Planning Problem, Basic Solution Techniques, Lower Bounds.

UNIT-VII

MOBILE AD HOC NETWORKS AND ROUTING PROTOCOLS: Introduction, Unicast Routing Protocols for MANET, Broadcasting Protocols for MANET, Multicasting Protocols for MANET, QoS Routing, Extending Cellular Systems with Ad Hoc Links.

UNIT-VIII

WIRELESS APPLICATION PROTOCOL (WAP): Wireless issues, Fundamental MAC Protocols, Centralized MAC Protocols, Ad Hoc MAC Protocols.
TRAFFIC INTEGRATION IN PERSONAL, LOCAL, AND GEOGRAPHICAL WIRELESS NETWORKS: A technology for WPAN: Bluetooth, Technologies for High-Speed WLANs, Third Generation Cellular Systems:UMTS

TEXT BOOKS:

1. Jochen Schiller, *Mobile Communications*, 2nd Edition, Addison-Wesley, 2008.
2. Stojmenovic *, Handbook of Wireless Networks and Mobile Computing*, Wiley,2008.

REFERENCE BOOKS:

1. Reza Behravanfar *,Mobile Computing Principles,* , Cambridge University Press, October 2006.

2. Uwe Hansmann , *Principles of Mobile Computing* , Lothar Merk, Martin S.Nicklous, Thomas Stober, 2nd Edition, Springer International Edition, 2009.

MCA V Semester

10MC50106: SOFTWARE TESTING
(ELECTIVE-III)

L	T	P	C
4	-	-	4

UNIT-I

INTRODUCTION: Purpose of testing, Dichotomies, Model for testing, consequences of bugs, taxonomy for bugs.

UNIT-II

FLOW GRAPHS AND PATH TESTING: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-III

TRANSACTION FLOW TESTING: Transaction flows, transaction flow testing techniques.

DATAFLOW TESTING: Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-IV

DOMAIN TESTING: Domains and paths, Nice and ugly domains, domain testing, domains and interfaces testing, domains and testability.

UNIT-V

PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS: Path products and path expression, reduction procedure, applications, regular expressions and flow anomaly detection.

LOGIC BASED TESTING: Overview, decision tables, path expressions, K-V charts, specifications.

UNIT-VI

STATE, STATE GRAPHS AND TRANSITION TESTING: State graphs, good and bad state graphs, state testing, Testability tips.

UNIT-VII

METRICS AND COMPLEXITY: Metrics Objectives, Linguistic Metrics, structural Metrics, Hybrid metrics.

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

UNIT-VIII

SOFTWARE TESTING TOOLS TAXONOMY OF TESTING TOOLS: Methodology to evaluate automated testing tools, Load Runner, Win runner, Java Testing Tools- JMetre, JUNIT.

TEXT BOOKS:

1. Boris Beizer *, Software Testing techniques*, 2nd edition, Dreamtech Press, 2006.
2. Dr. K.V.K.K. Prasad *, Software Testing Tools,* 2nd edition, Dreamtech Press, 2006.

REFERENCE BOOKS:

1. Brian Marick *, The craft of software testing*, Pearson Education, 2007.
2. Loveland/Miller/Prewit/Shannon *, Software Testing Techniques*, SPD,2007.
3. Edward Kit *, Software Testing in the Real World*, Pearson Education, 2008.
4. William E.Perry *, Effective methods for Software Testing*, Wiley India Edition, 2008.
5. GlenFord J.Myers , The *Art of Software Testing*, 2nd Edition , Wiley India Edition, 2006.

MCA V Semester

10MC50107 : SEMANTIC WEB
(ELECTIVE-III)

L	T	P	C
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UNIT-I

WEB INTELLIGENCE: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web, Philosophical and Mathematical Logic, Kurt Gödel, Knowledge Representation, Computational Logic, Artificial Intelligence, Web Architecture and Business Logic, The Semantic Web.

UNIT-II

MACHINE INTELLIGENCE: Overview of Machine Intelligence, Artificial Intelligence, Semantic Networks and Frames, Reasoning with Semantic Networks, Computational Complexity, Description Logic(DL), Ontology, Inference engines, Software Agents, Adaptive Software's, Limitations and Capabilities. Berners-Lee: www, Semantic Web Road Map, Logic on the semantic Web.

UNIT-III

RESOURCE DESCRIPTION FRAMEWORK (RDF): HTML Language, XML Language, RDF Language, Basic Elements, RDF Schema.

WEB ONTOLOGY LANGUAGE (OWL): Ontology Language, Ontology Language Requirements, Compatibility of OWL and RDF/RDFS, the OWL Language, Basic Elements, OWL Example, Ontology Example, Applying OWL, OWL Capabilities and Limitations.

UNIT-IV

ONTOLOGY ENGINEERING: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries, Matching and Mapping,Ontology Mapping Tools.

UNIT-V

LOGIC, RULES AND INFERENCE: Logic and Inference, Monotonic and Nonmonotonic Rules, Description Logic, Inference Engines, RDF Inference Engine.

SEMANTIC WEB RULE LANGUAGE (SWRL): Rule Systems, Rule Languages, Semantic Web Rule Language (SWRL).

UNIT-VI

SEMANTIC WEB APPLICATIONS : Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Enterprise Application Integration, Knowledge Base**.**

Web Ontology Language FOR SERVICES: XML Based Web Services, Next-Generation Web Services, Creating an OWL-S Ontology for Web Services.

UNIT-VII

SEMANTIC SEARCH TECHNOLOGY: Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods, Latent Semantic Index Search, TAP, Swoogle.

UNIT-VIII

SEMANTIC PATTERNS AND ADAPTIVE SOFTWARE: Patterns in Software Design, Pattern Frame, Semantic Patterns, Self-Organizing and Adaptive Software and Semantic Tools, Semantic Doubts, Semantic Opportunities.

TEXT BOOKS:

1. Berners Lee, Gödel and Turing, *Thinking on the Web,* Wiley interscience, 2008.
2. Peter Mika, *Social Networks and the Semantic Web*, Springer, 2007.

REFERENCE BOOKS:

1. J.Davies, Rudi Studer, Paul Warren, *Semantic Web Technologies, Trends and Research in Ontology Based Systems,* John Wiley & Sons, 2006.
2. Heiner Stuckenschmidt, Frank Van Harmelen, *Information Sharing on the semantic Web*, Springer Publications,2007

3. T.Segaran, C.Evans, J.Taylor, *Programming the Semantic Web*, O'Reilly, SPD, 2009.

MCA V Semester

10MC50108: CLOUD COMPUTING
(ELECTIVE –IV)

L	T	P	C
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UNIT-I

INTRODUCTION TO VIRTUALIZATION: Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as a service – SaaS, grid computing, utility computing, virtualization processes.

UNIT-II

VIRTUALIZATION TECHNOLOGIES-I: ubuntu (server edition), altiris, windows, server, software virtualization, vmware, intel virtualization, red hat virtualization, softgrid application, Linux virtualization, desktop, virtualization, hardware virtualization, resource virtualization, processor virtualization, application virtualization.

UNIT-III

VIRTUALIZATION TECHNOLOGIES-II: Storage virtualization, virtualization density, para-virtualization, OS virtualization, virtualization software, data storage virtualization, Intel virtualization technology, thinstall virtualization suite, net framework virtualization, windows virtualization on fedora, storage virtualization technologies, virtualization level, security monitoring and virtualization, oracle virtualization.

UNIT-IV

VIRTUALIZATION AND STORAGE MANAGEMENT: The heart of cloud computing -virtualization, defining virtualization, why virtualize, what can be virtualized, where does virtualization happen, how does virtualization happen, on the road to storage virtualization, improving availability using virtualization, improving performance through virtualization, improving capacity through virtualization, business value for virtualization.

UNIT-V

INTRODUCTION TO CLOUD COMPUTING: Cloud Introduction and overview- Components, Infrastructure and Services, Why Use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology- Hardware & Software Infrastructure.

UNIT-VI

CLOUD COMPUTING ARCHITECTURE: Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, and Distributed Computing.

UNIT-VII

SECURITY: Security issues in Cloud Computing - Data Security, Network Security, and Host Security.

UNIT-VIII

DISASTER RECOVERY: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management, Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale.

CASE STUDIES: Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE.

TEXT BOOKS:

1. Ivanka Mennen, Gerard Blokdijk, *Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book*, 2009.
2. George Reese, *Cloud Application Architectures Building Applications and Infrastructure in the Cloud,* O'Reilly Media Press, 2009.

REFERENCE BOOKS:

1. Anthony T.Velte, Tobe J.Velte, Robert Elsenpeter, *Cloud Computing: A Practical Approach*,, Publication Person Education, 2009.
2. Tom Clark, Addison-Wesley, *Storage Virtualization: Technologies for Simplifying Data Storage and Management,* 2005.
3. Curtis Franklin Jr.Brian J.S. Chee**,** *Cloud Computing Technologies and Strategies of the Ubiquitous Data Center,* 2010.
4. Timothy Chou, *Introduction to Cloud Computing: Business & Technology*, 2009.

MCA V Semester

10MC50109: SERVICE ORIENTED ARCHITECTURE
(ELECTIVE-IV)

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UNIT-I

SOA AND WEB SERVICES FUNDAMENTALS: Introducing SOA-Fundamental SOA, Common Characteristics of Contemporary SOA, Common tangible benefits of SOA, Common pitfalls of adopting SOA, The Evolution of SOA, An SOA timeline, the continuing evolution of SOA, The roots of SOA.

UNIT-II

WEB SERVICES AND PRIMITIVE SOA: The Web Services frame work, Services, Service descriptions, messaging.

WEB SERVICES AND CONTEMPORARY SOA (Part I-Activity Management and Composition)**:** Message exchange patterns, Service Activity, Coordination, Atomic transactions, Business Activities, Orchestration, Choreography.

UNIT-III

WEB SERVICES AND CONTEMPORARY SOA (Part-II-Advanced Messaging, Metadata, and Security) Addressing, Reliable messaging, Correlation, Policies, Metadata exchange, Security, Notification and Eventing.

UNIT-IV

PRINCIPLES OF SERVICE-ORIENTATION: Service – Orientation and the enterprise, Anatomy of SOA, Common Principles of Service –Orientation, Interrelation between Principles of Service-Orientation, Service Orientation and Object Orientation, Native Web Service support for Principles of Service-Orientation.

UNIT-V

SERVICE LAYERS: Service-Orientation and Contemporary SOA, Service Layer abstraction, Application Service Layer, Business Service Layer, Orchestration Service Layer, Agnostic Services, Service Layer Configuration Scenarios.

SOA DELIVERY STRATEGIES: SOA delivery lifecycle phases, The top-down strategy, The bottom-up strategy, The agile strategy.

UNIT-VI

SERVICE ORIENTED ANALYSIS (Part I-Introduction)**:** Introduction to Service Oriented Analysis, Benefits of a Business Centric SOA, Deriving Business Services.

SERVICE ORIENTED ANALYSIS (Part-II-Service Modeling)**:** Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT-VII

BUILDING SOA (Technology and Design)

SERVICE ORIENTED DESIGN (Part I-Introduction)**:** Introduction to Service-Oriented design, WSDL related XML Schema language basics, WSDL language basics, Service interface design tools.

SERVICE ORIENTED DESIGN (Part II-SOA Composition Guidelines)**:** SOA Composing steps, Considerations for choosing service layers, Considerations for positioning core SOA standards, Considerations for choosing SOA extensions.

SERVICE ORIENTED DESIGN (Part III- Service Design)**:** Service Design overview, Entity-centric business Service Design, Application Service Design, Task-centric business Service Design, Service Design guidelines.

UNIT-VIII

SERVICE ORIENTED DESIGN (Part IV-Business Process Design)**:** WS-BPEL language basics, WS-Coordination overview, Service Oriented Business process Design, Fundamental WS-* Extensions, WS-Addressing language basics, WS-Reliable Messaging language basics, WS-Policy language basics, WS-Metadata Exchange language basics, WS-Security language basics.

TEXT BOOK:

1. Thomas Erl*, Service-Oriented Architecture-Concepts, Technology, and Design*, 1st Edition, Pearson Education, 2008.

REFERENCE BOOKS:

1. Eric Newcomer, Greg Lomow, *Understanding SOA with Web Services*, 1st Edition, Pearson Education, 2005.
2. David Schorow, Jeff Davies, Ashish Krishna, *The Definitive guide to SOA*, Apress, 2007.
3. E.Hewitt, Java *SOA Cook book*, O'REILLY, 2009.
4. James. McGovern, Sameer Tyagi, Michael E. Stevens, Sunil Mathew, *Java Web Services Architecture*, Morgan Kaufmann Publishers, 2003.

5. K.Rama Rao, C.Prasad, *SOA Security*, Dreamtech Press, 2007.

MCA V Semester

10MC50110: ENTERPRISE RESOURCE PLANNING
(ELECTIVE –IV)

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UNIT-I

INTRODUCTION TO ERP: Evolution of ERP – The Advantages of ERP - Integrated Management Information - Integrated Data Model – Business Process Reengineering, Executive Information Systems– Supply Chain Management.

UNIT-II

BUSINESS MODELLING FOR ERP : Building the Business Model : Finance, Plant Maintenance, Quality Management, Materials Management– Benefits of ERP : Reduction of Lead-Time, On-time shipment, Reduction in Cycle Time, Improved Resource Utilization, Better Customer Satisfaction, Improved Supplier Performance, Increased Flexibility, Reduced Quality Costs, Improved Information Accuracy and Decision making Capability.

UNIT-III

THE DEVELOPMENT OF ERP: ERP Software Emerges: SAP and R/3: SAP Begins Developing Software Modules, SAP R/3, New Directions in ERP, SAP R/3 Software Implementation.

UNIT-IV

PROCESS MODELING, PROCESS IMPROVEMENTS: Process Modeling: Flowcharting Process Models, Fitter Snacker Expense Report Process, Extensions of Process Mapping, Event Process Chain (EPC) Diagrams. **Process Improvement:** Evaluating Process Improvement, ERP Workflow Tools.

UNIT-V

ERP IMPLEMENTATION LIFECYCLE: ERP Implementation: Pre- evaluation Screening, Package Evaluation, Project Planning Phase, Gap Analysis, Reengineering, Configuration, Implementation Team Training, Testing, End-user Training, Post-implementation - Role of Consultant, Vendors and Users.

UNIT-VI

FUTURE DIRECTIONS IN ERP: New Markets, New Channels, Faster Implementation Methodologies, Business Models and BAPIs, Convergence on Windows NT, Application Platforms, New Business Segments, More Features, Web Enabling.

UNIT-VII

ERP PACKAGES: Introduction – SAP AG, Oracle Corporation, People Soft, JD Edwards World Solutions Company, Baan Company.

UNIT-VIII

CASE STUDIES: SAP R/3 at Kapp, Germany – PeopleSoft at Alcone Marketing Group – SAP R/3 at Mercedes-Benz – Oracle at Cisco-System – PeopleSoft at Morrison Express Corporation Ltd. – Oracle at Amwest Surety Insurance Company, Bann at Phonix Contractors A/S.

TEXT BOOKS:

1. Alexis Leon, *Enterprise resource planning*, Tata McGraw-Hil Publishing Company Limited, 1999.
2. Ellen Monk, Bret Wagner, *Concepts In Enterprise Resource Planning*, 2nd Edition, Thomson (Indian Edition).

REFERENCE BOOKS:

1. Alexis Leon, *ERP – Demystified,* 2nd Edition, Tata McGraw –Hill, 2008.
2. Vinodkumar Garg and V. K. Ventikrishnan, *Concepts in Enterprise Resource Planning,* 2nd Edition, PHI, 2004.

MCA V Semester

10MC50111: SOFTWARE QUALITY ASSURANCE
(ELECTIVE-IV)

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UNIT-I

INTRODUCTION TO SOFTWARE QUALITY: Quality, as a management Information System, Software modeling and commonly used models, The structure of the model, The Three CPIs, Establishment of a Software quality program.

UNIT-II

SOFTWARE QUALITY ASSURANCE PLANNING: an overview, Establishing quality goals, SQA Planning software productivity and documentation-A Case study, Software Quality Assurance Plan Purpose and scope.

UNIT-III

SOFTWARE QUALITY ASSURANCE MANAGEMENT : Organization, Quality Tasks, Responsibilities, A minimal QA effort, Factors Effecting the SQA effort, The critical personal question, Fundamental requirements, Documentation.

UNIT-IV

STANDARDS, PRACTICES, CONVENTIONS AND METRICS, REVIEWS AND AUDITS: The management review Process, The technical Review Process, The software Inspection Process, The walkthrough Process, The Audit Process, Document Verification , Document Audit and Verification Case study.

UNIT-V

TEST: The process of software testing, ISO 9000 Compatibility, CMM Compatibility, Software Testing Taxonomy, Anomalies, Category and priority classification for problem reporting , Testing organization, Pass/fail criteria , Requirement labels, Recovery, Unit testing Background, Unit test planning Activities, Test set acquisition activities, Measurement activities, Integration testing-background , system testing-background, Qualification testing–background, Acceptance testing-background.

UNIT-VI

PROBLEM REPORTING AND CORRECTIVE ACTION: Requesting a change, change costs, The CCB, CMM Compatibility, ISO 9000 Compatibility, Problem reporting, Problem Discovering, writing and verifying the software, Problem report, Corrective action, tools Techniques and methodologies.

UNIT-VII
CODE CONTROL: Emphasis vs De-emphasis, Version control, archiving, non deliverable code, CMM compatibility, ISO 9000 compatibility , media control, supplier control.

UNIT-VIII

RECORDS COLLECTION, MAINTENANCE AND RETENTION:Software quality metrics analysis, Training, Risk management, Comparison of the ISO Model with SEI's CMI.

TEXT BOOK:

1. Mordechai Ben-Menachem/Garry S.Marliss *, Software Quality*, India Edition, Cengage Learning ,2009.

REFERENCE BOOKS:

1. Stephen H .Kan *, Metrics and Models in Software Quality Engineering*, 2nd Edition , Pearson Education Publication ,2009.
2. G Gordon Schulmeyer *, Hand Book of Software Quality Assurance* , 4th Edition, Artech House Publishers.

3. William E. Lewis , *Software Testing and Continuous Quality improvement* , 3rd Edition, An Auerbach Publication, 2009.

MCA V Semester

10MC50112: MIDDLEWARE TECHNOLOGIES AND UML LAB

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RMI PROGRAMMING

Week-1

1. Communication: Create a server that accepts the request from client and client displays the server system information.
2. File transfer: Create a server that asks for a password, then opens a file and sends the file over the network connection. Create a client that connects to this server, gives the appropriate password, then captures and saves the file.

Week-2

3. Calculator: Create a remote server that implements a calculator with basic functionalities like addition, subtraction, division, multiplication and client, which uses the remote calculator.
4. Stock market: Create a remote stock server that accepts the company name and gives the share value. Stock client that retrieves the company share value and displays by giving the company name.

Week-3

5. Phone book server: Create a remote phone book server that maintains names and phone numbers. Phone book client should provide a user interface that allows the user to scroll through entries, add a new entry, modify an existing entry and delete an existing entry. The client and the server should provide proper error handling.

.NET PROGRAMMING AND UML

Week-4

1. Working with callbacks and delegates in C# : Demonstrates the use of delegates, callbacks, and synchronous and asynchronous method invocation, including how Microsoft .NET Framework classes provide explicit asynchronous support using the BeginXXXX and EndXXXX naming conventions and how you can make use of this support in your own code.

Week-5

2. Code access security with C# : Demonstrates the use of .NET Framework Code Access Security, in which code can have permissions independent of the person executing the code.

Week-6

3. Design UML Diagrams for a Passport Application .

Week-7

4. Creating a Windows Service with C# : Demonstrates how to create a Microsoft Windows Service that uses a File System Watcher object to monitor a specific directory for changes in files.

Week-8

5. Read and Write Images to a SQL Server Database with C# : Demonstrates how to upload images into SQL Server by using standard HTML upload methods and then insert each image as a byte array into SQL Server.

Week-9

6. Interacting with a Windows Service with C# : Develop a sample application that launches a Windows Form to allow the user to interact and manipulate the IIS Admin service on the local machine. The application should work by placing an icon in the System Tray.

Week-10

7. Construct various UML Diagrams for a ATM Application.
8. Partitioning an Application into Multiple Assemblies with C# : Understand why it can be beneficial to create separate modules for an application download, and then demonstrate how to do so with C#.

Week-11

9. Using System Printing in C# Applications: Develop a sample application that shows how to print a formatted report from sample data stored in an XML file using the PrintDocument class in the System.Drawing.Printing namespace. Also illustrates the user selection of a destination printer and multiple print fonts.

Week-12

10. Draw all the UML Diagrams for an Library Management System.

11. Using Reflection in C# : Demonstrate how to gather information on various types included in any assembly by using the System. Reflection namespace and some main .NET base classes.

Week-13

12. Sending Mail with SMTP Mail and C# : Uses a simple Web form to demonstrate how to use the SMTP Mail class in the .NET Framework.
13. Perform String Manipulation with the String Builder and String Classes and C# : Demonstrates some basic string manipulation using both the String Builder and String classes.

Week-14

14. Application Configuration Using Configuration Files and the Registry Using C# : A sample application that demonstrates methods of storing application settings by making use of both the system registry and application configuration files. Implements a custom configuration section to show how you can tailor these files to the specific needs of a particular application.
15. Using the System.Net.WebClient to Retrieve or Upload Data with C# : Demonstrate how to create a Windows Form that can use HTTP to download and save a resource from a specified URI, upload a resource to a specified URI, or read and write data through a stream object.

Week-15

16. Web Services Security with C# : Examines how to use IIS to perform user authentication so that no changes to the Web Service are required in order to provide superior security.

Week-16

17. Reading and Writing XML Documents with the XmlTextReader and XmlTextWriter Class and C# : Demonstrate how to retrieve information from an existing XML document and how to create a new XML document.

MCA V Semester

MC50113: MINI PROJECT

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MCA V Semester

10MC50114: SEMINAR
(AUDIT COURSE)

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Rules of Disciplinary Action for Malpractice/Improper conduct in Examinations

S. No.	Nature of Malpractice / Improper Conduct	Rule No.	Punishment
1.	Possession of unauthorised material in printed or handwritten form or electronic devices	Rules 1(a), 1(b)	Expulsion from the examination hall and cancellation of examination in that subject. If any outside person involves and helps the candidate for malpractice, the outside person is handed over to the police and a case is registered.
2.	If the candidate copies evidently from various sources like, hand written material, typewritten or Photostat material, writing on body arms or clothes, writing with pen/pencil on calculators, scales, hall ticket, rubber etc.	Rule 2	Expulsion from the examination hall and cancellation of exam in that subject and all other subjects the candidate has appeared, including practical examinations and project work. He/she shall not be permitted to appear for the remaining examinations.
3.	If any person imperso-nates the other candidate in the examination.	Rule 3	If the person is a student of the College he shall be expelled from examination and debarred. He shall forfeit the seat. The performance of the original candidate is cancelled for that series of examination and debarred for two semesters. If the person is an outsider, he/she shall be handed over to the police and a case is registered.
4.	If the candidate attempts to steal/mutilate/damage (or) tries to send out the answer book (or) Takes out (or) arranges to send out the question paper during the examination.	Rule 4	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared, including practical examinations and project work. He/she shall not be permitted for the remaining examinations of the courses in that semester/year. The candidate is also debarred for two consecutive semesters. **This matter shall be reported to police and a case is registered**
5.	If the candidate uses objectionable, abusive or offensive language in the answer paper, or writes to the examiner requesting him to award	Rule 5	Cancellation of the perfor-mance in that course.

	pass marks.		
6.	If the candidate refuses to obey the examination authorities (or) misbehaves (or) creates disturbance of any kind in and around the examination hall (or) organizes a walk out, (or) threatens (or) assaults the invigilator and indulges in the act of misconduct, destruction of property on the campus.	Rule 6	In case of students of the college, they shall be expelled from examination and their examination performance stands cancelled. In case of outsiders, they will be handed over to the police and a case is registered against them.
7.	If the candidate possesses any lethal weapon or firearm in the examination hall.	Rule 7	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared, including practical examinations of the subjects of that Semester /year. The candidate is also debarred and forfeits the seat. **This matter shall be reported to police and a case is registered**
8.	If a student of the College, who is not a candidate for the particular exam or any person not connected with the College indulges in any malpractice or improper conduct mentioned in clauses 6 and 7.	Rule 8	For student of the College expulsion from the examination hall and cancellation of the performance in that series of examination. The candidate is also debarred and forfeits the seat. For persons who do not belong to the college will be handed over to the police and a case is registered.
9.	If the candidate comes in an intoxicated/inebriated condition to the examination hall.	Rule 9	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared, including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year
10.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Rule 10	Cancellation of the performance in that subject and all other subjects the candidate has appeared, including practical examinations and project work of that semester/year

			examinations.
11.	If any malpractice is detected which is not covered in the clauses 1 to 10 above, shall be brought to the notice of the Chief Controller of Examinations.		

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Salient Features of Prohibition of Ragging in Educational Institutions Act 26 of 1997

- Ragging within or outside the College is prohibited.
- Ragging means doing an act which causes or is likely to cause insult or annoyance or fear or apprehension or threat or intimidation or outrage of modesty or injury to a student

Nature of Ragging	Punishment
Teasing, Embarrassing and humiliating	Imprisonment up to 6 months or fine up to Rs. 1,000/- or Both
Assaulting or using criminal force or criminal intimidation	Imprisonment up to 1 year or fine up to Rs. 2,000/- or Both
Wrongfully restraining or confining or causing hurt	Imprisonment up to 2 years or fine up to Rs. 5,000/- or Both
Causing grievous hurt, Kidnapping or rape or committing unnatural offence	Imprisonment up to 5 years or fine up to Rs. 10,000/-
Causing death or abetting suicide	Imprisonment up to 10 years or fine up to Rs. 50,000/-

Note:

1. A student convicted of any of the above offences, will be expelled from the College.
2. A student imprisoned for more than six months for any of the above offences will not be admitted in any other College.
3. A student against whom there is prima facie evidence of ragging in any form will be suspended from the College immediately.
4. The full text of Act 26 of 1997 and UGC Regulations on Curbing the Menace of Ragging in Higher Educational Institutions, 2009 **(Dated 17th June, 2009) are placed in the College library for reference.**