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Supporting Document for 1.1.3

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Courses having focus on

Employability/ Entrepreneurship/ skill Development

Program: B.Tech.- Information Technology

Regulations : SVEC-14

The Courses (with course outcomes) under SVEC-14 Regulations which focus on **employability/ entrepreneurship/ skill development** are highlighted with the following colours.

Skill

Employability

Entrepreneurship

B.Tech I Year
14BT1HS01: TECHNICAL ENGLISH
(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	2 - - 4

PREREQUISITES: Basic Grammar and Fundamentals of Writing Skills**.**

COURSE DESCRIPTION: The course consists of lessons which include characters, speeches and short stories: 'My Early Days', 'Speech by N. R. Narayana Murthy', 'Dr. C.V. Raman: The Celebrated Genius', 'The Town by the Sea' and 'The Model Millionaire'. The course also covers the principles of Language and Communication Skills (Listening, Speaking, Reading and Writing Skills).

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**

1. Acquire fundamental and functional knowledge of English Language, grammar and communication skills.
2. Identify and analyze productive skills (speaking and writing) and receptive skills (listening and reading) of English Language proficiency for effective communication and practice.
3. Design and develop functional skills for professional practice through English.
4. Communicate effectively with the engineering community and society to comprehend and deliver effective solutions.
5. Inculcate an attitude to upgrade competence of English knowledge and communication to engage in independent and lifelong learning.

Detailed Syllabus:

UNIT – I: (10 periods)
My Early Days by **A. P. J. Abdul Kalam** from **All About English** by Cambridge University Press India Pvt Ltd. 2014.
Communication: Importance of Communication – Language as a tool of Communication – Communicative Skills (Listening, Speaking, Reading and Writing) – Effective Communication – Verbal and Non-Verbal Communication.
UNIT – II: (10 periods)
A Speech by N. R. Narayana Murthy from **All About English** by Cambridge University Press India Pvt Ltd, 2014.
Listening: Meaning and Art of Listening – Importance of Listening – Traits of a Good Listener – Reasons for Poor Listening – Types of Listening– Barriers to Effective Listening
UNIT – III: (10 periods)
The Town by the Sea by Amitav Ghosh from **All About English** by Cambridge University Press India Pvt Ltd, 2014.

Speaking: Achieving Confidence, Clarity, and Fluency – Paralinguistic Features – Types of Speaking – Barriers to Speaking.
UNIT – IV: (10 periods)
Sir. C. V. Raman: The Celebrated Genius from **All About English** by Cambridge University Press India Pvt. Ltd, 2014.
Reading: Reading and Interpretation – Intensive and Extensive Reading– Critical Reading – Reading Comprehension – Techniques for Good

Comprehension – SQ3R Reading Technique

UNIT – V: **(10 periods)**
The Model Millionaire by **Oscar Wilde** from **All About English**
by Cambridge University Press India Pvt. Ltd, 2014.

Writing: Characteristics – Language – Elements of Style – Techniques for
Good Technical Writing – Avoiding Plagiarism - Referencing and Styling.

Total Periods: 50

TEXT BOOKS:

1. **"All About English***,"* Cambridge University Press India Pvt. Ltd.,
   First Edition, 2014.

2. Mee nakshi Raman and Sangeetha Sharma, **"Technical
   Communication,"** Oxford University Press, New Delhi, 2012.

REFERENCE BOOKS:

1. M. Ashraf Rizvi, **"Effective Technical Communication,"** Tata
   McGraw–Hill, Publishing Company Limited, First Edition, 2005.

2. Martin Hewings, **"Advanced English Grammar: A Self Study
   Reference and Practice Book for Advanced South Asian
   Students,"** Cambridge University press, First South Asian Edition,
   New Delhi, 1999.

B.Tech I Year
14BT1BS01: ENGINEERING PHYSICS
(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	2 1 - 4

PREREQUISITES: Intermediate/Senior Secondary Physics.

COURSE DESCRIPTION: The course deals with different lasers, optical fibers and holograms, theory of relativity, acoustics of buildings, crystallography, principles of quantum mechanics, band theory of solids, properties of dielectric materials, semiconductors, properties and application of magnetic materials, nanomaterials, and superconductors.

COURSE OUTCOMES :

After the successful completion of the course, the student will be able to:

1. Acquire basic knowledge of lasers, optical fibers, holography, theory of relativity, acoustics, crystallography, quantum mechanics, dielectrics, magnetic materials, semiconductors, superconductors and nanomaterials.
2. Develop skills in designing of lasers, fiber optic cable, holograms, acoustically good hall, semiconductor devices and nanomaterials.
3. Develop problem solving skills in engineering context.

Detailed Syllabus:

UNIT-I: LASERS, FIBER OPTICS AND HOLOGRAPHY (18 periods)

Lasers: Introduction, characteristics of laser, principles of lasing action, spontaneous and stimulated emission of radiation, Einstein's coefficients, population inversion, Ruby laser, Helium-Neon laser, semiconductor laser, applications of lasers.

Fiber optics: Introduction, construction and working principle of optical fiber, acceptance angle, acceptance cone and numerical aperture, types of optical fibers and refractive index profiles, attenuation and losses in fibers, optical fiber communication system, applications of optical fibers in sensors and medicine.

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

UNIT-II: SPECIAL THEORY OF RELATIVITY, ACOUSTICS OF BUILDINGS AND CRYSTALLOGRAPHY (16 periods)

Special Theory of Relativity: Introduction, absolute frame of reference, time dilation, length contraction, addition of velocities, mass-energy equivalence, energy-momentum relation.

Acoustics of Buildings: Introduction, basic requirement of acoustically good hall, reverberation and time of reverberation, Sabine's formula for

reverberation time (qualitative treatment), absorption coefficient of sound and its measurement, factors affecting the architectural acoustics and their remedies.

Crystallography: Introduction, crystal planes, crystal directions and Miller indices, separation between successive (hkl) planes, X-ray diffraction by crystal planes, Bragg's law, Laue and powder methods.

UNIT-III :PRINCIPLES OF QUANTUM MECHANICS AND BAND THEORY OF SOLIDS   (17 periods)

Principles of Quantum Mechanics: Black body radiation – Wien's law, Rayleigh-Jeans law and Planck's law (qualitative treatment), waves and particles, matter waves, de-Broglie's hypothesis, G.P. Thomson experiment, Heisenberg's uncertainty principle, Schrödinger's one dimensional wave equation (time independent), significance of wave function, particle in a one dimensional potential box, Fermi-Dirac distribution and effect of temperature (qualitative treatment), scattering-source of electrical resistance.

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

UNIT-IV: DIELECTRIC PROPERTIES OF MATERIALS AND SEMICONDUCTORS   (17 periods)

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

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

UNIT-V :MAGNETIC PROPERTIES OF MATERIALS, SUPERCONDUCTIVITY AND NANOMATERIALS   (17 periods)

Magnetic Properties of Materials: Introduction, origin of magnetic moment, classification of magnetic materials into dia, para, ferro, anti-ferro and ferri magnetism, hysteresis, soft and hard magnetic materials.
Superconductivity: General properties, Meissner effect, penetration depth, Type-I and Type-II superconductors, flux quantization, Josephson effects, BCS theory, applications of superconductors.
Nanomaterials: Introduction, surface area to volume ratio, quantum confinement, properties of nanomaterials, synthesis of nanomaterials by ball milling, plasma arcing, pulsed laser deposition and sol-gel methods,

carbon nanotubes-propertie s and applications, applications of nanomaterials.

                                             Total Periods:85

TEXTBOOKS :

   1.   S. Mani Naidu, **"Engineering Physics,"** Pearson Education, 2013.

   2.   P. K. Palaniswamy, **"Engineering Physics,"** Scitech Publications.

REFERENCE BOOKS:

   1. R. K. Gaur and S. L. Gupta, **"Engineering Physics,"** DhanpatRai Publications (P) Ltd., Eighth Edition, 2001.

   2. M. R. Srinivasan, **"Engineering Physics,"** New Age International (P) Limited, Publishers, First Edition, 2010.

B.Tech I Year
14BT1BS02 : ENGINEERING CHEMISTRY
(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	2 1 - 4

PREREQUISITES: Intermediate/Senior Secondary Chemistry.

COURSE DESCRIPTION: This course deals with various engineering materials, electro-chemical cells, corrosion, water technology, fuel technology, lubricants, nano chemistry, and green chemistry.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**

1. Acquire basic knowledge in liquid crystals, conducting Polymers, Composites, Chemical sensors, insulators, Electro chemical cells, corrosion phenomenon, fuels, Nanomaterials and principles of Green Chemistry and Green Engineering.
2. Develop analytical skills in:
    a. Determination of hardness of water.
    b. Determination of viscosity, flame and fire points, cloud and pour points.
    c. Determination of calorific value of fuels.
3. Develop skills in design of:
    a. Methods for control of corrosion
    b. Chemical methods for the synthesis of Nanomaterials.
4. Develop skills for providing solutions through:
    a. Mitigation of hardness of water.
    b. Control of corrosion
    c. Newer Nanomaterials for specific applications
5. Acquire awareness to societal issues on:
    a. Chemical materials utility and their impact.
    b. Quality of water.
    c. Phenomenon of corrosion.
6. Imbibe attitude to practice engineering in compliance to environmentally benign techniques such as:
    a. Green computing
    b. Green construction
    c. Green manufacturing systems

Detailed Syllabus:

UNIT – I: CHEMISTRY OF ENGINEERING MATERIALS (18 periods)

Liquid Crystals – Introduction, chemical structure, classification, engineering applications.

Conducting Polymers – Definition, types of conducting polymers and their engineering applications. **Composites** – Introduction, advantages

of composites, constituents of composites, types of composites, applications of composites. **Sensors** - Introduction, types of sensors, electrochemical sensors, applications. **Insulators** – Definition, characteristic properties of insulators and classification of insulators.

UNIT–II: WATER TECHNOLOGY   (15 periods)

Introduction, types of water, impurities in water and their consequences. Hardness of water, units of hardness, measurement of hardness by EDTA method, disadvantages of hardness. Softening methods – Ion exchange process, Zeolite process-Municipal water treatment. Boiler Troubles. Desalination of brackish water by Electro dialysis and Reverse osmosis. Numerical problems on measurement of hardness of water.

UNIT–III: ELECTROCHEMICAL CELLS AND CORROSION (17 periods)

Electrode potential, Nernst's equation, Electrochemical cells, EMF of an electrochemical cell. Reference electrodes- Standard Hydrogen Electrode (SHE), Calomel electrode.

Batteries: Introduction, types of Batteries. Ni-Cd battery, lithium – ion battery-applications.

Fuel Cells: Definition, $H_2 – O_2$ fuel cell, phosphoric acid fuel cells, proton exchange membrane fuel cells, solid oxide fuel cells. Applications of fuel cells.

Corrosion: Introduction, definition, types of corrosion, galvanic corrosion, concentration cell corrosion, control of corrosion – Electroplating method (Nickel electroplating).

UNIT–IV: LUBRICANTS AND FUEL TECHNOLOGY   (18 periods)

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

Fuel Technology: Introduction, classification, characteristics of a good fuel, calorific value, liquid fuels, petroleum, refining of petroleum, knocking, octane number, cetane number, power alcohol, synthetic petrol, gaseous fuels, important gaseous fuels.

UNIT–V: NANO CHEMISTRY AND GREEN CHEMISTRY (17 periods)

Nano Chemistry: Introduction, classification of nanomaterials, properties of nanomaterials, methods of synthesis – sol-gel process, Chemical Vapour Deposition (CVD), Plasma Enhanced Chemical Vapour Deposition (PECVD). Applications of nanomaterials.

Green Chemistry: Introduction, tools of Green chemistry, principles of green chemistry, examples of Green chemistry, principles of Green

Engineering, Green computing, Green construction, Green manufacturing systems.

Total Periods : 85

TEXT BOOKS:

1. P.C.Jain & Monika Jain, **"Engineering Chemistry,"** Dhanpat Rai Publishing Company (P) Ltd, New Delhi, Seventeenth Edition, 2013.

2. K.N. Jayaveera, G.V. Subba Reddy & C. Ramachandraiah **"Engineering Chemistry,"** Mc. Graw-Hill Higher Education, Hyderabad, First Edition, 2013.

REFERENCE BOOKS:

1. A.K. Bandyopadhyay, **"Hand book of Nanostruc tured**

materials and Nanotechnology," New Age international publishers, Second Edition, 2010.

2. Paul T. Anastas, John C Warner, **"Green Chemistry: Theory and practice,"** Oxford University Press, 2000.

B.Tech I Year
14BT1BS03 : ENGINEERING MATHEMATICS
(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 6

PREREQUISITES: Intermediate/ Senior Secondary Mathematics

COURSE DESCRIPTION: Engineering mathematics is an application oriented course for various fields of engineering. In this course, Differential equations, partial differentiation as applied to various engineering problems; Integration and its applications to find lengths, areas and volumes of objects, Laplace transforms and their applications, fundamentals of vector calculus are presented.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**

1. Acquire knowledge in Differential equations, finding maximum and minimum values attained by functions of several variables, evaluating double and triple integrals, Laplace transforms and differentiation and integration of vector functions.
2. Develop analytical skills in solving problems involving
    (a)   Non homogeneous linear differential equations
    (b)   Flux and fluid mechanics by vector methods.
    (c)   Complex integrations using Laplace transforms.
    (d)   the length of curves, areas , surfaces and volumes of revolutions.
3   Develop skills in designing Mathematical models for
    (a)   L-C and R-C circuits.
    (b)   Newton's Law of cooling and heat transfer.
4   Develop skills in providing solutions for
    (a)   problems involving L-R-C oscillatory circuits
    (b)   linear, surface and volume integrals by vector methods
    (c)   work done, flux through vector integrations

Detailed Syllabus:

UNIT-I : DIF FERENTIAL EQUATIONS- APPLICATIONS
(20 periods)

Ordinary differential equations – Linear and Bernoulli type – exact equations and reducible to exact. Orthogonal trajectories (both cartesian and polar forms). Newton's Law of cooling, Law of natural growth and decay. 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, $e^{ax} V(x)$, $x V(x)$. Method of variation of parameters . Applications to L-R-C circuits.

UNIT-II: PARTIAL DIFFERENTIATION & APPLICATIONS OF DERIVATIVES   (22 periods)

Functions of two or more variables – Homogeneous functions – total derivatives – derivatives of implicit function – Jacobian – maxima and minima of functions of two variables with and without constraints – Lagrange's method of undetermined multipliers. Radius ,centre and circle of curvature, tracing of curves in cartesian, parametric and polar forms.

UNIT-III: APPLICATIONS OF INTEGRATION   (18 Periods)

Applications of integration to – length of curves, area of surfaces of revolution and volume of solids of revolution – Double integrals – change of variables and change of order of integration. Evaluation of Triple integrals -volume as double integral.

UNIT-IV: LAPLACE TRANSFORMS- APPLICATIONS   (20 periods)

Laplace transforms of standard functions – Properties of Laplace transforms–First and second shifting Theorems. Laplace transforms of derivatives and integrals–Laplace transforms of periodic functions – Unit step function – Dirac delta function – Inverse transforms–Convolution theorem. Applications of Laplace transforms to linear differential equations with constant coefficients.

UNIT-V : VECTOR CALCULUS (20 periods)

Vector differentiation – 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).

Total periods : 100

TEXT BOOK:

1. T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad, **"Engineering Mathematics, Vol. 1,"** S. Chand & Company, Twelfth Edition, 2013.

REFERENCE BOOKS:

1. Grewal, B.S., **"Higher Engineering Mathematics,"** Khanna Publishers, 42 Edition, 2012.

2. Kreyszig, E., **"Advanced Engineering Mathematics,"** John Wiley and Sons, Eighth Edition, 2006.

B.Tech I Year
14BT1BS04 : MATHEMATICAL METHODS
(Common to CSE, CSSE, IT, ECE, EIE and EEE)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 6

PREREQUISITES: Intermediate/ Senior Secondary Mathematics

COURSE DESCRIPTION: This course deals with obtaining the numerical solutions for algebraic and transcendental equations. Fundamentals of matrix theory including introduction to Eigen values, Cayley- Hamilton's theorem, numerical solutions to differential equations, transformation techniques for solving engineering problems and applications of partial differential equations are presented.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**

1. Acquire basic knowledge in
    (a) solving linear equations through matrix methods.
    (b) solving algebraic and transcendental equations by various mathematical methods.
    (c) fitting of various types of curves to the given data
    (d) finding the numerical values to derivatives and integrals through different mathematical methods.
    (e) solving differential equations numerically through various methods.
    (f) solving difference equations using z –transforms.
2. Develop analytical skills in
    (a) evaluating the properties of functions through Fourier series and Fourier transforms.
    (b) solving boundary value problems in engineering using Fourier transform
3. Design novel mathematical methods for
    (a) fitting geometrical curves to the given data.
    (b) for solving the differential equations.
    (c) the problems involving heat transformations.
    (d) constructing the interpolating polynomials to the given data and drawing inferences.

Detailed Syllabus:

UNIT–I: MATRIX THEORY AND APPLICATIONS   (20 periods)

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. Solutions of equations by Gauss elimination method. Eigen values, Eigen vectors and properties. Cayley– Hamilton Theorem (without proof), inverse and powers of a matrix using Cayley– Hamilton Theorem, diagonalization of a matrix, quadratic forms, nature of quadratic form and reduction of quadratic form to its normal form.

UNIT- II: NU MERICAL SOLUTIONS, CURVE FITTING AND INTERPOLATION   (19 periods)

Solutions of Algebraic and Transcendental equations by bisection method, Regula – Falsi method, Newton – Raphson method. Curve fitting by the principle of least squares, fitting of a straight line, parabola and exponential curves. Interpolation, forward difference operator, backward difference operator, central difference operator. Relationship

between different operators. Interpolation using Newton's forward formula, Newton's backward formula, Lagrange's interpolation formula.

UNIT-III: NUMERICAL DIFFERENTIATION AND INTEGRATION, SOLUTIONS OF O D E (20 periods)

Numerical differentiation using Newton's forward formula, Newton's backward formula. Numerical integration using trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule. Numerical solutions of first order ordinary differential equations using Taylor series, Euler's method modified Euler's method, Runge – Kutta method (4 th order only).

UNIT-IV : TRANSFORMATION TECHNIQUES (25 periods)

Fourier series , Dirichlets conditions, determination of Fourier coefficients (Euler's formulae), even and odd functions. Half-range Fourier sine and cosine expansions. Fourier integral theorem (statement only), Fourier sine and cosine integrals, Fourier sine and cosine transforms, inverse transforms. 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 – V: APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS (16 periods)

Formation of partial differential equations . Method of separation of variables for second order partial differential equations – solutions of one dimensional wave equation – heat equation -Laplace equation.

Total periods: 100

TEXTBOOK:

1. T.K.V. Iyenger, B. Krishna Gandhi, S. Ranganadham and M.V.S.S.N. Prasad, **"Mathematical Methods*,"*** S.Chand and Company, Eighth Edition, 2013.

REFERENCE BOOKS:

1. B.S. Grewal, **"Higher Engineering Mathematics,"** Khanna publishers, 42 Edition, 2012.

2.   S.S.Sastry, **"Introductory Methods of Numerical Analysis,"** Prentice Hall of India, Fourth Edition, 2005.

B.Tech I Year
14BT1ES02: PROBLEM SOLVING AND COMPUTER PROGRAMMING
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 6

PREREQUISITES: Aptitude and Logical Thinking

COURSE DESCRIPTION: This course deals with the concepts of problem solving, algorithms and program design, elements of 'C' programming language, data types, selection, multi-way selection, repetition, arrays, strings, functions, derived data types, structures, pointers, files and basic data structures of stacks, and queues.

COURSE OUTCOMES:
After the successful completion of the course, the student will be able to:
1. Gain knowledge in
   - Problem solving Methods and Fundamental Algorithms.
   - Elements of C Language
   - Selection and Repetition statements.
   - Arrays, Strings and Functional statements.
   - Derived data types, Files and Pointers.
   - Basic data Structures-Stacks and Queues.
2. Analyze the problems and develop appropriate algorithms.
3. Implement various searching and sorting techniques
4. Apply basic data structures such as arrays, stacks and queues in application programs.
5. Engage in lifelong learning to develop programming competence.

Detailed Syllabus:

UNIT – I: (20 periods)
Introduction to Problem Solving: Algorithm and flowchart, the problem solving aspect, top-down design, implementation of algorithms, program verification and efficiency of algorithms.
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 – II: (22 periods)
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.

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 -III: **(20 periods)**

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.

Functions: Designing structured programs, functions in C, user- defined functions, types of functions, Recursion and factorial using recursion, standard library functions, scope, storage classes and pre-processor directives

UNIT – IV: **(20 periods)**

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

UNIT – V: **(18 periods)**

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 and Circular queue operations (insertion, deletion) using arrays.

                                        Total periods: 100

TEXT BOOKS:

1. Behrouz A. Forouzan and Richard F. Gilberg, "**A Structured Programming Approach using C**," Third Edition, Cengage Learning, NewDelhi, 2007.

2. R.G. Dromey, "**How to Solve it by Computer,**" First Edition, Pearson Education, NewDelhi, 1982.

REFERENCE BOOKS:

1. Pradip Dey and Manas Ghosh, "**Programming in C,**" Second Edition, Oxford University Press, NewDelhi, 2007.

2. Jeri R Hanly and Elliot B. Koffman, "**Problem Solving and Program design in C,**" Seventh Edition, Pearson Education, NewDelhi, 2014.

B.Tech I Year

14BT1ES03: COMPUTER - AIDED ENGINEERING DRAWING

(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- 1 3 3

PREREQUISITES: - - -

COURSE DESCRIPTION: This course deals with the concepts of computer-aided sketching, and orthographic and isometric projections of geometric entities (both 2D and 3D) through computer aided drafting packages.

COURSE OUTCOMES:

After the successful completion

32of the course, the student will be able to**:**

1. Produce different views and projections in drawing.
2. Use modern CAD software for different designs.
3. Create multi-view drawings suitable for presentation to a general audience.

Detailed Syllabus:

UNIT I – INTRODUCTION TO COMPUTER AIDED SKETCHING

(20 periods)

Introduction, Drawing Instruments and their uses, BIS conventions, Lettering, Dimensioning, Different types of lines, Material conventions and free hand practicing, Definitions of Principle planes and other planes.

Computer screen, layout of the software, Creation of 2D/3D environment, Selection of drawing size and scale, Standard tool bar/menus, Coordinate system, and description of most commonly used toolbars, Navigational tools, Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity.

UNIT II – ORTHOGRAPHIC PROJECTIONS   (20 periods)

Introduction, Definitions- Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only), Projection of lines inclined to one plane, inclined to both the planes, finding true lengths and true inclinations (No application problems).

UNIT III – ORTHOGRAPHIC PROJECTIONS OF PLANE SURFACES

(20 periods)

Introduction, Definitions-projections of plane surfaces-triangle, square, rectangle, rhombus, pentagon, hexagon and circle, planes in different positions by change of position method only (Simple problems inclined to

any one plane only)

UNIT IV – PROJECTIONS OF SOLIDS   (20 periods)

Introduction, Projections of right regular prisms, pyramids, cylinders and cones in different positions (Simple problems inclined to any one plane only). Isometric projections and isometric views.

UNIT V – SECTIONS AND DEVELOPMENT OF LATERAL SURFACES OF

SOLIDS   **(20 periods)**

Introduction, Section planes and sectional views of right regular solids - prisms, cylinder, pyramids and cone resting with base on HP. True shapes of the sections.

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

Total Periods: 100

TEXT BOOKS:
1. D.M. Kulkarni, A.P. Rastogi and A.K. Sarkar, **"Engineering Graphics with Auto CAD,"** PHI Learning Private Limited, Revised Edition, August 2010.
2. N D Bhat & V M Panchal, **"Engineering Drawing,"** Charotar Publishing House, Gujarat, 51st edition, 2013.

REFERENCE BOOKS:
1. Sham Tickoo, **" Auto CAD 2013 F or Engineers And Designers,"** Dreamtech Press, 2013
2. T Jeyapoovan, **"Engineering Drawing and Graphics Using Autocad,"** Vikas Publishing House, Third Edition, 2010.
3. A. Jolhe, **"Engineering Drawing,"** Tata McGraw Hill Education Private Limited, First Edition, 2007.
4. Basant Aggarwal, **"Engineering Drawing,"** Tata McGraw Hill Education Private Limited, First Edition, 2008.

B.Tech I Year

14BT1BS05: ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LABORATORY

(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 3

PREREQUISITES: Intermediate Physics & Chemistry

COURSE DESCRIPTION:

Engineering Physics: The course deals with experimental verification of characteristics of p-n junction diode, photodiode, LED, and semiconductor laser diode. It also covers experimental determination of energy gap and carrier concentration of a semiconductor material, wave length of a laser source, rigidity modulus of a material, size of fine particle, dielectric constant, numerical aperture of optical fibre, frequency of electrically vibrating tuning fork and magnetic field along axial line of a current carrying coil. Verification of transverse laws of stretched string is also included.

Engineering Chemistry: This course deals with the estimation of hardness, alkalinity and dissolved oxygen of water samples by volumetric methods. It provides hands-on experience on different instrumental methods such as conductivity meter, potentiometer, pH meter, and colorimeter. This course also deals with the methods of synthesis of nano metal-oxides and novalac resin.

COURSE OUTCOMES:

Engineering Physics:

After the successful completion of the course, the student will be able to:

1. Acquire analytical skills in the determination of

    a) Wave length of laser.

    b) Divergence angle for laser beam.

    c) Numerical aperture of an optical fibre.

    d) Hall coefficient for semiconductor material.

    e) Energy gap of semiconductor material.

    f) Verifying the laws of stretched string.

    g) Characteristics of p.n. junction diode, and light emitting diode.

Engineering Chemistry:

After the successful completion of the course, the student will be able to:

1. Acquire analytical skills in the estimation of hardness of water, alkalinity of water, dissolved oxygen in water and estimation of

iron through wet laboratory methods.

2. Acquire analytical skills in the determination of P^H of a solution, EMF of a solution, spectrophotometric determination of iron and estimation of iron in cement through instrumental methods of analysis.

3. Develop skills in the designing of synthetic methods for the preparation of polymers and Nanomaterials.

List of Experiments :

Engineering Physics:

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

1. Determination of wavelength of a laser source using diffraction grating
2. Determination of numerical aperture of an optical fiber
3. I-V Characteristics of a p-n junction diode
4. Characteristics of LED source.
5. Hall effect
6. Photo diode – characteristics
7. Energy gap of a material of a p-n Junction
8. Magnetic field induction along the axis of a current carrying coil-Stewart and Gee's method
9. Melde's experiment - transverse & longitudinal modes
10. Verification of transverse laws of stretched string - Sonometer
11. Determination of dielectric constant.
12. Characteristics of laser source.
13. Determination of particle size by using a laser source
14. Determination of the rigidity modulus of the material of wire using torsional pendulum

Duration: 3 Periods for each experiment
Total periods: 30

Engineering Chemistry:

A minimum of any **Ten** experiments are to be conducted among the following:

1. Estimation of Hardness of water by EDTA method.
2. Estimation of alkalinity of Water.
3. Estimation of Dissolved Oxygen in water.
4. Estimation of Ferrous Iron by Dichrometry.
5. Conductometric titration of strong acid Vs strong base
6. Determination of P^H of a given solution by P^H metry.
7. Estimation of Ferrous ion by Potentiometry.
8. Estimation of Ferric iron in cement by Colorimetric method.
9. Preparation of Novalac Resin.

10. Synthesis of Nano metal-oxide using sol– gel process.
11. Determination of the capacity of the given cation-exchange Resin.
12. Measurement of viscosity by Redwood viscometer.

Duration: 3 Periods for each experiment
Total periods: 30

TEXT BOOKS:

1. **Physics Laboratory Manual**

2. K. Mukkanti, **"Practical Engineering Chemistry,"** BS Publications, 2013.

3. K.N. Jayaveera, K.B. Chandra Sekhar, **"Chemistry laboratory manual,"** S.M. Enterprises Limited, 2013.

B.Tech I Year
14BT1ES05: PROBLEM SOLVING & COMPUTER PROGRAMMING LAB
(Common to CSE,CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 3

PREREQUISITES: - - -

COURSE DESCRIPTION: This course deals with hands on experience in developing simple programs and implementing basic data structures – stack and queue, searching and sorting in C language.

COURSE OUTCOMES:
After the successful completion of the course, the student will be able to:
1. Select the appropriate data structure and algorithm design method for a specified problem.
2. Design, code, test, debug, and execute programs in C.
3. Implement and use common features found in C programs — arrays, pointers, strings, stacks and Queues.

List of Experiments:

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 evaluate 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. 5000 and <= 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 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 as input 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 is >3, then no grace marks are awarded. If the number of subjects failed is less than or equal to '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 less than or equal to '3' 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 equal to '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: $Sum=1-x^2/2!+ x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

    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 (Eg: 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 given 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 to convert a given octal number into binary form.

b. Write a program to convert a given decimal number into binary form.

c. Write a program to convert a given decimal number into octal form.

Week 12:

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 13:

Any number **x** is called colored number if it does not contain any substring **y** with the property that the product **z** of all the digits of **y** is not equal to

any of the substrings of **x** (for example, take x=263, then its substrings are 2,6,3,26,63,263 only. Now, take any substring y= 26 then z=2*6=12 or y=63 then z=6*3=18. Neither **z** is the substring of 263). Write a C program to check whether the given any three digit number is colored number or not.

Week 14:

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 15:

a. Write a program to read list of student names and perform the following operations using functions.

i)   to print list of names

ii)   to sort them in ascending order

iii) to print the list after sorting.

b. Write a menu driven program to read list of student names and perform the following operations using array of character pointers.

i)   to insert a student name

ii)   to delete a name

iii) to print the name

Week 16:

a. Two'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.
Eg: 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 (Eg: I,II,III...) in to its
decimal equivalent using functions

Week 17:
Write programs to perform the following using recursion
i) To find the factorial of a given integer.
ii)To solve Towers of Hanoi problem.

Week 18:
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 19:
a. Write a program to implement the following
i) Call by value
ii) Call by reference.
b. Write a program to swap the given two numbers without using
additional variable. (using pointers)

Week 20:
a. Write a program which copies one 'text file' to another 'text file'.
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 21:
Write a program to implement stack operations using arrays.

Week 22:
Write a program to implement linear queue operations using arrays.

Mini Project 1: Students are allowed to select a lab exercise, which
includes arrays, functions, pointer concepts and submit the report in Two
weeks.

Mini Project 2: Students are allowed to select a lab exercise, which
includes Structures, Files ,Stacks and Queues concepts and submit the
report in Two weeks.

REFERENCE BOOKS:

1. Behrouz A. Forouzan and Richard F. Gilberg, "**A Structured
Programming Approach using C,**" Third Edition, Cengage
Learning, New Delhi, 2007.

2. PradipDey and Manas Ghosh, "**Programming in C,**" Second
Edition, Oxford University Press, New Delhi, 2007.

B.Tech I Year
14BT1ES06: ENGINEERING & IT WORKSHOP
(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
25	50	75	-	-	3	3

PREREQUISITES: - - -

COURSE DESCRIPTION:

Engineering Workshop: The course provides hands-on training in the trades Carpentry, Fitting, House-wiring, Tin Smithy, Foundry. Overview of metal cutting processes, plumbing and welding is provided through live demonstrations.

IT Workshop: This course deals with practice sessions on PC hardware, Internet, World Wide Web, MS-Word, Excel, Power Point and Publisher. Demonstrations on installations of system software such as MS-Windows, Linux and device drivers, hardware and software troubleshooting, and protecting the personal computer from viruses and other cyber attacks are included.

COURSE OUTCOMES:

ENGINEERING WORKSHOP:

After the successful completion of the course, the student will be able to**:**

1. Utilize workshop tools for engineering practice.
2. Employ skills for the production of component for real time applications.
3. Appreciate the hard work and intuitive knowledge of the manual workers.

IT WORKSHOP:

After the successful completion of the course, the student will be able to**:**

1. Acquire analytical skills in:
   (a) Identification of functional parts of PC
   (b) Internet and World Wide Web.
   (c) Computer security issues and preventive measures.
   (d) Operating Systems.
2. Design document and presentations effectively.
3. Apply modern tools to develop IT based applications.
4. Gain effective communication skills through IT tools.
5. Update knowledge and skills in PC maintenance and usage of latest Operating Systems and Office automation tools.

List of Experiments:

ENGINEERING WORKSHOP:

1. Trades for Exercise:

Any <u>TWO</u> jobs from each trade should be performed.

a)	**Carpentry Shop**	:	Cross lap joint, mortise and tenon, T-joint, dove tail joint.
b)	**Fitting Shop**	:	Square fit and V-fit, semi circular fit, dove tail fit.
c)	**Sheet Metal Shop**	:	Trapezoidal tray, square tin, funnel, cylinder.
d)	**House wiring**	:	Wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp,

tube light connection, godown wiring.

(e) **Foundry**	:	Preparation of casting using single piece pattern, Preparation of casting using split piece pattern

2. Trades for Demonstration:
   a) **Welding**
   b) **Metal Cutting**
   c) **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, CDs/DVDs.

IT WORKSHOP:

a) PC Hardware

Week 1: Identify the peripherals of a personal computer, components in a Central Processing Unit (CPU) and its functions, block diagram of CPU along with the configuration of each peripheral.

Week 2: Demonstrating assembling and disassembling of the Personal Computer.

Week 3: Introduction to Operating Systems, Components of OS, Installation of Microsoft Windows-XP Operating System.

Week 4: Introduction to LINUX OS, Installation of LINUX OS, Basic DOS commands – mkdir, cd, cls, del, copy, attrib, date, path, type, format, exit. Basic commands in LINUX - cat, ls, pwd, rm, rmdir, cd, cp, mv, who, date, cal, clear, man, wc.

Week 5: Hardware & Software Troubleshooting: Diagnosis of PC malfunction, types of faults, common issues and how to fix them. Basic Hardware & Software Troubleshooting steps, PC diagnostic tools.

b) MS-Office:

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 word document in MS-Word using the features: Inserting tables, Bullets and numbering, Changing text direction, Hyperlink, Images from files and Clipart, Drawing toolbar and Word art.

Week 8: Create an invitation using Mail Merge in MS-Word

MS Power Point:

Week 9: Introduction to MS-Power Point, Utilities, Overview of toolbars, PPT orientation, slide layouts, Types of views.
Create a Power Point Presentation using the features: Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows.

Week 10: Create a Power Point Presentation using the features: Auto content wizard, Hyperlinks, Inserting images, Clip art, Audio, Video, Custom animation, Slide hiding, Tables and Charts.

MS Excel:

Week 11: 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 12: Create a spreadsheet using the features: Split cells, Sorting, Conditional formatting, Freeze panes, Pivot tables, Data validation.

MS Publisher & World Wide Web

Week 13: Introduction to MS-Publisher, Overview of toolbars, Saving files, Templates, Layouts.

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

Internet & Computer Security

Week 14: Search Engines and Cyber Hygiene: Introduction to computer networking, Demonstration on network components, Drivers loading and Configuration settings, Mapping of IP addresses, Configuration of Internet and Wi-Fi. Bookmarks, Search toolbars and pop up blockers. Types of search engines and how to use search engines, Awareness of various threats on Internet, Types of attacks and how to overcome. Installation of antivirus software, Configuration of personal firewall and Windows update on Computers.

Total Periods: *48*

REFERENCE BOOKS:
ENGINEERING WORKSHOP:
1. V. Ramesh Babu, **"Engineering Workshop practice,"** VRB Publishers Private Limited, 2009.
2. P.Kannaiah and K.L.Narayana, **"Workshop Manual,"** SciTech Publishers, 2009.
3. K. Venkata Reddy, **"Workshop Practice Manual,"** BS Publications, 2008.

IT WORKSHOP:
1. Vikas Gupta, "**Comdex Information Technology Course Tool Kit,"** Second Edition, WILEY Dreamtech, New Delhi, 2006.
2. ITL Education, "**Introduction to Information Technology,"** Second Edition, Pearson Education, New Delhi, 2005.
3. **"IT Workshop Laboratory Manual,"** Department of IT, SVEC, 2014.

B.Tech I Year
14BT1HS02: ENGLISH LANGUAGE COMMUNICATION SKILLS LABORATORY
(Common to All Branches of Engineering)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 3

PREREQUISITE: Basic Speaking and Listening Skills.

COURSE DESCRIPTION: The course contains practice sessions which are classified into software based learning, grammar and activities. English Speech Sounds and Phonemic Transcription, Word Stress and Sentence Stress, Accent, Rhythm and Intonation, Paralinguistic Features, Vocabulary Building, are aided by software. Grammar sessions include Functional Grammar: Tenses, Speech, Voice, Error Correction and Essay Writing. Just a Minute, Impromptu Speech and Elocution, Role Plays, Telephonic Etiquette, Listening Skills, Describing People, Places and Objects, Presentation Skills and Information Transfer are activity oriented.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**

1. Gain practical knowledge in
   - English Speech Sounds
   - Stress Patterns in word and sentence
   - Intonation Patterns
   - Paralinguistic Features
   - Vocabulary Enrichment
2. Analyse the functional part of the grammatical elements for writing grammatically correct English in various academic and personal practices.
3. Develop various language functions to fulfil the purpose of speaking and writing in academic, professional and personal contexts.
4. Apply the knowledge of the usage of various language software for enhancing the language skills more and more thereby acquiring unconsciously the language functions and elements that are commonly used in various contexts.
5. Communicate effectively with engineering community and society in various formal, informal and neutral situations.
6. Demonstrate various language functions by participating in
   - Just A Minute
   - Impromptu Speech
   - Elocution
   - Role Plays
   - Presentations
7. Engage in li felong learning for the de velopment of the communicative competence for meeting the global challenges.

Detailed list of Experiments / Lab practice Sessions:

1. English Speech Sounds and Phonemic Transcription
2. Word Stress and Sentence Stress

3. Accent, Rhythm and Intonation
4. Paralinguistic Features.
5. Vocabulary Building
   a. Importance of Vocabulary Enrichment in Speaking: Spelling
   b. Synonyms–Antonyms–Prefix–Suffixes–One Word Substitutes
   c. Idioms and Phrases–Homophones–Homonyms–Homographs.
6. Functional Grammar
   a. Parts of Speech
   b. Tenses
   c. Change of Speech
   d. Change of Voice
   e. Word Order and Error Correction
   f. Essay Writing
7. Just a Minute, Impromptu Speech and Elocution
8. Role Plays
9. Telephonic Etiquette
10. Listening Skills
11. Describing People, Places and Objects
12. Presentation Skills
13. Information Transfer

REFERENCES:
1. Departmental Lab Manual

SUGGESTED SOFTWARE:
1. Mastering English: Vocabulary, Grammar, Punctuation and Composition.
2. Dorling Kindersley Series of Grammar, Punctuation, Composition etc.
3. Language in Use 1, 2 and 3
4. Learning to Speak English 8.1, the Learning Company – 4 CDs.
5. English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.
6. English Pronunciation Dictionary by Daniel Jones
7. Speech Solutions
8. Cambridge Advanced Learner's Dictionary - 3rd Edition
9. Centronix - Phonetics
10. Rosetta Stone
11. Let's Talk English, Regional Institute of English South India.

II B.Tech. I Semester
14BT3BS03: PROBABILITY AND STATISTICS
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Engineering Mathematics"
COURSE OUTCOMES:
After the successful completion of the course, the student will be able to**:**
1. Demonstrate basic knowledge on
   (a) Probability distributions, correlation and regressions.
   (b) Statistical quality control and testing of hypotheses.
   (c) Finding regression coefficients ,elucidating relationships in bi-variate data.
   (d) Tests of significance for small and large samples.

2. Develop analytical skills in providing solutions for the problems involving
   (a) means, probability distributions and standard deviations
   (b) sampling techniques for decision making in uncertain environments
   Develop skills for analyzing the data with
   (a) Suitable tests of significance for practical situations.
   (b) Through probability distributions for practical situations.
3. Develop skills in applying
   (a) Statistical techniques employed for quality control and maintenance of uniform quality in the manufacturing processes.

Detailed Syllabus:

UNIT – I: PROBABILITY & MATHEMATICAL EXPECTATIONS
(09 periods)

Probability- Conditional probability. Bayes 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   (09 periods)
Discrete Distributions: Binomial Distribution, Mean and Standard Deviations of Binomial Distribution, Poisson distribution, Mean and Standard Deviations of Poisson Distribution.
Continuous Distributions: Normal Distribution, Mean, Variance and area properties.

UNIT – III: STATISTICAL QUALITY CONTROL AND CORRELATION-REGRESSION   (09 periods)
Introduction, Advantages and limitations of statistical quality control, Control charts, specification limits, X , R, p, np and c charts. Definition of correlation, correlation coefficient, Rank correlation. Simple linear regression, regression lines and properties.

UNIT – IV: SAMPLING DISTRIBUTIONS AND TESTS OF SIGNIFI-CANCE FOR LARGE SAMPLES   (09 periods)

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. Test of Significance for Single Proportion, Difference of Proportions, Single Mean, Difference of Means.

UNIT – V: STESTS OF SIGNIFICANCE FOR SMALL SAMPLES
(09 periods)

Student's t-test: single mean, difference of means, F-test for equality of population variance, Chi-Square Test for Goodness of fit, contingency table, Chi-Square Test for Independence of Attributes.

Total Periods: 45

TEXT BOOKS:
1. T.K.V. Iyengar, B. Krishna Gandhi..etal., **"Probability and Statistics,"** S. Chand & Company, Third Edition, 2011.
2. S.P.Gupta, **"Statistical Methods,"** Sultan and Chand, New Delhi, Thirty Fourth Edition, 2005.

REFERENCE BOOKS:
1. Shahnaz Bathul, **"A text book of Probability and Statistics,"** Ridge Publications, Second Edition.
2. S.C.Gupta and V.K.Kapoor, **"Fundamentals of Applied Statistics,"** Sultan and Chand, New Delhi. 1998.

II B.Tech. I Semester
14BT31201: DISCRETE MATHEMATICAL STRUCTURES
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Engineering Mathematics".

COURSE DESCRIPTION: Mathematical Logic; Predicates; Relations; Algebra Structures; Mathematical Reasoning; Recurrence Relations; Graphs; Graph Theory and its applications.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on mathematical logic, algebraic structures, relations, recurrence relations and mathematical reasoning.

2. Analyze and prove given statement by contradiction and automatic theorem.

3. Design network applications using Prim's and Kruskal's algorithms.

4. Apply the concepts of graph theory, permutation, combinations, counting principle and graph theory in solving real-time problems.

Detailed Syllabus:

UNIT – I: MATHEMATICAL LOGIC AND PREDICATES (11 periods)

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

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

UNIT – II: FUNCTIONS AND RELATIONS   (09 periods)

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 – III: ALGEBRAIC STRUCTURES   (06 periods)

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

UNIT – IV: MATHEMATICAL REASONING AND RECURRENCE RELATIONS   (10 periods)

Mathematical Reasoning: Methods of Proof, Mathematical Induction, Basics of counting, The Inclusion- Exclusion Principle, The Pigeon hole principle, Permutations and Combinations, Generalized Permutations and Combinations.

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 – V: GRAPH THEORY AND ITS APPLICATION   (09 periods)

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.

Trees: 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.

Total Periods: 45

TEXT BOOKS:

1. J.P. Trembly and R. Manohar, **"Discrete Mathematical Structures with Applications to Computer Science,"** Tata McGraw Hill, 2001.

2. Ke nneth H. R osen, **"Dis crete Mathematic s and its Applications,"** Tata McGraw Hill, Sixth Edition, 2007.

REFERENCE BOOKS:

1. Joe L.Mott and Abraham Kandel, **"Discrete Mathematics for Computer Scientists and Mathematicians,"** Prentice Hall of India Private Limited, Second Edition, 2004.

2. Ralph P. Grimaldi and B.V.Ramana, **"Discrete and Combinatorial Mathematics- an Applied Introduction",** Pearson Education, Fifth Edition, 2006.

II B.Tech. I Semester
14BT30235: BASIC ELECTRICAL ENGINEERING
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Engineering Physics".

COURSE DESCRIPTION: Basics of electrical circuits and measuring instruments, principle of operation, characteristics and applications of DC machines, transformers, three phase induction motors and special machines.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on

   a) Basics of electrical circuits.

   b) Construction and working principle of various electrical machines and various measuring instruments.

2. Analyze the behavior of electrical circuits and operation of several electrical measuring instruments.

3. Develop skills to evaluate various circuit parameters and performance characteristics of various machines.

Detailed Syllabus:

UNIT - I: ELECTRICAL CIRCUITS   (13 periods)

Essence of electricity, basic circuit components, electric current, potential difference, EMF, electric power, Ohm's law, resistive networks, inductive networks, capacitive networks, Kirchhoff's laws, series-parallel circuits, star to delta and delta to star transformations. Mesh analysis, nodal analysis, source transformation technique, numerical problems.

UNIT - II: ALTERNATING QUANTITIES   (09 periods)

Principle of AC voltages, wave forms and basic definitions, RMS and average values of alternating currents and voltages for sinusoidal waveform, form factor and peak factor, power factor and concept of power triangle.

Polyphase systems, advantages, voltages and currents in balanced star and delta connections, numerical problems, advantages of star and delta connections.

UNIT - III: DC MACHINES   (09 periods)

DC Generators-constructional details, principle of operation, EMF equation, types and applications.

DC Motors - principle of operation, significance of back EMF, types, torque equation, losses, efficiency and applications.

UNIT - IV: AC MACHINES   (Periods: 08)

Transformers - principle of operation, constructional details, losses, efficiency and regulation.

Three phase Induction motors -constructional details, operatingprinciple and applications.

Principle of operation and applications-splitphase induction motors, AC servomotor and stepper motor.

UNIT - V: MEASURING INSTRUMENTS AND SPECIAL APPARATUS
(Periods:06)

Classification of instruments, operating principles, essential features of measuring instruments, permanent magnet moving coil and moving iron instruments (voltmeters and ammeters), digital multi-meters, voltage stabilizers, uninterruptible power supply (UPS).

Total Periods: 45

TEXT BOOKS:

1. V.K.Mehta, Rohit Mehta, **"Principles of Electrical Engineering,"** S. Chand and Company Ltd., New Delhi, 2006.

2. T.K. Nagasarkar, M.S. Sukhija, **"Basic Electrical Engineering,"** Oxford University Press, New Delhi, 2010.

REFERENCE BOOKS:

1. B.L. Theraja, A.K. Theraja, **"A text book of Electrical Technology in SI Units,"** Vol.2, S.Chand and Company Ltd., New Delhi, 2013.

2. D P Kothari, I J Nagarath, **"Basic ElectricalEngineering,"** Third Edition Tata McGraw Hill Education private Limited, New Delhi, 2012.

3. Ali Emadi, AbdolhoseinNasir i, Stoyan B. Be kiar ov, **"Uninterruptible Power Supplies and Active Filters,"** CRC Press, USA, 2005.

4. R.K.Rajput, **"Basic Electrical and Electronics Engineering,"** Laxmi Publications (P) Ltd., New Delhi, 2007.

II B.Tech. I Semester
14BT30431: ELECTRONIC DEVICES AND CIRCUITS
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Engineering Physics".

COURSE DESCRIPTION: Characteristics of general and special purpose electronic devices; Rectifiers and regulators; Biasing and small signal analysis of BJT and FET, Feedback Amplifiers, Oscillator.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in
   a) P-N junction diode, Zener diode and their characteristics.
   b) Rectifiers, Filters and Regulators.
   c) Characteristics of BJT, FET, MOSFET and special purpose electronic devices.
   d) Amplifiers and Oscillators.
2. Analyze numerical and analytical problems in
   a) Regulated Power Supply,
   b) Transistor biasing circuits,
   c) Transistor amplifiers,
   d) Feedback amplifiers and,
   e) Oscillators,
3. Design the electronic circuits like
   a) Transistor biasing circuits,
   b) Transistor amplifiers,
   c) Feedback amplifiers and,
   d) Oscillators.
4. Solve engineering problems and arrive at solutions pertaining to Electronic circuits.

Detailed Syllabus:

UNIT - I: DIODE, RECTIFIERS AND REGULATORS (11 periods)

PNJUNCTION 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.

RECTIFIERS AND REGULATORS:

Halfwave rectifier and Fullwave rectifiers (Qualitative and quantitative analysis), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L - section filter, n - 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 - II: BIPOLAR JUNCTION TRANSISTOR   (11 periods)

CHARACTERISTICS:

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.

BIASING:

Transistor biasing, Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias.

AMPLIFIER:

BJT Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics,

Measurement of h-Parameters, Analysis of CE, CB and CC configurations using simplified Hybrid Model. Comparison of CB, CE and CC configurations.

UNIT - III: FIELD EFFECT TRANSISTOR   (09 periods)

Construction, Principle of Operation and Characteristics of JFET and MOSFET (Enhancement & Depletion), Biasing of FET, Small Signal Model of JFET & MOSFET. Common Source and Common Drain Amplifiers using FET, Generalized FET Amplifier, FET as Voltage Variable Resistor, Comparison between BJT and FET.

UNIT - IV: FEEDBACK AMPLIFIERS AND OSCILLATORS (07 periods)

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 - V: SPECIAL PURPOSE ELECTRONIC DEVICES (07 periods)
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.

Total Periods: 45

TEXT BOOKS:

1. Millman, Christos C. Halkias and Satyabrata Jit, **"Electronic Devices and Circuits,"** TMH, Third Edition, 2010.

REFERENCE BOOKS:

1. R.L. Boylestad and Louis Nashelsky, **"Electronic Devices and Circuits,"** PHI, Tenth Edition, 2009.

2. S. Salivahana, N. Suresh Kumar, **"Electronic Devices and Circuits,"** Mc-Graw Hill, Third Edition, 2008.

3. David A. Bell, **"Electronic Devices and Circuits,"** Oxford University press, Fifth Edition, 2008.

II B.Tech. I Semester
14BT30501: DATA STRUCTURES
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Problem Solving and Computer Programming".

COURSE DESCRIPTION: Concepts of Data Structures- Linked Lists, Stacks, Queues, Trees Graphs, Sorting, and Hashing.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**
1. Gain Knowledge in
    • Principles of Data Structures.
    • Abstract Data Type.
    • Linear and Non-linear Data Structures.
2. Analyze and identify suitable data structure design techniques for problem solving.
3. Develop programs to implement linear and non linear data structures.

Detailed Syllabus:

UNIT - I: LINKED LISTS   (09 periods)

Linked Lists: Introduction To Data Structures, Pointers, Basic Operations, Implementation, Application, Circular Linked Lists, Doubly Linked List.

UNIT - II: STACKS AND QUEUES   (08 periods)

Stacks: Basic Stack Operations, Stack Linked List, Implementation, Stack Applications.

Queues: Queue Operations, Queue Linked List Design, Queue Applications.

UNIT - III: TREES, SEARCH TREES, AND HEAPS   (10 periods)

Trees: Basic Tree Concepts, Binary Trees.

Binary Search Trees (BST): Basic Concepts, BST Operations, BST Applications.

AVL Search Trees: Basic Concepts, AVL Tree Implementations.

Heaps: Basic Concepts, Heap Implementation, Heap Application.

UNIT - IV: MULTIWAY TREES AND GRAPHS   (09 periods)

Multiway Trees: B-Trees, Simplified B-Trees, B-Tree Variations.

Graphs: Basic Concepts, Operations, Graph Storage Structures.

Graph Algorithms: Create Graph, Insert Vertex, Delete Vertex, Retrieve Vertex, Depth-first Traversal, Breadth-first Traversal.

UNIT - V: SORTING AND HASHING   (09 periods)

Sorting: Sorting by Exchange-Shell Sort, Quick Sort. Sorting By

Distribution-Counting Sort, Bucket Sort, Radix Sort. Sorting By Merging-Merge Sort.

Hashing: Introduction, Hash Table Structure, Hash Functions, Linear Open Addressing, Chaining, Applications.

Total Periods: 45

TEXT BOOKS:

1. Richard Gileberg, Behrouz A. Forouzan, **"Data Structures: A Pseudocode Approach with C,"** Second Edition, 2007.

2. Debasis Samanta, **"Classic Data Structures,"** PHI Learning, Second Edition, 2009.

REFERENCE BOOKS:

1. G.A.V. Pai, **"Data Structures and Algorithms,"** Tata McGraw Hill, Second Edition, 2009.

2. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J.Augenstein, **"Data Structures Using C,"** Pearson Education, 2005.

II B.Tech. I Semester
14BT30502: DIGITAL LOGIC DESIGN
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil

COURSE DESCRIPTION: Introduction to number systems; logic gates; simplification of Boolean functions; Design of combinational circuits; Design of sequential circuits, Memory and Programmable Logic.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to**:**
1. Gain knowledge on Boolean algebra, Minimization of Boolean functions using Map method.
2. Design combinational and sequential logic circuits for digital systems.
3. Apply simplification techniques for simplifying Boolean functions.

Detailed Syllabus:

UNIT - I: BINARY SYSTEMS AND BOOLEAN ALGEBRA   (09 periods)

Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, Signed binary numbers, complements, Boolean Algebra, Boolean functions, Canonical and standard forms, Digital logic gates.

UNIT - II: GATE LEVEL MINIMIZATION   (09 periods)

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.

UNIT - III: COMBINATIONAL LOGIC   (09 periods)

Combinational Circuits, Analysis procedure, Design procedure, Binary Adder-Subtractor, BCD Adder, Binary multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, De-Multiplexers.

UNIT - IV: SEQUENTIAL LOGIC   (09 periods)

Latches, Flip-Flops, Analysis of clocked sequential circuits, Design of synchronous sequential circuits, registers, shift registers, Ripple counters, Synchronous counters, Ring Counter and Johnson Counter.

UNIT - V: MEMORY AND PROGRAMMABLE LOGIC   (09 periods)

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

Total Periods: 45

TEXT BOOK:

1. M. Morris Mano, **"Digital Design,"** Third Edition, Pearson

Education/PHI, 1999.

REFERENCE BOOKS:

1. David J Comer, **"Digital Logic & State Machine Design,"** Third Edition, Oxford University Press, 2012.

2. Charles H.Roth Jr, **"Fundamentals of Logic Design,"** Fifth Edition, Cengage Learning, 2008.

II B.Tech. I Semester
14BT30422: ANALOG AND DIGITAL ELECTRONICS LAB
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PREREQUISITES: Courses on "Electronic Devices & Circuits and Digital Logic Design".

COURSE DESCRIPTION: Identification and testing of active and passive components; RPS, DMM, Function Generator, CRO; Diode characteristics; Rectifiers; BJT and FET characteristics; UJT and SCR characteristics; BJT amplifiers; Realization of FFs, Combinational Circuits, sequential Circuits; Demonstration on VHDL Programme.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Analyze the characteristics of different electronic devices and circuits like
   - Diodes-PN Junction Diodes, Zener Diodes, SCR
   - Transistors-BJT,FET,UJT
   - Flip Flops-JK FF,DFF
   - Combinational Circuits-HA,FA
   - Sequential Circuits -Counters
2. Design and analyze the electronic circuits like BJT Amplifiers, Oscillators, Combinational Circuits and Sequential Circuits.
3. Solve engineering problems by proposing potential solutions leading to Design of better electronic circuits.

List of Experiments:

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 C onde nser s, R elays, Bread Boards. I dentification, 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 Program

II B.Tech. I Semester
14BT30521: DATA STRUCTURES LAB
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	**50**	**75**	**- - 3 2**

PREREQUISITES: A course on "Problem Solving and Computer Programming".

COURSE DESCRIPTION: Hands-=on programming on concepts of data structures - Linked lists, Stacks, Queues, Trees, Search trees, Sorting, and Hashing.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate practical knowledge on C Programming and Linear and Non-Linear Data Structures.
2. Analyze and identify suitable data structure techniques to solve problems.
3. Develop programs to implement linear and non linear data structures.

List of Experiments:

1. Write program to implement the following data structures:

   (a) Single linked list.   (b) Double linked list.

   (c) Circular linked list.

2. Write a program to implement stack and queue using linked list.

3. Write a program to evaluate a given postfix expression using stack.

4. Write a program to convert a given infix expression to postfix form using stacks.

5. Write a program to implement

   (a) stack using two queues. (b) queue using two stacks.

6. Write a program to implement In-order, pre-order, post-order tree traversal of binary trees.

7. Write a program to perform operations on a binary search tree(BST) .

8. Write programs for implementation of graph traversals by applying:

   (a) Breadth First Search. (b) Depth First Search.

9. Implement the following sorting algorithms:

   (a) Merge sort. (b) Heap sort. (c) Quick Sort. (d) Radix Sort.

10. Write a program to implement hashing with

    (a) Separate Chaining (b) Open addressing methods.

REFERENCE BOOKS:

1. Richard Gileberg, Behrouz A. Forouzan, **"Data Structures: A Pseudocode Approach with C,"** Second Edition, 2007.

2. Debasis Samanta, **"Classic Data Structures",** Phi Learning, Second Edition, 2009.

II B.Tech. II Semester
14BT3HS01: ENVIRONMENTAL SCIENCES
(Common to CSE, CSSE, IT, CE and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Engineering Physics and Engineering Chemistry".

COURSE DESCRIPTION: Introduction to environment, Need for public awareness; Natural resources, conservation and management; Ecology and ecosystems; Biodiversity, conservation and management; Environment pollution and Control; Social issues and environment; Human population and environment; Field study and analysis.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on
   a) Diverse components of environment and natural resources
   b) Ecosystem and biodiversity & its conservation methods
   c) Population growth and human health
   d) Green technology
2. Identify and resolve the issues related to sources of different types of pollutions.
3. Provide solutions to individuals, industries and government for sustainable development of natural resources.
4. Create awareness on environmental degradation and to bring best management practices to protect environment.
5. Develop skills in analyzing reports on environment for sustainable development.
6. Apply environmental ethics in protection of diversified ecosystems.

Detailed Syllabus:

UNIT - I: MULTIDISCIPLINARY NATURE OF ENVIRONMENT AND NATURAL RESOURCES   (11 periods)

Multidisciplinary nature of environment: Definition, scope and importance of multidisciplinary nature of environment, segments of environment-lithosphere, hydrosphere, atmosphere and biosphere, need for public awareness.

Natural Resources: Renewable and Non-renewable resources and associated problems- (a) forest resources: use and over exploitation, deforestation-causes, effects and remedies, case studies, (b) water resources-use and over utilization of surface & ground water, conflicts over water-benefits and problems of large dams, case studies, (c) mineral resources- mining, adverse effects, case studies, (d) food resources-world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problem, water logging and salinity, case studies, (e) energy resources-growing needs, renewable energy resources-solar, wind, hydropower, hydrogen fuel and non-renewable

energy resources-coal, natural gas, nuclear energy, role of an individual in conservation of natural resource and equitable use of resources for sustainable lifestyles.

UNIT - II: ECOSYSTEMS AND BIODIVERSITY   (10 periods)

Ecosystems: Definition and concept of an ecosystem, structure and function of an ecosystem-producers, consumers and decomposers, food chains, food webs and e cological pyramids-introduction, types, characteristic features, structure and functions of forest ecosystem, desert ecosystem, aquatic ecosystem-ponds, lakes & oceans, energy flow in the ecosystem, ecological succession.

Biodiversity: Definition, concept and value of biodiversity, role of biodiversity in addressing new millennium challenges, hot spots of biodiversity, threats to biodiversity-habitat loss, poaching of wildlife, man-wild life conflicts, endemic, endangered and extinct species of India, conservation of biodiversity-in-situ and ex-situ.

UNIT - III: ENVIRONMETAL POLLUTION AND CONTROL (08 periods)

Definition, causes, adverse effects and control measures of: (a) air pollution (b) water pollution (c) soil pollution (d) noise pollution (e) thermal pollution (f) nuclear pollution, solid waste management-causes, effects and control measures of urban and industrial wastes, hazar ds and disaster management-floods, earthquakes, tsunamis, case studies.

UNIT - IV: SOCIAL ISSUES AND THE ENVIRONMENT   (08 periods)

From unsustainable to sustainable development, urban problems related to energy, environmental ethics-issues and possible solutions, global warming, acid rain, ozone layer depletion, nuclear accidents and case studies, wasteland reclamation, consumerism and waste products, environment protection act, air (prevention and control of pollution) act, water (prevention and control of pollution) act, wildlife protection act, forest conservation act, issues involved in enforcement of environmental legislation, public environmental awareness.

UNIT - V: HUMAN POPULATION AND THE ENVIRONMENT
(08 periods)

Population growth, population characteristics and variation among nations, population explosion, family welfare programme, environment and human health, human rights, value education, HIV/AIDS, women and child welfare, role of information technology in environment and human health, case studies.

Field work: visit to a local area to document environmental assets-pond/forest/grassland/hill/mountain/Environment Impact Assessment procedures for local environmental issues or assignment/seminar.

Total periods: 45

TEXT BOOKS:

1. A.Kaushik and C.P. Kaushik, **"Environmental Studies,"** New Age International (P) Ltd Publications, Fourth Edition, 2014.

2. Erach Barucha, **"Environmental Studies,"** Orient Blackswan, Second Edition, 2013.

REFERENCE BOOKS:

1. R. Rajagopalan, **"Environmental Studies,"** Oxford University Press, Second Edition, 2011.

2. Benny Joseph, **"Environmental Studies,"** Tata McGraw-Hill, Second Edition, 2009.

3. Dr. B S Chauhan, **"Environmental Studies,"** University Science Press, First Edition, 2008.

4. M. Anji Reddy, **"Textbook of Environmental Sciences and Technology,"** BS Publications, 2007.

5. Larry W Canter, **"Environmental Impact Assessment,"** McGraw-Hill Education, Second Edition, 1996.

II B.Tech. II Semester
14BT4HS01: BUSINESS COMMUNICATION AND PRE-SENTATION SKILLS
(Common to CSE, CSSE, IT, CE and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Basic grammar and fundamentals of Listening, Speaking, Reading and Writing skills"

COURSE DESCRIPTION: Nature and Scope of Communication; Non-Verbal Communication; Writing Business Documents; Business Presentations and Public Speaking; Careers and Résumé.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in
   a) Managerial Communication
   b) Corporate Communication
   c) Business Writing
   d) Presentation Skills
   e) Career Building
2. Analyze and judge the situation through non-verbal communication for effective organizational communication.
3. Achieve personal excellence and ability to work in groups.
4. Develop effective communication to meet professional needs.

Detailed Syllabus:

UNIT - I: NATURE AND SCOPE OF COMMUNICATION (09 periods)

Introduction - Functions of Communication - Roles of a Manager - Communication Basics - Communication Networks - Informal Communication - Tips for Effective Internal Communications - Interpersonal Communication - Communication Barriers - Effective Managerial Communication - Strategies for Improving Organizational Communication.

UNIT - II: NON-VERBALCOMMUNICATION   (09 periods)

Introduction - Significance of Non-verbal Communication in Organizations - Forms of Non-verbal Communication - Types of Non-verbal Communication - Cross Cultural Communication: Introduction - Concept of Cross cultural Communication - Different Communication Styles - Cross-cultural Communication Strategies - Corporate Communication: Introduction - Crisis Management / Communication - Case Study.

UNIT - III : WRITING BUSINESS DOCUMENTS   (10 periods)

Business Writing: Introduction - Importance of Written Business Communication - Five Main Stages of Writing Business Messages; Business Letter Writing: Common Components of Business Letters - Strategies for Writing the Body of a Letter - Kinds of Business Letters; Business Reports - Kinds of Reports - Characteristics of Business Reports - Steps in Writing a Routine Business Report - Corporate Reports.

UNIT - IV : BUSINESS PRESENTATIONS AND PUBLIC SPEAKING

(10 periods)

Introduction - Business Presentations Speeches - Introduction to a presentation - Main Body - Conclusion - Effective Sales Presentations - Case Study; Group Discussions: Introduction - Work Place GD Guidelines - Functional and Non-functional Roles in Group Discussions; Team Presentations: Benefits of Team Presentations - Purpose of Team Presentations - Case Studies.

UNIT - V : CAREERS AND RESUME **(07 periods)**

Introduction - Career Building: Understanding Yourself - Setting a Career Goal - Résumé Writing: Résumé Formats; Interviews: Introduction - Fundamental Principles of Interviewing - General Preparation for an Interview - Success in an Interview - Types of Interviewing Questions - Important Non-verbal Aspects - Types of Interviews - Styles of Interviewing - Case Interviews.

Total Periods: 45

TEXT BOOK:

1. Me enak shi Raman and Pr ak ash Singh, **" Busines s Communication,"** Oxford University, Press, New Delhi, Second Edition, 2012.

REFERENCE BOOKS:

1. M K Se hgal and Vandana Khe tarpal, **"B us ines s Communication,"** Excel Books, New Delhi, 2011.

2. M Ashraf Rizvi, **"Effective Technical Communication,"** Tata McGraw-Hill, 2009.

II B.Tech. II Semester
14BT41201: OBJECT ORIENTED PROGRAMMING
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L	T P C
30	70	100	3	1 - 3

PREREQUISITES: A course on "Problem Solving and Computer Programming".

COURSE DESCRIPTION: Object Oriented Concepts; Basics of Java; Polymorphism; Inheritance and Interfaces; Exception Handling; Multithreading; Event Handling, Applets, AWT, Database Connectivity and Servlets.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate Knowledge on:
   - Object Oriented Programming concepts - classes, objects, inheritance, polymorphism, encapsulation and abstraction.
   - Packages, interfaces, multithreading, exception handling, event handling.
2. Apply AWT and Applets to design and develop interactive Graphical User Interfaces.
3. Gain problem solving skills to provide effective solutions for real world problems.

Detailed Syllabus:

UNIT - I: OBJECT ORIENTED THINKING   (09 periods)

Need for OOP paradigm, OOP concepts

History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting.

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 - II: INHERITANCE, PACKAGES AND INTERFACES
(09 periods)

Understanding Inheritance: Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance,

costs of inheritance. Member access rules, using super, Creating multi-level hierarchy, Method overriding, abstract classes, using final with inheritance.

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

Interfaces: Defining an interface, implementing interface, applying

interfaces, variables in interface and extending interfaces.

UNIT - III: EXCEPTION HANDLING AND MULTITHREADING
(09 periods)

Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Java thread model, thread life cycle, creating threads, thread priority, synchronizing threads, inter thread communication.

UNIT - IV: APPLETS, EVENT HANDLING AND AWT   (09 periods)

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.

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 - V: JDBC and SERVLETS   (09 periods)

Database Connectivity: Loading the driver, Establishing connection, Create statement, Execute query, Iterate result set, Scrollable Results, and Transactions.

Servlets: The Life Cycle of a Servlet, Using Tomcat for Servlet Development, Create and Compile the Servlet Source Code, Start Tomcat, Start a Web Browser and Request the Servlet, The Servlet API, The Javax.Servlet Package, The javax.Servlet.http Package.

Total Periods: 45

TEXT BOOKS:

1. Herbert Schildt, **"Java the complete reference,"** TMH, Seventh Edition, 2007.

2. Timothy Budd, **"U nd erstanding Ob ject-oriented Programming with Java,"** Addison-Wesley, Updated Edition, 2002.

REFERENCE BOOKS:

1. Sachin Malhotra, Saurab Choudhary, **"Programming in java,"** Oxford university press, Second Edition, 2014.

II B.Tech. II Semester

14BT40432: DATA COMMUNICATIONS

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Engineering Physics".

COURSE DESCRIPTION: Fundamentals of data communication; Transmission media; Digitization techniques - PCM; Multiplexing; Telephone circuit concepts; Cellular Telephone concepts; Channel coding.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in:
   - Understanding the concepts of data communication
   - Modulation and Demodulation of signals.
   - Metallic and optical fibre transmission.
   - Digital transmission
   - Data communication codes and formats
2. Analyze engineering problems critically in the domain of data communications and systems.
3. Solve engineering problems in data communications domain.

Detailed Syllabus:

UNIT - I: FUNDAMENTALS OF DATA COMMUNICATION

(09 periods)

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: TRANSMISSION MEDIA   **(09 periods)**

Metallic Transmission Lines, 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, Ele ctromagnetic spectr um, Optical Fiber

Communications System Block Diagram, Optical Fiber construction, 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   **(09 periods)**

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, Statistical Time - Division Multiplexing, Frame Synchronization, Introduction to Frequency Division Multiplexing and Wavelength- Division Multiplexing.

UNIT - IV: TELEPHONE INSTRUMENTS AND SIGNALS (08 periods)

The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Call Progress Tones and Signals, Cordless Telephones, Caller ID, Introduction to Electronic Telephones and Paging systems.

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 - V: CELLULAR TELEPHONE CONCEPTS   (10 periods)

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.

Data Communications Codes, Error Control, Data Formats:

Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.

Total Periods:45

TEXT BOOK:

1. Wayne Tomasi, **"Introduction to Data Communications and Networking,"** Pearson Education, 2005.

REFERENCE BOOKS:

1. Be hr ouz A Forouzan, **" Data Communications and Networking,"** TMH, Fourth Edition, 2006.

2. Fred Halsall, **"Data Communications, Computer Networks and Open Systems,"** Pearson Education, Fourth Edition, 1999.

II B.Tech. II Semester

14BT40501: COMPUTER ORGANIZATION

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Digital Logic Design".

COURSE DESCRIPTION: Basic structure of a digital computer, organization of the arithmetic, and logical unit, control unit, memory and I/O unit.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
   - Computer Arithmetic and Register Transfer Language.
   - Microprogrammed Control Unit
   - Input Output Organization and Memory system
   - Pipelining, Multiprocessors and interconnection structures.
2. Analyze functioning of Central Processing Unit.
3. Design the Microprogrammed Control Unit, Memory and I/O.

Detailed Syllabus:

UNIT - I: COMPUTER ARITHMETIC, REGISTER TRANSFER LANGUAGE & MICROOPERATIONS   (09 periods)

Computer Arithmetic: Data Representation, Fixed Point Representation, Floating Point Representation, Addition and subtraction, Binary multiplication Algorithms, Binary Division Algorithms, Floating point Arithmetic operations.

Register Transfer Language And Microoperations: Register Transfer, Bus and memory transfers, Arithmetic Microoperations, Logic micro operations, Shift micro operations, Arithmetic logic shift unit.

UNIT - II: BASIC COMPUTER ORGANIZATION AND DESIGN, MICRO PROGRAMMED CONTROL   (09 periods)

Basic Computer Organization And Design: Instruction codes, Computer Registers, Computer instructions, Timing and control, Instruction cycle, Memory Reference Instructions, Input - Output and Interrupt.

Micro Programmed Control: Control memory, Address sequencing, Design of control unit, Hard wired control, Micro-programmed control.

UNIT - III: INPUT–OUTPUT ORGANIZATION   (09 periods)

Input-Output Organization: Peripheral Devices, Input-Output Interface, Modes of Transfer, Priority Interrupt, Direct memory Access, Input -Output Processor (IOP), Serial communication, Introduction to Peripheral Component Interconnect (PCI) bus.

UNIT - IV: THE MEMORY SYSTEM   (09 periods)

The Memory System: Semiconductor RAM memories, Read-only memories, Cache memory, Performance considerations, Virtual memory, Secondary storage.

UNIT - V: PIPELINE & VECTOR PROCESSING AND MULTI PROCESSORS
(09 periods)

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline ,Vector Processing, Array Processors.

Multiprocessors: Characteristics of Multiprocessors, Interconnection Structures, Inter-processor Arbitration, Inter-Processor Communication and Synchronization.

Total Periods: 45

TEXT BOOKS:

1. Morris Mano, **"Computer System Architecture,"** Third Edition, Pearson Education, New Delhi.

2. Carl V Hamacher, Zvonko G. Varanesic and Safat G. Zaky, **"Computer Organisation,"** Fifth Edition, McGraw-Hill, New Delhi.

REFERENCE BOOKS:

1. W. Stallings, **"Computer Organization and Architecture Designing For Performance,"** Eighth Edition, Prentice Hall, India, 2012.

2. John P.Hayes, **"Computer architecture and Organisation,"** Third Edition, Tata McGraw-Hill.

II B.Tech. II Semester
14BT40502: **DATABASE MANAGEMENT SYSTEMS**
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Data Structures".

COURSE DESCRIPTION: Introduction to Database Systems; Database Design; Relational Model; SQL Quries, Constraints and Triggers; Schema Refinement and Normal Forms; Transaction Management; Concurrency Control; Overview of Storage and Indexing.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on:
   - Fundamentals of DBMS
   - Database design
   - Normal forms
   - Storage and Indexing
2. Apply Structured Query Language (SQL) in retrieval and management of data in real time applications.
3. Develop skills in designing, managing databases and its security.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO DATABASE SYSTEMS&DATABASE DESIGN (09 periods)

Introduction to Database Systems: Database System Applications, Purpose of Database Systems, View of Data-Data Abstraction, Instances and Schemas, Data Models, Database Languages-DDL,DML, Database Architecture, Database Users and Administrators.

Introduction to Database design: ER diagrams, Beyond ER design, Entities, Attributes and Entity Sets, Relationships and Relationship sets, Additional features of ER model, Conceptual Design with the ER model.

UNIT - II: THE RELATIONAL MODEL&RELATIONAL ALGEBRA AND CALCULUS (08 periods)

Relational Model: Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical database Design, 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 - III: SQL & SCHEMA REFINEMENT (10 periods)

SQL: Form of Basic SQL Query- Examples of Basic SQL Queries, Introduction to Nested Queries, correlated Nested Queries, Set- Comparison Operators, Aggregate Operators, NULL values-Comparison using Null values- Logical

connectives- AND, OR and NOT- Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL ,Triggers and Active Databases.

Schema Refinement: Problems Caused by redundancy Decompositions - Problem related to decomposition, Functional Dependencies- Reasoning about FDS, Normal Forms - FIRST, SECOND, THIRD Normal forms- BCNF, Multi valued Dependencies- FOURTH Normal Form, Join Dependencies, FIFTH Normal form.

UNIT - IV: TRANSACTIONS AND CONCURRENCY CONTROL

(09 periods)

Transactions: Transaction Concept- Transaction State- Implementation of Atomicity and Durability- Concurrent Executions- Serializability- Recoverability - Implementation of Isolation - Testing for serializability.

Concurrency Control: Lock Based Protocols - Timestamp Based Protocols- Validation Based Protocols - Multiple Granularity, Deadlock Handling.

UNIT - V: STORAGE AND INDEXING (09 periods)

Storage and Indexing: Data on External Storage, File Organization and Indexing - Clustered Indexes, Primary and Secondary Indexes, Index data Structures - Hash Based Indexing, Tree based Indexing, Comparison of File Organizations.

Tree Structured Indexing: Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

Total Periods: 45

TEXT BOOKS:

1. Raghu Ramakr ishnan, Johannes Gehrk e, **"Datab as e Management Systems,"** Tata McGraw Hill, Third Edition, 2007.

2. A.Silberschatz, H.F.Korth, S.Sudarshan,**"Database System Concepts,"** Tata McGraw hill , Fifth Edition, 2005.

REFERENCE BOOKS:

1. RamezElmasri,, Shamkant B.Navathe, **"Database Systems,"** Sixth Edition, Pearson Education, 2013.

    1. Peter Rob and Carlos Coronel, **"Database Systems Design, Implementation and Management,"** Cengage Learing, Seventh Edition,2009.

II B.Tech. II Semester

14BT51501: OPERATING SYSTEMS

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Computer Organization".

COURSE DESCRIPTION: Operating systems operations, scheduling; Critical section problem, deadlocks; Paging, segmentation; File Concept, Disk scheduling; I/O interface, concepts of protection.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

CO1. Demonstrate knowledge on Operating system operations, services, file management, disk management, I/O management and protection

CO2. Identify the functionality involved in process management concepts like scheduling and synchronization

CO3. Design models for handling deadlock and perform memory management

CO4. Synthesize and apply programming API's to perform process management

CO5. Use appropriate protection tools to provide access control to Operating system users

CO6. Interpret the mechanisms adopted for File and Directory Maintenance

Detailed Syllabus:

UNIT - I: OPERATING SYSTEMS OVERVIEW AND PROCESS MANAGEMENT (09 periods)

Operating systems operations, Distributed systems, Special purpose systems, Operating systems services, Systems calls, Operating system structure.

Process Management: Process scheduling, Operations on process, Inter process communication, Multi threading models, Threading issues, Scheduling criteria, Scheduling algorithms - First come first served, Shortest-job-first, Priority, Round-robin, Multilevel queue, Multilevel feedback queue.

UNIT - II: SYNCHRONIZATION AND DEADLOCKS (10 periods)

Synchronization: The critical-section problem, Peterson's Solution, Synchronization hardware, Semaphores, Classic problems of synchronization, Monitors.

Deadlocks: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock detection, Deadlock avoidance, Deadlock recovery.

UNIT - III: MEMORY MANAGEMENT (09 periods)

Memory-Management Strategies: Swapping, Contiguous memory allocation, Paging, Structure of the page table, Segmentation.

Virtual Memory Management: Demand paging, Copy-on-Write, Page replacement, Allocation of frames, Thrashing.

UNIT - IV: STORAGE MANAGEMENT (08 periods)

File System: File Concept, Access methods, Directory structure, File system structure, File system implementation, Directory implementation, Allocation methods.

Secondary Storage Structure: Disk structure, Disk attachment, Disk scheduling, Swap-space management, Stable-storage implementation, Tertiary storage structure.

UNIT - V: I/O SYSTEMS AND PROTECTION   (09 periods)

I/O Systems: I/O Hardware, Application I/O interface, Kernel I/O subsystem.

Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights.

Total periods: 45

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, **"Operating System Principles,"** Seventh Edition, Wiley India Edition, 2011.

REFERENCE BOOKS:

1. William Stallings, **"Operating Systems, Internals and Design Principles,"** Seventh Edition, Pearson Education, 2013.

2. Andrew S. Tanenbaum, **"Modern Operating Systems,"** Third Edition, PHI, 2009.

II B.Tech. II Semester
14BT41221: OBJECT ORIENTED PROGRAMMING LAB
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PREREQUISITES: A course on "Object Oriented Programming".

COURSE DESCRIPTION: Hands-on Programming using concepts of classes, objects, inheritance, Polymorphism, String API, Exception Handling mechanisms, Threads, Applets, AWT, Swings and Database Connectivity using JDBC and Servlets.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Design and develop real time applications using applets.
2. Demonstrate problem solving skills using classes, objects, inheritance, runtime polymorphism, AWT and Servlets to develop web/interactive applications.

List of Experiments:

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 first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. 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 to find the average and sum of 1st N numbers using command line arguments

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:

a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes containsonly the method numberOfSides ( ) that shows the number of sides in the given geometrical figures.

b) Write a java program to design a class using the inheritance and static that show all function of bank (withdrawl, deposit) and generate account number dynamically.

c) Write a java program to design(Implement runtime polymorphism) using abstract methods and classes.

4:

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 for sorting a given list of names in ascending order.

c) Write a Java program to make frequency count of words in a given text.

5:

a) Write a java program that import the Userdefine package and access the member variable of classes that contained by the package

b) Wr ite a java progr am to handle Arithme ticException, ArrayIndexOutOfBoundsException using try and multiple catch statements

c) Write a java program to throw a user defined exception called Negative, if the entered input is a negative number and to handle the exception.

6:

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.

7:

a) 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.

b) Write a Java program for handling mouse events.

8:

a) Write a Java program that creates three threads. First thread displays - Good Morning for every one second, the second thread displays - Hello for every two seconds and the third thread displays - Welcome for every three seconds.

b) Write a Java program that correctly implements producer consume r pr oble m using the concept of inter thr ead communication.

9:

a) Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, 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 w er e not an integer, the pr ogram would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

b) 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 ata time No light is on when the program starts.

c) Write a Java program that allows the user to draw lines, rectangles

and ovals.

10:

a) Write an applet that computes the payment of a loan, by taking the amount of the loan, the interest rate and the number of month's values in the text fields. it takes one parameter from the browser: monthly rate as a checkbox ,if it is true, the interest is calculated per month otherwise the interest is calculated per annual.

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.

11: Create a table which should contain at least the following fields: name, password, email-id, phone number. Write a java program to connect to the database (Ex: MS-Access) and extract data from the tables and display them

12: Assume four users user1, user2, user3 and user4 having passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.

a) Create a Cookie and add these four user ids and passwords to this Cookie, read user id and password entered in the login form.

b) If he is valid user (i.e., user-name and password match) welcome him with his name, else display "You are not an authorized user".

TEXT BOOKS:

1. Herbert Schildt, **"The complete reference Java,"** TMH, Seventh Edition, 2007.

2. Timothy Budd, Understanding **"Object–oriented Programming with Java,"** Addison-Wesley, Updated Edition, 2002.

REFERENCE BOOK:

1. Sachin Malhotra, Saurab Choudhary, **"Programming in Java,"** Oxford university press, Second Edition, 2013.

II B.Tech. II Semester

14BT40521: DATABASE MANAGEMENT SYSTEMS LAB

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PRE REQUISITES: A Course on "Database Management Systems"

COURSE DESCRIPTION: Hands on experience on developing ER Design, DDL, DML commands, DCL and TCL Commands, Query processing using Aggregate operators, Subqueries, Joins, Date Manipulation functions, PL/SQL concepts: Triggers, Functions, Cursors, Stored Procedures and basic Programs.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Design and implement a database schema for the sales database.
2. Apply normalization on sales database.
3. Analyze and evaluate the databases using SQL DML/DDL commands.
4. Develop solutions to database problems using programming PL/SQL including stored procedures, stored functions, cursors and triggers.

List of Experiments:

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. 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.

2. 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.

3. Constraints

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

4. 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.

5. 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.

6. Group Functions and SET Functions

i) Write a query to display the total count of customer.

j) Write a query to display the minimum cost of product.

k) Write a query to display average value of product cost rounded to 2nd decimal places.

l) Write a query to display product name with total sale detail in descending order.

m) 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.

7. PL/SQL basic programs

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.

8. SQL Cursor based programs

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

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

9. 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.

10. 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.

11. Triggers

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

b) Create a row level trigger for the PROD table that would fire for INSERT or UPDATE or DELETE operations performed on the PROD table. This trigger will display the profit difference between the old values and new values.

12. Implicit and Explicit Cursors

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.

REFERENCE BOOKS:

1. Satish Ansari, **"Oracle Database 11g: Hands-on SQL and PL/ SQL,"** PHI Publishers, 2010.

2. Pranab Kumar Das Gupta, **"Database Management System Oracle SQL and PL/SQL,"** PHI Learning Private Limited, 2009.

II B.Tech. I Semester
14BT4HS02: **PROFESSIONAL ETHICS**
(Common to CSE, CSSE, IT, CE and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	**70**	**100**	**3 1 - 3**

PREREQUISITES: Nil

COURSE DESCRIPTION: Engineering Ethics, Moral autonomy and Moral dilemmas - Professional and Ideal Virtues, Professional Responsibility and Moral Leadership - Engineering as Social Experimentation, Conscientiousness and Law of Engineering - Responsibilities and Rights, Whistle Blowing - Global Issues, Managerial Ethics.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Apply the principles of ethics to solve engineering problems.
2. Analyze the problems in the implementation of moral autonomy and resolve through consensus.
3. Responsible to follow the codes of ethics.
4. Practice professionalism in Engineering and assess the issues pertaining to moral dilemmas.
5. Function as a member, consultant, Manager, Advisor and Leader in multi-disciplinary teams.
6. Write reports without bias and give instructions to follow ethics.

Detailed Syllabus:

UNIT - I: ENGINEERING ETHICS   **(08 periods)**

Scope and Aim 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   **(10 periods)**

Theories about Virtues, Professions, Professionalism - characteristics, expectations, 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

(09 periods)

Engineering as experimentation- Similarities to standard experiments, learning from the past and knowledge gained. Engineers as Responsible Experimenters-Conscientiousness, moral autonomy and accountability. The challenger case, codes of ethics and limitations. Industrial standards, problems with the law of Engineering.

UNIT - IV: RESPONSIBILITIES AND RIGHTS   **(09 periods)**

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 **(09 periods)**

Multinational corporations-Professional ethics, environmental ethics, computer ethics, Engineers as Consultants, Witnesses, Advisors and Leaders. Engineers as Managers - Managerial ethics applied to Engineering Profession, moral leadership.

Total Periods: 45

TEXT BOOKS:

1. Mike W. Martin, Roland Schinzinger, **"Ethics in Engineering,"** Tata McGraw-Hill, Third Edition, 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, 1st edition, 2001.

3. Charles F. Fledderman, **"Engineering Ethics,"** Pearson Education, 2004.

4. R. Subramanaian, **"Professional Ethics,"** Oxford Higher Education, 2013.

III B.Tech. I Semester
14BT5HS02: MANAGEMENT SCIENCE
(Common to CSE, CSSE, IT and CE)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil

COURSE DESCRIPTION: Concepts of Management, Evolution of thought of Management, Functions of Management, Environmental Scanning, SWOT analysis, Social Responsibility of Management, Operations Management, Forecasting Methods, Work study, Method Study, Work measurement, Statistical Quality Control, Inventory Management, Marketing, Marketing functions, Human Resource Management, Job evaluation, merit rating, Theories of motivation, Project Management, CPM, PERT, Project cost analysis, Project crashing, Entrepreneurship, Entrepreneur vs Manager, Contemporary Management practices, Just-in-time, Enterprise Resource Planning, Business Process Outsourcing, Intellectual property rights and Supply chain management.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Employ fundamental knowledge on 'Management Thought' and 'Management of a business organization'.
2. Apply various Managerial concepts & contexts to attain 'Optimum Utilization of available organizational resources'.
3. Contribute to the group, as an individual, in accomplishing the stated objective of the business organization.
4. Apply gained knowledge on Management to establish and run his/her own organization, if he/she deserve to be an 'Entrepreneur'.
5. Imbibe contemporary practices in applying Management and exercise discernment in implementing managerial decisions for ethical, safe, and sustainable operations of the business.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO MANAGEMENT AND ORGANIZATION
(Periods:09)

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. Basic concepts related to organization- Objectives, Procedure and Principles; Types of organizations - Merits, demerits and adoptability to modern firms.

UNIT - II: OPERATIONS MANAGEMENT **(12 Periods)**

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. Materials management objectives; Inventory - Types of inventory - Classical EOQ model - ABC analysis - Purchase procedure - Stores management. Marketing: Functions of marketing - Marketing mix - Channels of distribution.

UNIT - III: HUMAN RESOURCES MANAGEMENT (HRM)

(06 periods)

Nature and scope of HRM - Functions of HRM - Role of HR Manager in an organization, Job evaluation and merit rating - Maslow's theory of human needs - McGregor's theory X and theory Y - Herzberg's two-factor theory.

U NIT - IV : PROJECT MANAGEMENT (PERT/CPM) AND ENTREPRENEURSHIP   (09 periods)

Network analysis - Program evaluation and review technique (PERT) - Critical path method (CPM) - Probability of completing the project within given time - Project cost analysis - Project crashing.

Introduction to entrepreneurship - Entrepreneurial traits - Entrepreneur vs. manager - Role of entrepreneurship in economic development - Women as an entrepreneur.

UNIT - V: CONTEMPORARY MANAGEMENT PRACTICES

(09 periods)

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.

Total Periods: 45

TEXT BOOKS:

1. O.P. Khanna, **"Industrial Engineering and Management,"** Dhanpat Rai and Sons, 2010.

2. Stoner, **"Freeman and Gilbert, Management,"** Sixth Edition, Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane, **"Marketing Mangement,"** Twelth Edition, PHI, New Delhi, 2007.

2. Koontz and Weihrich, **"Essentials of Management,"** Sixth Edition, TMH, New Delhi, 2007.

3. N.D. Vohra, **"Quantitative Techniques in Management,"** Second Edition, TMH, New Delhi.

4. Heinz Weihrich and Harold Koontz, **"Management- A Global Perspective,"** Tenth Edition, McGraw-Hill International.

III B.Tech. I Semester
14BT51201: COMPUTER NETWORKS

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil

COURSE DESCRIPTION: Introduction to Computer Networks; The Physical Layer; The Data Link Layer; The Medium Access Sub layer; The Network Layer; The Transport Layer; The Application Layer; Network Security.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on:
   - concepts of computer networks.
   - functionality of reference models layers.
   - 3G Mobile Phone Networks, 802.11.
2. Analyze the issues in data link layer by using error detection and correction techniques, medium access sub layer by channel allocation schemes and transport layer by connection management schemes.
3. Acquire problem solving skills to assess the routing of the packet by selecting the appropriate routing algorithms.

Detailed Syllabus:

UNIT - I: INTRODUCTION AND PHYSICAL LAYER   (09 periods)

Uses of Computer Networks, Network Hardware, Network Software, Reference Models: OSI, TCP/IP, Example Networks: Internet, 3G Mobile Phone Networks, 802.11.

Guided Transmission Media, Wireless Transmission.

UNIT - II: DATA LINK LAYER AND MEDIUM ACCESS SUBLAYER
(10 periods)

Data Link Layer Design Issues, Error detection and correction-CRC, Hamming codes, Elementary Data Link Protocols, Sliding Window Protocols.

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

UNIT - III: NETWORK LAYER   (10 periods)

Network Layer Design Issues, Routing Algorithms: Shortest path, Flooding, Distance vector, Hierarchical, Broadcast, Multicast and Any cast, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet.

UNIT - IV: TRANSPORT LAYER   (08 periods)

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

UDP - Introduction, Remote Procedure Call, Real-Time Transport Protocol

TCP - Introduction, Service Model, Protocol, Segment Header, Connection Establishment, Connection Release, Connection Management Modeling, Sliding Window, Timer Management, Congestion Control, The Future of TCP.

UNIT - V: APPLICATION LAYER AND NETWORK SECURITY

(08 periods)

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

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

Total Periods: 45

TEXT BOOK:

1. Andrew S. Tanenbaum and David J. Wetherall, **"Computer Networks,"** Pearson Education, Fifth Edition, 2012.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, "**Data communication and Networking,"** Tata McGraw-Hill, Fifth Edition, 2006.

2. James F. Kurose and Keith W. Ross, **"Computer Networking A Top-Down Approach Featuring the Internet,"** Pearson Education, Second Edition, 2003.

III B.Tech. I Semester
14BT51202: SOFTWARE ENGINEERING
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil

COURSE DESCRIPTION: Concepts of Software Engineering, software process models: Conventional and agile process models, software requirements engineering process, system analysis, architectural design, User interface design and re-engineering, software testing, risk and quality management.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge in:
   - Fundamental concepts of software engineering.
   - Process models.
   - Software development life cycle.
2. Analyze software requirements and process models required to develop a software system.
3. Design and develop a quality software product using design engineering principles.
4. Demonstrate skills in applying risk and quality management principles for effective management of software projects.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO SOFTWARE ENGINEERING

(09 periods)

A Generic view of process: Evolving role of software, Software myths, Software engineering- A layered technology, A process framework, CMMI, Process patterns, Process assessment, Personal and team process models.

Process models: Waterfall model, Incremental process models, Evolutionary process models, the unified process, agile process models- Scrum, agile modeling.

UNIT - II: REQUIREMENTS ENGINEERING   (09 periods)

Functional and non-functional requirements, the software requirements document, Requirements specifications, Requirements engineering processes, Requirements elicitation and analysis, Requirements validation, Requirements management.

System modeling: Context models, Interaction models, Structural models, Behavioral models, Model driven engineering.

UNIT - III: DESIGN ENGINEERING   (09 periods)

Creating an architectural design: Design process and design quality, Design concepts, Software architecture, Data design, Architectural styles and patterns, Architectural design

Performing user interface design: The golden rules, User interface

analysis and design, Interface analysis, Interface design steps, Re-engineering.

UNIT - IV: SOFTWARE TESTING   (10 periods)

Testing strategies: A strategic approach to software testing, Strategic issues, Test strategies for conventional software, Test strategies for object oriented software , Validation testing, System testing, The art of debugging.

Testing tactics: Software testing fundamentals, white box testing, Basis path testing, Control structure testing, Black box testing, Object oriented testing methods.

UNIT - V: RISK AND QUALITY MANAGEMENT   (08 periods)

Risk management: Reactive and proactive risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM plan.

Quality management: Quality concepts, Software quality assurance, Software reviews, Formal technical reviews, Formal approaches to SQA, Statistical software quality assurance, Software reliability.

Total Periods: 45

TEXT BOOKS:

1. Roger S. Pressman, **"Software Engineering, A practitioner's Approach,"** McGraw-Hill International Edition, Sixth Edition, 2010.

2. Ian Sommerville, **"Software Engineering,"** Pearson Education, Nineth Edition, 2011.

REFERENCE BOOKS:

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", New Age International Publishers, Third Edition, 2007.

2. Shely Cashman Rosenblatt, **"Systems Analysis and Design,"** Thomson Publications, Sixth Edition, 2006.

III B.Tech. I Semester

14BT50431: MICROPROCESSORS AND INTERFACING
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Digital Logic Design and Computer Organization".

COURSE DESCRIPTION: INTEL 8086 & 8031/51- Architectures; Instruction set; Programmable Interfacing Concepts; Serial Communication; Advanced peripheral Interfacing; Applications.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate potential knowledge in:
   - Internal hardware details of Intel 8086,8051
   - Interfacing various peripherals to build stand alone systems
2. Critically analyze various peripherals and interfacing techniques
3. Design and develop Microcomputer based system to suit a particular application.
4. Choose suitable Hardware and Software components of a system that work together to solve engineering problems.

Detailed Syllabus:

UNIT - I - INTEL 8086 ARCHITECTURE AND PROGRAMMING
(11 periods)

Evolution of Microprocessors, 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, Addressing modes, Assembler directives, Instruction set of 8086, Simple programs , Procedures and Macros.

UNIT - II - MEMORY INTERFACING, PRIORITY INTERRUPT CONTROLLER AND DMA   (07 periods)

Memory (static RAM and EPROM) and I/O interfacing, 8257 (DMA controller), Interrupt structure, Interrupt vector table, 8259 Programmable Interrupt Controller (PIC), importance of cascading of PICs.

UNIT - III - 8255A AND ITS APPLICATIONS   (07 periods)

Types of data communication - serial and parallel, Methods of parallel data transfer, 8255A (programmable peripheral interface) - Internal block diagram, Control words and initialization, interface of I/O devices: key board, stepper motor.

UNIT - IV - SERIAL DATA COMMUNICATION AND STANDRADS
(08 periods)

Types of serial data transmission - synchronous and asynchronous, 8251 (USART) - architecture, Simple programs for sending and receiving characters with an 8251 (polling & interrupt basis), serial communication

standards- RS232C. RS232C to TTL and TTL to RS232C conversion.

UNIT - V - 8031/51 MICROCONTROLLER ARCHITECTURE AND PROGRAMMING (12 periods)

Microcontrollers Vs. general purpose processors, Criterion for choosing microcontroller, 8051 Architecture- Internal and external memories, Timers/Counters, Serial communication, Interrupts. Addressing modes, Instruction set of 8051, simple programs using 8051, Timer Programming, Serial port programming, Interrupts programming.

Total Periods: 45

TEXT BOOKS:
1. Douglas V. Hall, **"Mic roproc es sors and Interfacing : Programming and Hardware,"** revised Second Edition, TMH, 2006.

2. Mazidi and Mazidi, **"The 8051 Microcontroller and Embedded Systems,"** PHI, 2000.

REFERENCE BOOKS:
1. A.K. Ray & K.M.Bhurchandi, **"Advanced Microprocessors and Peripherals- Architecture, Programming and Interfacing,"** TMH, 2002.

2. Yu-cheng Liu, Glenn A. Gibson, **"Microcomputer systems: The 8086/8088 Family architecture, Programming and Design,"** PHI, 2006.

3. Kenneth J. Ayala, **"The 8051 Microcontroller-Architecture, Programming & Applications,"** Cengage learning, Third Edition, 2004.

III B.Tech. I Semester

14BT50501: THEORY OF COMPUTATION

(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Discrete Mathematical Structures".

COURSE DESCRIPTION: Fundamentals of computation - Finite State Automaton; Push Down automaton; Turing Machine; and decidability of problems.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate Knowledge on:
   - Finite State Automaton
   - Regular Expression
   - Push Down Automaton and Turing Machine.
2. Develop formal proofs for models of Computation.
3. Apply the concepts of automata in modeling abstract devices.

Detailed Syllabus:

UNIT - I: FINITE AUTOMATA (09 periods)

Finite Automata: Intr oduction to Finite Autom ata, Structural Representations, Automata and Complexity, The Central Concepts of Automata Theory, An Informal Picture of Finite Automata, Deterministic Finite Automata, Nondeterministic Finite Automata, Finite Automata with epsilon-Transitions.

UNIT - II: REGULAR EXPRESSIONS (09 periods)

Regular Expressions: Regular Expressions, Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expression, Proving Languages not to be Regular, Closure Properties of Regular Languages, Equivalence and Minimization of Automata.

UNIT - III: CONTEXT-FREE GRAMMARS AND PUSH DOWN AUTOMATA

(10 periods)

Context-Free Grammars: Context-Free Grammars, Parse Trees, Applications of Context-Free Grammars, Ambiguity in Grammars and Languages, Normal Forms for Context-Free Grammars, The Pumping Lemma for Context-Free Languages.

Push Down Automata: Definition of the Pushdown Automaton, The Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata.

UNIT - IV: TURING MACHINES AND LINEAR BOUNDED AUTOMATA

(08 periods)

Turing Machines: Types of Computational Problems, The Turing Machine, Programming Techniques for Turing Machine, Extensions to the Basic Turing Machine, Restricted Turing Machines, Turing Machines and Computers, The Model of Linear Bounded Automaton.

UNIT - V: UNDECIDABILITY (09 periods)

Undecidability: Language that is not Recursively Enumerable, An Undecidable Problem, Undecidable Problems about Turing Machines, Post's Correspondence Problem.

Total Periods: 45

TEXT BOOK:
1. John E. Hopcroft, Raje ev Motwani, Je ffre y D Ullm an, **"Introduction to Automata Theory, Languages and Computation,"** Third Edition, Pearson, 2011.

REFERENCE BOOKS:
1. K.L.P. Mishra and N.Chandrasekaran, **"Theory of Computer Science: Automata Languages and Computation,"** Third Edition, PHI Learning, 2009.

2. John C Martin, **"Introduction to Languages and the Theory of Computation,"** Third Edition, TMH, 2009.

III B.Tech. I Semester
14BT50502: UNIX INTERNALS
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Operating Systems".

COURSE DESCRIPTION: Concepts of Unix Operating Systems; Utilities; Shell Programming; Process; Signals; File Locking to provide Security; Inter process Communications and Socket Programming for client server Interaction.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on:
    - Internal Structure of UNIX Operating System,
    - Utilities and shell programming
    - Processes management and handling signals,
    - File Locking
    - Sockets and IPC
2. Analyze and identify the system calls to interact with Unix Environment.
3. Implement UNIX applications using Shell Scripting for simple problems and C programming for IPC and Sockets.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO UNIX AND UTILITIES

(09 periods)

General Review of the System: History of UNIX, Architecture of UNIX, User Perspective.

The Buffer Cache: Headers, Buffer Pool, Scenarios for Retrieval of a Buffer, Reading and Writing Disk Blocks, Advantages and Disadvantages.

Utilities: General Purpose Utilities, File Handling Utilities, Security by File Permissions, Process Utilities, Disk Utilities, Networking Commands.

UNIT - II: SHELL PROGRAMMING **(08 periods)**

Text Processing Utilities and Backup Utilities, Shell, Shell Responsibilities, Types of Shell, Pipes and I/O Redirection, Shell as a Programming Language, Shell Syntax: Variables, Conditions, Control Structures, Functions, Commands, Command Execution, Shell Scripts.

UNIT - III: FILE SYSTEM STRUCTURE AND SYSTEM CALLS

(10 periods)

Introduction to Unix File System, File Descriptors, Inode Representation, Super Block, System Calls and 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.

Scanning directories: opendir,readdir,telldir,seekdir,rewinddir,closedir.

UNIT - IV: PROCESS, SIGNALS AND FILE LOCKING   (09 periods)

Process, Process Identifiers, Process Structure, Zombie Processes, Orphan Process, fork, vfork, exit, wait, waitpid, exec, Signals functions, Unreliable Signals, Interrupted System Calls, kill, raise, alarm, pause, abort, system, sleep Functions, Job Control Signals.

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 - V: INTER-PROCESS COMMUNICATION AND SOCKETS

(09 periods)

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

Total periods: 45

TEXT BOOKS:
1. Ne il Matthew , **" Richard Stones , Beginning Linux Programming,"** Wiley Dreamtech, 2004.
2.　　　　　Maurice J. Bach, **"The Design of the Unix Operating System,"** Pearson Education, 2002.

REFERENCE BOOKS:
1. Sumitabha Das, **"Your Unix The Ultimate Guide,"** TMH, 2007.
2. W. Richard. Stevens, **"Advanced Programming in the UNIX Environment,"** Second Edition, Pearson Education, 2005.

III B.Tech. I Semester
14BT51221: UNIX & COMPUTER NETWORKS LAB

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PREREQUISITES: A course on "Unix Internals", "Computer Networks", "Object Oriented Programming" and "Problem Solving and Computer Programming".

COURSE DESCRIPTION: Hands-on Experience on Unix Commands; Shell Scripting; IPC; Sockets; data link Framing methods; CRC; Routing algorithms; Congestion Control Algorithms; Substitution Techniques.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate analysis skills on:

    a. Framing mechanisms for data link layer

    b. CRC

    c. Unix utilities and shell scripting

2. Simulate routing algorithms:

    a. Shortest path using Dijkstra's

    b. Distance vector

3. Apply IPC te chniques in Unix Environment to e stablish communication among the processes.

List of Experiments:

PART-A: UNIX INTERNALS

1. Create two files source.txt and dest.txt using vi editor which contains some text and practice the following commands on that files cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, cp, mv, ln, rm, unlink.

2. a) Write a shell script that takes a command line argument and reports on whether it is directory, a file, or something else.

    b) Write a shell script that accepts one or more file names as arguments and converts all of them to uppercase, provided they exist in the current directory.

3. a) Simulate Uniq command using C.

    b) Simulate grep command using C.

4. 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.

5. Implement the Following IPC Forms:

    a) FIFO.

    b) PIPE.

6. Write a program to:

    a) Create the semaphore.

b) Set values to semaphores.

c) Get the values from the semaphore.

d) Remove semaphore.

7. a) Implement file transfer using Message Queue form of IPC.

b) Write a program to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use semaphores to avoid race conditions.

8. Perform Socket Programming using:

a) UDP socket.

b) TCP socket.

PART-B: COMPUTER NETWORKS

1. Implement the following data link layer framing methods:

a. Character Count.

b. Character stuffing.

c. Bit stuffing.

2. Design a program to compute checksum for the given frame 1101011011 with the generator Polynomial of CRC 12, CRC 16 and CRC CCIP. Display the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receivers end.

3. Implement Dijkstra 's algorithm to compute the Shortest path through the following graph.
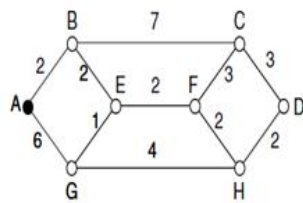
4. Design a program to obtain routing table for each node using distance vector routing algorithm by considering the given subnet with weights indicating delay between nodes.
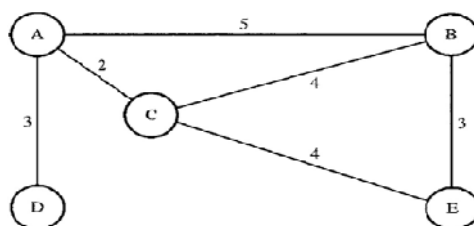
5. Simulate Random Early Detection congestion control algorithm.

6. Encrypt the message "COMPUTER NETWORKS LAB" using Caesar cipher with a key of 20. Ignore the space between words. Decrypt the message to get the original plain text.

REFERENCE BOOKS:

1. B.A. Forouzan and R.F. Giberg, Thomson, **"Unix and shell**

Programming -A text book," Pearson Education, 2009.

2. Andrew S. Tanenbaum and David J. Wetherall, **"Computer Networks,"** Pearson Education, Fifth Edition, 2012.

3. Richard Stevens, **"Advance UNIX Programming in the UNIX Environment,"** Pearson Education, Second Edition, 2005.

4. Behrouz A. Forouzan, **"Data communication and Networking,"** Tata McGraw-Hill, Fourth Edition, 2006.

III B.Tech. I Semester

14BT50424: MICROPROCESSORS AND INTERFACING LAB

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PREREQUISITES: Courses on "Digital logic design", and "Micro processors and Micro controllers".

COURSE DESCRIPTION: Assembly language Programming for Intel 8086 & 8051; Interfacing standard peripherals & Programming-DAC; Stepper Motor; ADC; Logic Controller; Keyboard; Seven Segment Display.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Analyze various programming alternatives & interfacing methods to build a typical microcomputer based system.
2. Design and develop microcomputer based system to solve various problems.

List of Experiments:

I Programs using 8086

1. Introduction to MASM/TASM
2. Arithmetic operations
3. Logic operations
4. String operations
5. Modular program: use procedure

II Interfacing with 8086

1. Stepper motor
2. Logic controllers
3. A/D and D/A converter
4. Seven segment display
5. Keyboard interfacing

III 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
14BT5HS01: MANAGERIAL ECONOMICS AND PRINCIPLES OF ACCOUNTANCY

(Common to CSE, CSSE, IT, CE and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Managerial Economics; Demand and Elasticity of Demand; Supply and supply function; Production Functions; Markets and Pricing Policies; Formation of different types of Business Organizations; Basic concepts of Journal, Ledger and Trial balance; Trading Account, Profit and Loss Account and Balance sheet with simple adjustments; Computerized Accounting.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in:
   a) Tools and concepts of Micro Economics.
   b) Basic Principles and concepts of Accountancy.
   c) Provides life skills for effective utilization of scarce resources.
   d) Financial Accounting.
   e) Using advanced tools like tally and SAP.
   f) Significance of Economics and Accountancy
2. Develop skills in providing solutions for
   a) Managerial decisions of an organization.
   b) Demand & Supply, Production & Cost and Markets & Price through Economic theories.
3. Develop effective communication in Business and Accounting transactions.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO MANAGERIAL ECONOMICS, DEMAND & SUPPLY ANALYSIS: (09 periods)

Definition, Nature and Scope of Managerial Economics.

Demand: Determinants of demand - Demand function - Law of demand, assumptions and exceptions - Elasticity of demand -Types of elasticity of demand -Demand forecasting and methods of demand forecasting, Supply- Determinants of Supply and Supply function.

UNIT - II : THEORY OF PRODUCTION AND COST ANALYSIS:

(09 periods)

Production Function: Isoquants and Isocosts, Input-output relationship - Law of returns. Cost Concepts, Total, Average and Marginal Cost, Fixed vs. Variable costs, Opportunity Costs Vs Outlay Costs, Separable Costs Vs Joint Costs, Urgent Costs Vs Postponable Costs, Avoidable Costs Vs

Unavoidable Costs, Break Even Analysis (BEA)-Assumptions, Merits and demerits, Determination of Break Even Point (Simple problems).

UNIT - III : INTRODUCTION TO MARKETS AND PRICING: (09 periods)

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, Market penetration, Market skimming, Block pricing, Peak load pricing, Cross subsidization.
Capital: Significance, Types of capital, Sources of Capital.

UNIT - IV : INTRODUCTION AND PRINCIPLES OF ACCOUNTING (Periods:09)

Accountancy: Introduction, Concepts, Conventions, Accounting Principles, Double Entry Book Keeping, Journal, Ledger, Trial Balance (Simple problems).

UNIT - V : FINAL ACCOUNTS: (09 periods)

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

Computerization of Accounting System: Manual Accounting Vs Computerized Accounting, Advantages and Disadvantages of Computerized Accounting.

Total periods: 45

TEXT BOOKS:
1. A.R . Ary asri, **"Manag erial Economics and Financial Analysis,"** Tata Mc- Graw Hill, New Delhi, Third Edition, 2007.

2. R.Cauvery, U.K. Sudhanayak, M. Girija and R. Meenakshi, **"Managerial Economics,"** S. Chand and Company, New Delhi, Second Edition, 2010.

REFERENCE BOOKS:
1. Vershaney and Maheswari, **"Managerial Economics,"** Sultan Chand and Sons,New Delhi, Nineteenth Edition, 2005.

2. H. Craig Petersen and W. Cris Levis, **"Managerial Economics,"** Pearson Education, Fourth Edition, 2009.

3. Lipsy and Chrystel, **"Economics,"** Oxford University Press, New Delhi, TwelfthEdition, 2011.

4. S.P. Jain and K.L. Narang, **"Financial Accounting,"** Kalyani Publishers, Ludhiana, Sixth Edition, 2002.

III B.Tech. II Semester

14BT61201: DATAWAREHOUSING AND DATA MINING

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Database Management Systems"

COURSE DESCRIPTION: Data Warehouse Design; Data Mining Fundamentals; Data Preprocessing; Mining Frequent Patterns; Classification and Prediction; Clustering Techniques.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
   - Concepts of data mining and data warehousing
   - Data preprocessing and association rule mining
   - Classification and Prediction techniques
   - Clustering techniques
2. Analyze data mining techniques for finding necessary useful and potential knowledge.
3. Apply machine learning techniques to discover and measure interesting patterns from large databases.

Detailed Syllabus:

UNIT - I: DATA WAREHOUSING AND DATA MINING (12 periods)

Data Warehouse: Basic Concepts, Modeling, Design and Usage, Data Generalization by Attribute-oriented Induction Data Mining: Why Data Mining, What is Data Mining, Kinds of data can be mined, Kinds of patterns can be mined, Kinds of applications targeted, Major Issues in Data Mining.

UNIT - II: DATA PREPROCESSING (10 periods)

Data Preprocessing: An Overview, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization.

UNIT - III: MINING FREQUENT PATTERNS, ASSOCIATIONS AND CORRELATIONS (07 periods)

Basic Concepts, Frequent Itemset Mining Methods, pattern mining in Multilevel and Multidimensional Space.

UNIT - IV: CLASSIFICATION AND PREDICTION TECHNIQUES

(09 periods)

Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule Based Classification, Techniques to improve classification accuracy: Bagging and Boosting, Bayesian Belief Networks, Classification using frequent patterns.

UNIT - V: CLUSTER ANALYSIS (07 periods)

Cluster Analysis, Partitioning Methods: K-Means; Hierarchical Methods: AGNES Vs DIANA; Density based Methods: DBSCAN, Outlier Analysis and Detection Methods.

Total Periods: 45

TEXT BOOK:

1. Jiawei Han, Micheline Kamber and Jian Pei, **"Data Mining: Concepts and Techniques,"** Third Edition, Elsevier, 2013.

REFERENCE BOOKS:

1. Margaret H Dunham, **"Data Mining Introductory and Advanced Topics,"** Second Edition, Pearson Education, 2006.

2. Tan P.N, Steinbach M. and Kumar V.: **"Introduction to Data Mining",** Addison-Wesley, 2006.

III B.Tech. II Semester
14BT61202: WEB PROGRAMMING
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Pr oblem Solving and Computer Programming".

COURSE DESCRIPTION: Hyper Text Markup Language (HTML); Features of HTML5; Cascading Style Sheets (CSS); JavaScript; JQuery; Hypertext Preprocessor (PHP); MySQL; Extensible Markup Language (XML); Asynchronous Java Script and XML (AJAX).

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on web technologies : HTML, HTML5, CSS, JavaScript, JQuery, XML, AJAX, PHP and MySQL database.
2. Design and develop web applications using HTML, CSS, JavaScript, JQuery, XML, AJAX and PHP.
3. Apply PHP and MySQL database concepts for developing interactive, dynamic and scalable web applications.
4. Gain problem solving skills to develop enterprise web applications.

Detailed Syllabus:

UNIT - I: HTML   (11 periods)

Introduction: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Creating Tables, Working with Images, Canvas, Forms, Frames and Multimedia.

HTML5: Introduction, HTML5 Document Structure, Creating Editable Content, Checking Spelling Mistakes, Exploring Custom Data Attributes, Client-Side Storage, Drag and Drop Feature, Offline Web Applications, Web Communications, Cross-Document Messaging and Desktop Notifications.

UNIT - II: CSS AND JAVASCRIPT: (10 periods)

CSS: Introduction, CSS Selectors, Inserting CSS in an HTML document, Backgrounds, Fonts, and Text Styles, Creating Boxes, Displaying, Positioning and Floating Elements, Features of CSS3.

JAVASCRIPT: Overview of JavaScript, JavaScript Functions, Events, Image Maps and Animations, JavaScript Objects, Working with Browser and Document Objects, JQuery - Introduction, JQuery Selectors, Events, Methods to access HTML elements and attributes.

UNIT - III: INTRODUCTION TO PHP   (07 periods)

Introduction, Data Types, Variables, Constants, Expressions, String Interpolation, Control Structures, Functions, Arrays, Embedding PHP Code in Web Pages, Object Oriented PHP.

UNIT - IV: PHP AND MYSQL   (07 periods)

PHP and Web Forms, Sending Form Data to a Server, Working with Cookies and Session Handlers, PHP with MySQL - Interacting with the Database, Prepared Statement, Database Transactions.

UNIT - V: XML AND AJAX   (10 periods)

XML: Introduction, Structure of XML Document, Document Type Definition, XML Namespaces, XML Schema, Working with DOM and SAX Parser, Working with XSLT.

AJAX: Overview, Exploring AJAX, XMLHttpRequest object.

Total Periods: 45

TEXT BOOKS:

1. Kogent Learning Solutions Inc, **"HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery,"** Dreamtech Press, First Edition, 2011.

2. W. Jason Gilmore, **"Beginning PHP and MySQL,"** APress, Fourth Edition, 2011.

REFERENCE BOOKS:

1. Thomas A. Powell, **"The Complete Reference: HTML and CSS,"** Tata McGraw Hill, Fifth Edition, 2010.

2. Andrea Tarr, **"PHP and MySQL,"** Willy India, First Edition, 2012.

III B.Tech. II Semester

14BT40503: **DESIGN AND ANALYSIS OF ALGORITHMS**

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISI TES: A course on " Pr oblem Solving & Computer Programming".

COURSE DESCRIPTION: Introduction to algorithms and notations; Disjoint sets and graphs; Divide and conquer; Greedy method; Dynamic programming; Backtracking; Branch and bound; and NP-hard and NP-complete problems.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
- Algorithm Complexities and Asymptotic notations.
- Algorithm Design techniques-Divide and Conquer, Greedy Method, dynamic programming, Back tracking, Branch and Bound.
- NP-Hard and NP-Complete problems.
2. Analyze the performance of algorithms with time and Space complexities.
3. Design the algorithms for solving real world problems.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO ALGORITHMS & DISJOINT SETS

(09 periods)

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.

Disjoint Sets - Disjoint set operations, union and find algorithms.

UNIT - II: GRAPHS & DIVIDE AND CONQUER (10 periods)

Graphs-Breadth First search and Traversal, Depth First Search and Traversal, spanning trees, connected components and biconnected components.

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

UNIT - III : GREEDY METHOD & DYNAMIC PROGRAMMING

(09 periods)

Greedy Method - General method, Applications-Job sequencing with deadlines, knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

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.

UNIT - IV: BACKTRACKING & BRANCH AND BOUND (09 periods)

General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

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

UNIT - V: NP-HARD AND NP-COMPLETE PROBLEMS (08 periods)

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

Total Periods: 45

TEXT BOOK:

1. Ellis Horowitz, Satraj Sahni and Rajasekharam, **"Fundamentals of Computer Algorithms,"** Galgotia publications Pvt. Ltd, New Delhi, Second Edition ,2007.

REFERENCE BOOKS:

1. M. T. Goodrich and R . Tomassia, **" Algorithm Design: Foundations, Analysis and Internet examples,"** John Wiley and sons, 2002.

2. S.Sridhar, **"Design and Analysis of Algorithms,"** Oxford Press, First Edition, 2015.

III B.Tech. II Semester

14BT60501: OBJECT ORIENTED ANALYSIS & DESIGN

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Software Engineering" and "Object Oriented Programming".

COURSE DESCRIPTION: Introduction to UML; basic structural modeling; advanced structural modeling; class and object diagrams; basic behavioral modeling; advanced behavioral modeling; architectural modeling.

COURSE OUTCOMES:

After the successful completion of the course the student will be able to:

1. Demonstrate knowledge on principles of Object Oriented analysis, design through UML Diagrams.
2. Analyze the concepts of high level & low level software design.
3. Draw UML models for real time software applications.

Detailed Syllabus:

UNIT-I: INTRODUCTION TO UML, BASIC STRUCTURAL MODELING
                                                    (11 periods)

Introduction to UML: Importance of modeling, Principles of modeling, Object Oriented Modeling, An overview of UML, conceptual model of the UML, Architecture, Software Development Life Cycle.

Basic Structural Modeling:

Classes-Terms and concepts, Common modeling techniques, Relationships-modeling simple dependencies, single inheritance and structural relationships, common Mechanisms, and Diagrams.

UNIT - II: ADVANCED STRUCTURAL MODELING,CLASS AND OBJECT DIAGRAMS   (07 periods)

Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, Instances.

Class and Object Diagrams:

Terms and concepts, modeling techniques for Class Diagram-modeling Simple collaboration, Logical database Schema, Forward and reverse engineering, Introduction to Object Diagrams.

UNIT - III: BASIC BEHAVIORAL MODELING   (09 periods)

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.

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, requirement of a system, Forward and reverse engineering, Activity Diagrams-terms and concepts, modeling a workflow, modeling an operation, Forward and reverse engineering.

UNIT - IV: ADVANCED BEHAVIORAL MODELING (09 periods)

Events and signals-modeling a family of signals and exceptions, state machines-modeling the lifetime of an object, Introduction to Processes and Threads, time and space-modeling timing constraints, distribution of objects and objects that migrate, state chart diagrams-modeling reactive objects, Forward and reverse engineering.

UNIT - V: ARCHITECTURAL MODELING   (09 periods)

Component-Terms and concepts, modeling executables and libraries, modeling tables, file and documents, modeling an API, 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, Deployment diagrams-modeling an embedded systems, Client/server System, fully distributed systems, Forward and reverse engineering.

Total Periods: 45

TEXT BOOK:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, **"The Unified Modeling Language User Guide,"** Second Edition, 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.   Pascal Roques, **"Modeling Software Systems Using UML2,"** WILEY-Dreamtech India Pvt. Ltd, 2004.

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III B.Tech. II Semester
14BT6HS01: BANKING AND INSURANCE
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	3

PREREQUISITES: Managerial Economics and Principles of Accountancy

COURSE DESCRIPTION: Origin and growth of Banking; functions and importance; RBI; Debtor and Creditor relationship; Types of Accounts; Loans and Advances; e-payment; e-cash; NEFT; RTGS; Credit and Debit cards; Insurance elements and risk; LIC; GIC; IRDA.

COURSE OUTCOMES:
After the successful completion of the course, the student will be able to:
1. Acquire Knowledge in:
   a) Tools and concepts of Banking and Insurance.
   b) Basic Principles and concepts of Insurance and Banking.
   c) Provides life skills for effective utilization of Banking and Insurance facilities.
   d) e-fund transfers, e-payments and e-business models.
2. Develop analytical skills in understanding problems pertaining to
   a) Online banking and e - payments.
   b) Risk Management through insurance benefits the society at large.
   c) money management by leveraging on technology, banking and insurance services.

Detailed Syllabus:

UNIT – I: INTRODUCTION TO BANKING   (09 periods)

Origin and growth of banking, meaning and functions of banking, importance of banking, Reserve Bank of India; functions, monetary policy, open market operations.

UNIT – II: BANK-CUSTOMER RELATIONSHIP   (09 periods)

Debtor-creditor relationship, anti money laundering, products or services, payment and collection of cheques and other negotiable instruments. Accounts – Types of accounts, procedure for opening and closing an account. Loans and Advances- principles of lending, types of loans,

UNIT – III: BUSINESS MODELS AND ELECTRONIC PAYMENT SYSTEM   (09 periods)

Features, types of e-payment system, e-cash ,NEFT,RTGS, Electronic purses, Credit and Debit cards, Business models- B2B, B2C, C2C, and B2G.

UNIT – IV : INTRODUCTION TO INSURANCE   (09 periods)
Introduction - Insurance definition, elements of insurance concept of risk, risk Vs uncertainty.

UNIT – V: INSURANCE OVERVIEW: (09 periods)
Principles of insurance, insurance types, LIC & GIC insurance contract-nature, elements, functions, IRDA, Insurance Players in India.
                                                      Total Periods: 45

TEXT BOOKS:

1. A.V. Ranganadha Chary, R.R. Paul- **Banking and Financial system**, Kalyani Publisher, New Delhi, Second Edition.

2. P.K.Gupta- **Insurance and Risk Management**, Himalaya Publishing House, New Delhi.

REFERENCE BOOKS:

1. Diwan, Praq and Sunil Sharma: **"Electronic Commerce- A Manager's Guide to E-Business,"** Vanity Books International, Delhi, 2002.

2. Kalakota Ravi and Whinston Andrew B: **'Frontiers of Electronic Commerce,"** Pearson Education India, 1996 New Delhi.

3. Schneider, Grey P: **"Electronic Commerce, Course Technology', Cengage Learning,"** 2008, Fighth Edition, New Delhi.

III B.Tech. II Semester

14BT6HS02: COST ACCOUNTING AND FINANCIAL MANAGEMENT

(OPEN ELETIVE)

(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Scope, Objectives and Elements of cost Accounting; Cost Sheet and Tender quotations; Variance Analysis: Material variances, Labor variances; Meaning and Scope, Liquidity, Profitability Ratios: concept of Risk and Returns on Investment.

COURSE OUTCOMES:

After the successful completion of the course the student will be able to:

1. Acquire Knowledge in
    a) Elements of Costing.
    b) Basic concepts of Financial Management.
    c) Risk and Return
    d) Financial Accounting.
    e) Using advanced tools like tally and SAP.
    f) Significance of Economics and Accountancy
2. Do cost, risk and return of investment analysis.
3. Develop skills in providing solutions for
    a) Material, Labor, Overheads control.
    b) Excellence and ability to minimize the cost of the organization.
    c) Effective investment decisions.
4. Prepare cost sheets pertaining to manufacturing of products.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO COST ACCOUNTING   (09 periods)

Cost and Cost Accounting, Scope, Obje ctive s, Advantages and disadvantages –Cost Accounting Vs Management Accounting – Elements of Costing –Installation of costing system – Material Control, Labor Control, Overhead Control, Fixed and Variable, Direct and Indirect Costs.

UNIT - II: COST ANALYSIS   (09 periods)

Analysis of Cost – Preparation of cost sheet, estimate, tender and quotation (Simple problems) –Importance of Costing while pricing the products.

UNIT - III: STANDARD COSTING   (09 periods)

Introduction to Standard Costing & Variances – Variance Analysis: Material variances, Labor variances (Simple Problems).

UNIT - IV: FINANCIAL MANAGEMENT   (09 periods)

Financial Management-Meaning and Scope, Liquidity, Profitability, Financial Statement Analysis through ratios (Simple Problems).

UNIT - V: RISK AND RETURNS ON INVESTMENT   (09 periods)

Investment-Meaning and Definition- concept of risk and returns- Investment Alternatives- Introduction to Behavioral Finance – Anomalies –Key Concepts –Anchoring – Mental Anchoring-Confirmation and

Hindsight Bias-Gambler's Fallacy-Herd Behavior-Over Confidence-Overreaction and Availability Bias-Prospect Theory.

Total Periods: 45

TEXT BOOKS:

1. S.P. Jain and K.L. Narang: **"Cost Accounting**," Kalyani Publishers, Ludhiana, Sixth Edition, 2002.

2.   James C Van Horne, **"Financial Management and Policy,"** Prentice-Hall of India/Pearson, Twelfth Edition, 2001.

REFERENCE BOOKS:

1. The Institute of Company Secretaries of India, **"Cost and Management Study Material**," New Delhi.

2. I.M. Pandey, **"Financial Management,"** Vikas Publishing House Pvt. Ltd., Tenth Edition, 2010.

III B.Tech. II Semester

14BT6HS03: ENTREPRENEURSHIP FOR MICRO, SMALL AND MEDIUM ENTERPRISES

(OPEN ELECTIVE)

(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Introduction to Entrepreneur Development; Idea generation and formation of Business Plan; Micro and Small Enterprises; Institutional Finance and Support to Entrepreneur; Woman Entrepreneurship.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Acquire Knowledge in:
    a) Schemes and institutions encouraging entrepreneurship.
    b) Basic Principles and concepts of Accountancy.
    c) Significance of entrepreneurship.
2. (i) Develop analytical skills in understanding problems pertaining to
    a) Personal excellence through financial and professional freedom.
    b) Women entrepreneurship acts as contrivance in the societal development
    (ii) Develop Critical thinking and evaluation ability.
3. Generate ideas for formulating business plans.

Detailed Syllabus:

UNIT – I: INTRODUCTION TO ENTREPRENEURSHIP DEVELOPMENT
(09 periods)

Concept of Entrepreneurship – Growth of Entrepreneurship in India **-** Factors affecting entrepreneurship growth - Characteristics of an Entrepreneur – Functions of Entrepreneur – Need for an Entrepreneur – Entrepreneurial Decision Process – Types of Entrepreneurs – Distinction between an Entrepreneur and a manager – Intrapreneur - Entrepreneur Vs Intrapreneur.

UNIT – II: IDEA GENERATION AND FORMULATION OF BUSINESS PLANS :   (09 periods)

Sources of Ideas – Methods of idea generation - Product Identification – Opportunity Selection – Steps in Setting up of a Small Business Enterprise - Contents Of Business Plans – Significance – Formulation of Business Plan – Business Opportunities in Various Sectors – Common Errors in Business Plan Formulation – Project Report Preparation.

UNIT – III: MICRO AND SMALL ENTERPRISES   (**09 periods)**

Meaning and Definition – Micro and Macro units – Essentials – Features – Characteristics – relationship between Micro and Macro Enterprises – Rationale behind Micro and Small Enterprises – Scope of Micro and Small Enterprises – Objectives of Micro Enterprises - Problems of Micro and Small Enterprises

UNIT – IV: INSTITU TIONAL F INANCE AND SUPPORT TO ENTREPRENEUR **(09 periods)**

Need for Institutional Finance **-** Commercial Banks - Industrial Development Bank of India (IDBI) – Industrial Finance Corporation of India Ltd. (IFCI) – Industrial Credit Investment Corporation of India Ltd. (ICICI)– State Financial Corporations (SFCs) - State Industrial Development Corporations (SIDCs) – Small Industries Development of Bank of India (SIDBI) –– Need For Institutional Support – National Small Industries Corporation Ltd (NSIC) – Small Industries Development Organisation (SIDO) – Small Industries Service Institutes (SISIs) – District Industries Centres (DICs) – National Institute of Entrepreneurship and Small Business Development (NIESBUD) – Technical Consultancy Organizations (TCOS)(Origin, Mission, and credit facility/support).

UNIT –V: WOMEN ENTREPRENEURSHIP **(09 periods)**

Concept of Women entrepreneur - Functions of Women entrepreneurs - Growth of women entrepreneurship in India - Challenges of Women entrepreneurs- Programmes supporting women entrepreneurship – Rural Entrepreneurship – Meaning, Need for Rural entrepreneurship, Problems of rural entrepreneurship, Role of NGOs.

Total Periods: 45

TEXT BOOKS:

1. Dr.S.S.Khanka, **"Entrepreneurial Development,"** S. Chand and Company Ltd, Revised Edition, 2012.

2. Madhurima Lall & Shikha Sahai, **"Entrepreneurship,"** Excel Books India, Second Edition 2008.

REFERENCE BOOKS:

1. Nandan, H., **"Fundamentals of Entrepreneurship,"** PHI Learning Pvt. Ltd., 2013, New Delhi, Third Edition 2013.

2. Vasanth De sai, **" The Dy namic s of Entrep reneurial Development and Management,"** Himalaya Publishing House, Fourth Edition 2009.

3. Bholanath Dutta, **"Entrepreneurship Management,"** – Text and Cases, Excel Books, First Edition 2009.

III B.Tech. II Semester

14BT70105: DISASTER MITIGATION AND MANAGEMENT

(OPEN ELECTIVE)

(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	3

PREREQUISITES: Environmental Sciences

COURSE DESCRIPTION: Natural disasters and hazards; Earthquakes; Floods and cyclones; droughts; Landslides; Disaster management.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Explain various types of disasters and mitigation strategies.
2. Analyze and interpret the Guidelines for hazard assessment and vulnerability analysis.
3. Use historical data of disaster losses and inform the people over preparedness.
4. Address the issues due to disasters and provide conclusions over post disaster events for the benefit of the society.
5. Function in multidisciplinary teams for the effective displacement of people during disasters.

Detailed Syllabus:

UNIT - I: INTRODUCTION   (08 periods)

Types of disasters – Natural disasters – Impact of disasters on environment – Infrastructure and development – Concepts of hazards and vulnerability analysis– Hazard Assessment **–** Guidelines for hazard assessment and vulnerability analysis – Basic principles and elements of disaster mitigation

UNIT - II: EARTHQUAKES   (11 periods)

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. Tsunami – Onset, types and causes – Warning – Element at risk – Typical effects – Specific preparedness and mitigation strategies.

UNIT - III: FLOODS AND CYCLONES: (11 periods)

Onset, types, warnings – Elements at risk – Typical effects – Indian floods and cyclones – Hazard zones – Potential for reducing hazards – Mitigation strategies and community based mitigation.

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 - IV: LANDSLIDES   (07 periods)

Onset, types and warning – Causes of landslides – Elements at risk – Indian land slides – Hazards zones – Typical effects – Mitigation strategies and community based mitigation

UNIT - V: DISASTER MANAGEMENT: **(08 periods)**

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.

Total Periods: 45

TEXT BOOKS:

1. V.K. Sharma, **"Disaster Management,"** National Centre for Disaster Management, IIPE, 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.

TEXT BOOKS:

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. R. B. Singh **"Natural Hazards and Disaster Management,"** Rawat Publications, 2009.

3. Pardeep sahni, Alka Dhameja, Uma Medury **"Disaster Mitigation,"** Fourth Edition, PHI Learning Pvt. Ltd., 2011.

4. Sanjay K. Sharma **"Environment Engineering and Disaster Management,"** First Edition, USP Publishers, 2011.

III B.Tech. II Semester

14BT70106: ENVIRONMENTAL POLLUTION AND CONTROL

(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Environmental Sciences

COURSE DESCRIPTION: Introduction; Sources and Effects of Air Pollution; Dispersion of Pollutants and their control; Surface and Ground Water Pollution and control; Soil Pollution and remediation; Management of Municipal Solid Wastes.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Explain about environmental pollution and control.
2. Analyze the major pollutants that causes environmental pollution.
3. Conduct research and select suitable techniques to control pollution.
4. Understand the effects of environmental pollutions on human beings and vegetation.
5. Communicate the methods of management and control of environmental pollution.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO AIR POLLUTION AND DISPERSION OF POLLUTANTS   (08 periods)

Scope – Air Pollutants – Classifications – Natural and Artificial – Primary and Secondary, Point and Non– Point, Line and Area Sources of Air Pollution – Stationary and Mobile Sources – Dispersion of Pollutants – Dispersion Models – Applications.

UNIT - II: EFFECTS AND CONTROL OF PARTICULATES (09 periods)

Effects of Air Pollutants on Man, Material and Vegetation – Global Effects of Air Pollution – Green House Effect, Heat Island, Acid Rains, Ozone Holes – Control of Particulates – Control at Sources – Process Changes – Equipment Modifications – Design and Operation of Control Equipment – Settling Chambers – Centrifugal Separators – Bag Filters, Dry and Wet Scrubbers – Electrostatic Precipitators.

UNIT - III: WATER POLLUTION: (10 periods)

Introduction–Water Quality in Surface Waters – Nutrients – Controlling Factors in Eutrophication–Effects of Eutrophication – Ground Water Pollution – Thermal Pollution – Marine Pollution – Sewage Disposal in Ocean – Types of Marine Oil Pollution – Cleanup of Marine Oil Pollution – Control of

Water Pollution – Case Study on Tanneries – Drinking Water Quality Standards.

UNIT - IV: SOIL POLLUTION   (09 periods)
Soil Pollutants – Sources of Soil Pollution – Causes of Soil Pollution and their Control – Effects of Soil Pollution–Diseases Caused by Soil Pollution – Methods to Minimize Soil Pollution – Effective Measures to Control Soil Pollution – Case Study on Fertilizer.

UNIT - V: MUNICIPAL SOLID WASTE MANAGEMENT   (09 periods)

Introduction – Types of Solid Wastes – Principles of Excreta Disposal – Domestic Solid Waste Production – Collection of Solid Wastes – Transport of Solid Wastes – Management of Solid Wastes – Methods of Land Disposal – Sanitary Landfill – Composting – Incineration.

Total Periods: 45

TEXT BOOKS:

1.   C.S.Rao, **"Environmental Pollution Control Engineering,"** Second Edition, New Age International Pvt Ltd., 2007.

2.   Y.Anjaneyulu, **"Introduction to Environmental Science,"** First Edition, BS Publications., 2009.

REFERENCE BOOKS:

1.   M.N. Rao and H.V.N. Rao, **"Air Pollution,** Nineteenth Edition, Tata McGraw-Hill Education Pvt. Ltd., 2010.

2.   Daniel Vallero, **"Fundamentals of Air Pollution,"** Fifth Edition, Academic Press (Elsevier), 2014.

3.   S.M.Khopkar, **"Environmental Pollution Monitoring and Control,"** Second Edition, New Age International Pvt Ltd., 2007.

4.   S.Deswal and K.Deswal, **"Environmental Science,"** Second Edition, Dhanpat Rai & Co, 2011.

III B.Tech. II Semester

14BT70107: CONTRACT LAWS AND REGULATIONS

(OPEN ELECTIVE)

(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Construction Contracts; Tenders; Arbitration; Legal Requirements; Labour Regulations.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Explain contract documents and tendering processes.
2. Analyze the legal issues in arbitration and in contracts documents.
3. Address the legal issues in collecting taxes.
4. Follow ethics while bidding, sale and purchase of property.
5. Develop and Prepare tender documents as per the standards.

Detailed Syllabus:

UNIT - I: CONSTRUCTION CONTRACTS   (09 periods)

Indian Contracts Act – Elements of Contracts – Types of Contracts – Features – Suitability – Design of Contract Documents – International Contract Document and laws – Standard Contract Document – Law of Torts.

UNIT - II: TENDERS   (09 periods)

Prequalification – Bidding – Accepting – Evaluation of Tender from Technical, Contractual and Financial Points of View – Two Cover System – Preparation of the Documentation – Contract Formation and Interpretation – Potential Contractual Problems – Price Variation Clause – Comparison of Actions and Laws – Subject Matter – Violations.

UNIT - III: ARBITRATION   (09 periods)

Arbitration – Comparison of Actions and Laws –   Agreements – Appointment of Arbitrators – Conditions of Arbitration – Powers and Duties of Arbitrator – Rules of Evidence – Enforcement of Award – Arbitration Disputes – Dispute Review Board.

UNIT - IV: LEGAL REQUIREMENTS: (09 periods)

Legal Requirements for Planning – Property Law – Agency Law – Tax Laws – Income Tax, Sales Tax, Excise and   Custom Duties – Local Government Approval – Statutory Regulations – Insurance and Bonding – Laws Governing Purchase and Sale – Use of Urban and Rural Land – Land Revenue Codes – EMD – Security Deposits – Liquidated Damages.

UNIT - IV: LEGAL REQUIREMENTS: (09 periods)

Legal Requirements for Planning – Property Law – Agency Law – Tax Laws – Income Tax, Sales Tax, Excise and Custom Duties – Local Government Approval – Statutory Regulations – Insurance and Bonding – Laws Governing Purchase and Sale – Use of Urban and Rural Land – Land Revenue Codes – EMD – Security Deposits – Liquidated Damages.

UNIT - V: LABOUR REGULATIONS: (09 periods)

Social Security – Welfare Legislation – Laws Relating to Wages, Bonus and Industrial Disputes – Labour Administration – Insurance and Safety Regulations – Workmen's Compensation Act – Maternity Benefit Act – Child Labour Act – Other Labour Laws.

Total Periods: 45

TEXT BOOKS:

1. G.C.V. Subba Rao **"Law of Contracts I & II,"** Elevennth Edition, S. Gogia & Co., 2011.

2. Jimmie Hinze, **"Construction Contracts,"** Second Edition, Mc Graw Hill, 2001.

REFERENCE BOOKS:

1. Gajaria G.T, Kishore Gajaria, **"Laws Relating to Building and Engineering Contracts in India,"** Fourth Edition, Lexis Nexis Butterworths India, 2000.

2. B. S. Patil, **"Civil Engineering Contracts and Estimates,"** Third Edition, University Press (India) Private Ltd., 2013.

3. Joseph T. Bockrath, **"Contracts and the Legal Environment for Engineers and Architects,"** Seventh Edition, McGraw Hill Education, 2010.

4. Akhileshwar Pathak, **"Contract Law,"** First Edition, Oxford University Press, 2011.

III B.Tech. II Semester
14BT70108: PLANNING FOR SUSTAINABLE DEVELOPMENT
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Introduction to Sustainable Development; Environment; Sciences and Sustainability; Sustainable Development Politics and Governance; Tools, Systems and Innovations for Sustainability; Communication and Learning for Sustainability.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate the knowledge of planning, environment, tools and systems for sustainable development.
2. Analyze the current challenges to sustainability.
3. Use theoretical frameworks and provide solutions to the real world sustainability issues.
4. Conduct awareness of contemporary issues on globalization in terms of sustainability.
5. Give recommendations for the sustainability issues and solutions using a holistic approach.
6. Explain a sense of civic responsibility, including reflection on the student's own role in developing and nurturing sustainable communities.
7. Participate in decision making as individual and responsible for collective decision.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO SUSTAINABLE DEVELOPMENT
(08 periods)
Definition and Concepts of Sustainable Development – Capitalization of Sustainability – National and Global Context – The Millennium Development Goals – Emergence and Evolution of Sustainability and Sustainable Development – Theories of Sustainability – Case Studies.

UNIT - II: ENVIRONMENT, SCIENCES AND SUSTAINABILITY
(08 periods)
Climate Change – Science, Knowledge and Sustainability – Unforeseen Environmental Impacts on Development – Challenges of Sustainable Development – Centrality of Resources in Sustainable Development – Case Studies.

UNIT - III: SUSTAINABLE DEVELOPMENT POLITICS AND GOVERNANCE: **(10 periods)**
Governance and Democracy and Eco–Welfare – Global Civil Society and World Civil Politics – Civic Environmentalism – Policy Responses to Sustainable Development – Economics of Sustainability – Social Responsibility in Sustainability – National Action

UNIT - IV: TOOLS, SYSTEMS AND INNOVATION FOR SUSTAINABILITY
(11 periods)

Need for System Innovation – Transition and Co–Evolution – Theories and Methods for Sustainable Development – Strategies for Eco–Innovation – Ecological Foot Print Analysis – Socio Ecological Indicators – Eco Labels– Policy Programmes for System Innovation – Case Studies

UNIT - V: COMMUNICATION AND LEARNING FOR SUSTAINABILITY
(08 periods)

Role of Emerging Media – Remarkable Design and Communication Art, Activism and the Public Interest – Education for Sustainability – Participation in Decision Making – Critical Thinking and Reflection – Case Studies

Total Periods: 45

TEXT BOOKS:

1.   John Blewitt, **"Understanding Sustainable Development,"** Earth Scan Publications Ltd., Second Edition, 2008.

2. Jennifer A. Elliot, **"An introduction to sustainable development,"** Ear th Scan Publications Ltd., Fourth Edition, 2006.

REFERENCE BOOKS:

1. Peter Rogers, Kazi F Jalal, John A Boyd, **"An introduction to sustainable development,"** Earth Scan Publications Ltd., First Edition, 2006.

2. Simon Dresner, **"The Principles of Sustainability,"** Earth Scan Publications Ltd., Second Edition, 2008.

3. Peter Bartelmus, **"Environment growth and development: The concepts and strategies of sustainability,"** Routledge, Third Edition, 2003.

4. Gabriel Moser, Enric Pol, Yvonne Bernard, Mirilia Bonnes, Jose Antonio Corraliza, Maria Vittoria Giuliani, **"People places and sustainability,"** Hogrefe & Huber Publishers, Second Edition, 2003.

III B.Tech. II Semester
14BT70109: RURAL TECHNOLOGY
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Research & Development; Non Conventional Energy; Community Development; IT Management

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Acquire the knowledge of various nonconventional energy systems and technologies for rural development.
2. Apply the principles of IT for the rural development.
3. Responsible for the development of technologies in rural areas.
4. Unde rstand the im pact of te chnologie s in socie tal and environmental aspects.

Detailed Syllabus:

UNIT - I: RESEARCH & DEVELOPMENT   (09 periods)

India – Ancient Indian Technologies – Rural India Life – Indian Farmer – Role of Science and Technology in Rural Development – Rural Technology and Poverty Eradication – Rural Business Hubs – Technology in improving rural infrastructure – Various organizations related to innovation – Issues of technology transfer: CAPART, NABARD, CSIR, NIF.

UNIT - II: NON CONVENTIONAL ENERGY   (09 periods)

Definition of Energy, Types of alternative sources of energy, Sources of non conventional energy – Solar energy – Solar Cooker – Solar Heater – Biogas – Recycling and Management and Wastes Conservation – Assessment & Production of biomass products & their utilization.

UNIT - III: TECHNOLOGIES FOR RURAL DEVELOPMENT

(09 periods)

Food & Agro based technologies – Tissue culture – Building and Construction technologies – Cultivation and processing of economic plants – Cottage and social Industries.

UNIT - IV: COMMUNITY DEVELOPMENT   (09 periods)

Water conservation – Rain water Harvesting – Drinking water – Environment and Sanitation – Bio fertilizers – Medical and Aromatic plants – Employment generating technologies – Apiculture – Piciculture – Aquaculture.

UNIT - V: IT IN RURAL DEVELOPMENT   (09 periods)

The Role of Information Technology in Rural Areas – Impact of Information Technology in Rural development – Need and Necessity of Technology – Corporate Social Responsibilities – Private sector participation (Activities in different spheres: Employment, Education, Health, Agriculture and Service Sectors) and Saansad Adarsh Gram Yojana (SAGY) – village adop-

tions schemes.

Total Periods: 45

TEXT BOOKS:

1. M.S Virdi, **"Sustainable Rural Technologies,"** Daya Publishing House, New Delhi, First Edition, 2009.

2. S.V. Prabhath & P. Ch. Sita Devi, **"Technology and Rural India,"** Serials Publications, New Delhi, First Edition, 2012.

REFERENCE BOOKS:

1. P. R. S. Murthy, R.C. Chackravarthy, **"Information Technology & Rural Development,"** Pacific Books International, First Edition, 2011.

2. 2. Shivakanth Singh, **"Rural Development Policies and Programmes,"** Northern book centre, New Delhi, First Edition, 2002.

3. L.M.Prasad, **"Principles and Practice of Management,"** Sultan Chand & Sons, New Delhi, Fighth Edition, 2014.

4. Venkata Reddy. K, **"Agriculture and Rural Development Gandhian Perspective,"** Himalaya Publishing House, First Edition, 2001.

III B.Tech. II Semester

14BT60305: ARTIFICIAL INTELLIGENCE AND ROBOTICS

(OPEN ELECTIVE)

(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Artificial Intelligence; Problem solving strategies; Heuristic search, Production systems; Simple facts in logic, Forward and Backward Reasoning; Fuzzy logic and Neural Nets; Concept of learning; Classification and specification of robots; Different Sensing and Vision techniques; Direct and Inverse Kinematics; Dynamics; Programming Languages, VAL-II programming; Applications of Artificial Intelligence in Robotics, Task Planning;

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Impart knowledge on forward, backward and plausible reasoning inherent in them for developing Artificial intelligence and expert systems.
2. Employ effective methods to analyze a robot motion control while executing a specific task.
3. Design and Implement appropriate solutions for search Problems such as playing two person games and for planning problems which involve defining a sequence of actions of a robot.
4. Apply various AI techniques to different robotic sub-problems involving task planning and obstacle avoidance.

Detailed Syllabus:

UNIT - I: ARTIFICIAL INTELLIGENCE & PROBLEM SOLVING
(10 periods)

The Underlying assumption of AI; AI Technique: simple Tic-Tac-Toe program; Problem solving: State space search; Production systems: control strategies, search space control: depth-first, breadth-first search; Heuristic search: Hill climbing, best-first search, branch and bound. Problem Reduction, Constraint Satisfaction End, Means-End Analysis.

UNIT - II: KNOWLEDGE REPRESENTATION & LEARNING
(09 periods)

Knowledge Representation; Predicate Logic: Simple facts in logic, resolution, Natural deduction; Procedural versus Declarative Knowledge; Forward reasoning versus Backward reasoning; Semantic Nets; Frames; slots; conceptual dependency; scripts; Non-Monotonic Reasoning, Probabilistic reasoning, use of certainty factors, fuzzy logic systems & Neural nets: Basic concepts; Concept of learning.

UNIT - III: ROBOTICS –VISION & SENSING   **(08 periods)**

Robotics: Robot Classification, Robot Specification, notation; Sensing: Range sensing: Triangulation; proximity sensing: Inductive, Capacitive and Ultrasonic sensing; touch sensing: tactile sensing, artificial skins; Force and torque sensing: Wrist force sensors; Vision: low-level vision, high-level vision.

UNIT - IV: ROBOT PROGRAMMING & CONTROL   (10 periods)

Direct and Inverse Kinematics: Co-ordinate reference Frames, Rotations, Homogeneous Coordinates; Introduction to arm dynamics; Control: Types of control schemes: Resolved motion control, Adoptive control; Programming: Robot level languages: characteristics, specifications; Task level languages; Language structure: VAL II.

UNIT - V: ROBOT INTELLIGENCE & TASK PLANNING   (08 periods)

Artificial intelligence in Robotics: Goals of AI research; Applications of state space search in robotics; graph search technique; Problem solving and problem reduction; robot learning; Task planning: Modelling, task specification, obstacle avoidance, grasp planning; Expert system.

Total Periods: 45

TEXT BOOKS:

1. E. Rich and K. Knight, **"Artificial intelligence,"** Tata Mc Graw Hill, Second Edition, 1992.

2. K.S. Fu, R.C. Gonzalez, C.S.G. Lee, **"Robotics: Control, Sensing, Vision, and Intelligence,"** Mc Graw Hill, International Edition, 1987.

REFERENCE BOOKS:

1. Mikell P. Groover, **"Industrial Robotics, Technology, Programming, and Applications,"** Tata Mc Graw Hill, Nineth reprint 2011.

2. D.W. Patterson, **"Introduction to AI and Expert Systems,"** PHI, 1992.

3. N.J. Nilsson, **"Principles of AI,"** Narosa Publ. House, 2000.

4. George Luger, **"Al-Structures and Strategies for and Strategies for Complex Problem solving,"** Pearson Educations, Fourth Edition, 2002.

III B.Tech. II Semester
14BT60306: GLOBAL STRATEGY AND TECHNOLOGY
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Introduction to strategic management; strategic management process; principles of good strategy; globalisation; globalisation strategies; research & development strategies; technology management and transfer; significance; elements of transfer process; corporate governance; the Indian scenario.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Decide upon a macroscopic management strategy to optimize the impact of decisions with limited resources.

2. Identify the impact of globalization in a given engineering scenario. Participate in elementary discussions on corporate governance.

3. Analyze an industrial Engineering problem and layout research plan to meet the needs. Identify the crucial stages needed to ensure smooth transfer of technology from concept stage.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO STRATEGIC MANAGEMENT
(09 periods)

Definitions; Classes of decisions; Levels of strategy; Core competence; Strategic intent and stretch; Approaches to strategy making; Roles of different strategists; strategic management process; Benefits and relevance of strategic management; limitations and misgivings; Principles of good strategy growing relevance of strategic management in India, TQM and strategic management.

UNIT - II: GLOBALISATION
(09 periods)

Meaning and dimensions; Stages of globalisation; Essential conditions for globalisation; Competitive advantage of Nations; Globalisation of Indian business; Factors favouring Globalisation; Globalisation strategies.

UNIT - III: RESEARCH & DEVELOPMENT STRATEGIES (09 periods)

Introduction, Concept, Evolution of R & D Management, R & D as a business, R & D and competitive advantage, Integration of R & D, Elements of R & D strate gie s, Selection of R & D str ate gie s, Implementation strategies, R & D trends, Responses to changes.

UNIT - IV: TECHNOLOGY MANAGEMENT AND TRANSFER
(09 periods)

TECHNOLOGY MANAGEMENT: Introduction, Definition of Technology, Components, Features, Classification of technology, Concept of technology management, Nature of technology management, Drivers of MOT, Significance, Scope of MOT, Responding to technology challenge.

TECHNOLOGY TRANSFER: Introduction, Definition, Classification, Significance, Elements of transfer process, Types of technology transfer, package, Modes of transfer, Channels of technology flow, Routes of

technology transfer, Effectiveness of technology transfer.

UNIT – V: CORPORATE GOVERNANCE: THE INDIAN SCENARIO
(09 periods)

Emergence of corporate governance in India and the landmarks, corporate governance models, Codes and status in India, Indian corporate governance – Role and Responsibilities of Regulators and the Board of Directors, Corporate Governance: Specific issues in India, Corporate Governance issues in Family – owned business in India, Corporate Governance and the Indian ethos.

Total periods: 45

TEXT BOOKS:

1. Francis Cherunilam, **"Statregic Management,"** Himalaya Publishing House, Third Edition, 2002.

2. C .S.G.Krishnamachar yulu and Lalitha R am ak rishnan , **"Management of Technology, Statregic Management,"** Himalaya Publishing House, Second Edition, 2012.

REFERENCE BOOKS:

1. White and Bruton, **"The management of Technology and innovation; a strategic approach,"** Cengage Learning, First Edition, 2007.

2. S.K.Mandak, **"Ethics in business and Corporate Governance,"** TMH, Second Edition, 2012.

III B.Tech. II Semester

14BT60307: INTELLECTUAL PROPERTY RIGHTS& MANAGEMENT
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	3

PREREQUISITES: Nil

COURSE DESCRIPTION: Protection of ideas; innovation and artistic endeavors; Acts and procedure related to patents; trademarks; passing off; copy right; design registration; trade secrets and cyber laws; case studies in each.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. prepare documents and fill applications needed for filing a patent, design, copy right and trademark.
2. ensure smooth transition from concept to final product.
3. exercise discretion in following ethical aspects in dealing with intellectual property rights.

Detailed Syllabus:

UNIT - I: OVERVIEW OF INTELLECTUALPROPERTY RIGHTS
(09 periods)

Introduction and importance of intellectual property rights (IPRs), types of intellectual property, International scenario in IPR: WIPO, WTO, TRIPS, international and national patent acts: United States of America patent act, United Kingdom patent act, India patent act, recent amendments in India patent act 1972.

UNIT - II: PATENTS   (09 periods)
Introduction, Basic concepts, object and value of patent law, advantages of patent to inventor, patentable inventions, Not patentable inventions, overview of patent procedure, Bio technology patents, patents on computer program, patent rights on micro organism, plant breeding and breeders right, protection of bio diversity, protection of traditional knowledge, infringement of patents and remedy for infringement.

UNIT - III: TRADEMARKS   (09 periods)
Trade Marks: Basic concepts, definition, functions, kinds of trademarks: service trademarks, collective trademarks, certification trademarks, textile trade marks, registrable and non registrable trademarks, registration of trademarks, examination process, establishing trade mark right, good will, infringement and action for trademarks, passing off, trade mark and eco label, comparison with patents industrial design and copy right.

UNIT - IV: INDUSTRIAL DESIGN, TRADE SECRETS, CYBER LAWS
(09 periods)

Industrial Design: Basic concepts, scope and nature of rights, process of registration rights, rights after registration, transfer of interest or rights, reliefs and remedies and action for infringement of rights, appeals..

Trade Secrets: Definition, significance, tools to protect trade secrets in India

Cyber laws: Co relation to intellectual property

UNIT - V: COPY RIGHTS   **(09 periods)**

Copy Rights: Introduction, nature and scope, subject matter, related or allied rights, works in which copy rights subsists, registration of copy rights, conferred by copy right, copy right protection in India, transfer of copy rights, right of broad casing organizations and of performer, computer software.

Total Periods: 45

TEXT BOOKS:

1. P.Narayan, **"Intellectual Property Law,"** Eastern Law House, New Delhi and Kolkata, 2005,

2.   Deborah E. Bouchoux, **"Intellectual Property Rights,"** Cengage Learning, India Edition, 2011.

REFERENCE BOOKS:

1. Bainbridge David, **"Intellectual Property Rights: Key to New Wealth, National Research Development Corporation,"** Pearson Education, New Delhi.

2. W.R.Cornesh, **"Intellectual Property Rights: Patent, Copy Right, Trade Mark, Allied Rights,"** Universal law publishing private limited, Delhi, 2001.

3. S.R. Myneni, **"Law of Intellectual Property,"** Asia law house, Hyderabad 2001.

4. Prabuddha Ganguly, **"Intellectual Property Rights: Unleasing Knowledge Economy,"** TMH New Delhi, First Edition, 2001.

III B.Tech. II Semester
14BT60308: MANAGING INNOVATION AND ENTREPRENEURSHIP
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Evolution of entrepreneurship from economic theory Managerial and entrepreneurial competencies; Concepts Shifting Composition of the Economy Purposeful Innovation & 7 Sources of Innovative Opportunity The Innovation Process; Innovative Strategies; Entrepreneurial Motivation; Entrepreneurs versus inventors; Ethics and International Entrepreneurship; Strategic Issues in International Entrepreneurship; Problem solving Innovation and Diversification.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Define, explain and illustrate theories of business innovation and entrepreneurship, the evolution of industries and economies, and the roles of Entrepreneurs.
2. Develop a comprehensive and well structured business plan for a new venture.
3. Present a persuasive business plan to potential investors or to internal stakeholders and effectively answer probing questions on the substance of the plan; and
4. Work effectively in multidisciplinary, cross-cultural teams, towards Development of a Team Project.

Detailed Syllabus:

UNIT - I: ENTREPRENEURSHIP (07 periods)

Introduction to Entrepreneurship: Evolution of entrepreneurship from economic theory; Managerial and entrepreneurial competencies, entrepreneurial growth and development.

UNIT - II: CREATIVITY AND INNOVATION (11 periods)

Creativity and Innovation: Concepts Shifting Composition of the Economy; Purposeful Innovation & the 7 Sources of Innovative Opportunity; The Innovation Process; Innovative Strategies: Strategies that aim at introducing an innovation, innovation & entrepreneurship, planning - incompatible with Innovation & entrepreneurship.

UNIT - III: THE INDIVIDUAL ENTREPRENEUR (07 periods)

Entrepreneurial Motivation: Need for continuous learning & relearning; Acquiring Technological Innovation Entrepreneurial motivation (nAch story);

Achievement Motivation in Real life- Case Study. Entrepreneurs versus inventors.

UNIT - IV: INTERNATIONAL ENTREPRENEURSHIP OPPORTUNITIES (11 periods)

International Entrepreneurship: Concepts and Nature of International Entrepreneurship, The changing International environment, Ethics and In-

ternational Entrepreneurship, Entrepreneurial entry into international business, strategic issues in International Entrepreneurship.

UNIT - V: CREATIVE PROBLEM SOLVING　　　　(09 periods)
Problem Identification and Problem Solving: Problem Identification. Problem solving Innovation and Diversification.

Total Periods: 45

TEXT BOOKS:

1.　Martin, M.J. **"Managing Innovation and Entrepreneurship in Technology based Firm,"** John Wiley Interscience, 1994.

2.　Ettlie, J.E. **"Managing Technology Innovation,"** John Wiley & Sons, 2000.

3.　R ober t D Hisr ich., Michae l P Pe te rs., Dean A Shepherd,**"Entrepreneurship,"** The McGraw-Hill Companies, Sixth Edition, 2011.

REFERENCE BOOKS:

1.　Christensen, C. M. and Raynor, **"M. E. The Innovators Solution: Creating and Sustaining Successful Growth,"** Boston, MA: Harvard Business School Press, (2003).

2.　Drucker P. F., **"Innovation and Entrepreneurship,"** New York: Harper, 1985.

3.　Harvard Business Review on Innovation (Collection of articles), Harvard Business School Press (2001).

4.　Harvard Business Review on Entrepreneurship (Collection of articles), Harvard Business School Press (1999).

5.　Rogers E.M., **"Diffusion of Innovations,"** New York: Simon and Schuster, Fifth Edition, 2003.

6.　Drucker P. F. **"The Discipline of Innovation,"** Harvard Business Review, May 2000. (Originally published 1985, May-June).

III B.Tech. II Semester
14BT60309: MATERIAL SCIENCE
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: C ourses on "Engine er ing C he mistry " and "Engineering Physics".

COURSE DESCRIPTION: Structure and Bonding in metals; Steels ,Cast Irons and Non Ferrous alloys; Material Selection for conductors, Insulators and semi conductors; Strengthening mechanisms of metals; Plastics and Ceramics as Insulators; AC and DC properties of Insulators; Semiconductors and Magnetic materials; Composite materials in Electrical and Electronics engineering, Material Selection and manufacturing of Optical fibers.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Understand how materials are formed and their classification based on atomic arrangement.

2. Illustrate how the design of the various types of steels, cast Irons and Non ferrous alloys influence various engineering applications.

3. Understand the basic difference in properties of various conductors, Insulators and Semiconductors and application of various advanced materials for different branches of Engineering.

DETAILED SYLLABUS:

UNIT - I: INTRODUCTION TO MATERIALS SCIENCE   (07 periods)

Structure of metals: Bonds in Solids – Metallic bond - crystallization of metals, grain and grain boundaries, effect of grain boundaries on the properties of metal / alloys – determination of grain size.

Constitution of alloys: Necessity of alloying, types of solid solutions, Hume Rotherys rules, intermediate alloy phases, and electron compounds.

UNIT - II: CAST IRONS , STEELS & NON-FERROUS METALS

**   (12 periods)**

Structure and properties of White Cast iron, Malleable Cast iron, grey cast iron, Spheriodal graphite cast iron, Alloy cast irons. Classification of steels, structure and properties of plain carbon steels. Structure and properties of Copper and its alloys, Aluminum and its alloys.

UNIT - III: ELECTRIC CONDUCTORS & INSULATORS   (12 periods)

Type of materials selected for conductors, Insulators and semi conductors. Introduction to ceramics- Bonding and microstructure-DC properties of ceramic materials–AC properties– mechanical properties -

Ceramics as Conductors, Insulators and capacitors, introduction to Plastics-DC properties-AC properties-mechanical properties.

UNIT - IV: SEMICONDUCTORS AND MAGNETIC MATERIALS

**   (09 periods)**

Fabrication of Semiconductors-Producing a silicon wafer-Lithography and Deposition-Packaging of semiconductors materials-Types of magnetic

materials- Measuring magnetic properties-Application of soft magnetic materials in Electromagnets and relays, AC transformers, Generators and motors.

UNIT - V: ADVANCED MATERIALS AND APPLICATIONS (05 periods)
Composites – Fiber reinforced, Metal Matrix, Ceramic Matrix – properties and applications; Ceramics – Alumina, Zirconia, Silicon Carbide, Sialons, Reaction Bonded Silicon Nitride(RBSN), Glasses– properties and applications, manufacturing of Optical fibers.

Total Periods: 45

TEXT BOOKS:

1. Kodigre V D, **"Material Science and Metallurgy,"** Everest Publishing House, Pune, Thirty First Edition, 2011.

2. Ian.P.Jones, **"Material Science for Electrical and Electronic Engineers,"** Oxford University Press, New Delhi,2000

REFERENCE BOOKS:

1. V. Raghavan, **"Physical Metallurgy: Principles and Practices,"** PHI, New Delhi, Second Edition, 2006.

2. William. D. Callister, **"Materials Science & Engineering-An Introduction,"** John Wiley and sons, New Delhi, Sixth Edition, 2002.

3. A.J. Dekkar, **"Electrical Engineering Materials,"** PHI, New Delhi, 1970.

III B.Tech. II Semester

14BT60502: ENGINEERING SYSTEMS ANALYSIS AND DESIGN

(OPEN ELECTIVE)

(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Nil.

COURSE DESCRIPTION: Overview of theSystems Process; Technologies for systems; System Development Life Cycle; system Analysis and Modeling; levels of management; Project Management; Systems Implementation and importance of UMLPrototyping; Maintaining and Managing the Systems output Process.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Gain knowledge on:
    - Systems Process and System Design
    - Systems Analysis and Modeling
    - System Development Life Cycle
    - Design Management and Maintenance Tools.
2. Apply the CASE Tools for System Process and estimation the given models.
3. Design, Develop and implement new Techniques for modeling the systems.
4. Work effectively as team member on projects
5. Manage and Maintain the System Process.

Detailed Syllabus:

UNIT - I: INTRODUCTION   (09 periods)

Introduction - Systems, Types of systems,integrating technologies for systems, Need for system analysis and design, Role of the systems analyst, the system development life cycle, CASE tools for analysis and design.

UNIT - II: ANALYSIS AND MODELING ORGANIZATIONAL SYSTEMS   (09 periods)

Organization as system, System Analysis, Depicting systems graphically, Use case Modeling, levels of management, organizational culture.

UNIT - III: PROJECT MANAGEMENT   (09 periods)

Proje ct initiation, Problem in or ganization, De te rm ining feasibilities,ascertaining hardware and software needs,identifying,

forecasting, comparing costs and benefits, activity planning and control, managing the project.

UNIT - IV: OBJECT ORIENTED ANALYSIS AND DESIGN USING UML   (09 periods)

Object oriented analysis and design- Introduction, Object modeling, Dynamic modeling, functional modeling, packages and other UML artifacts, the importance of using UML for modeling.

UNIT - V: DESIGNING EFFECTIVE OUTPUT   **(09 periods)**

Output design objectives, relating output content to output method, realizing how output bias affects users, designing output for display, Case studies- Designing a web site management, online exam management.

                                          Total Periods: 45

TEXT BOOK:

1. Kenneth E.Kendall and Julie E. Kendall, **"System analysis and Design,"** Eighth Edition, Pearson Education, India, 2011.

REFERENCE BOOKS:

1. Dennis, Wixom, Roth **"systems analysis and Design,"** Fifth Edition, John Wiley. 2012.

2. Shelly, Rosenblatt, **"Systems analysis and Design,"** Eighth Edition, Cengage Learning, 2012.

III B.Tech. II Semester
14BT71005: MICROELECTRO MECHANICAL SYSTEMS
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	3

PREREQUISITES: Basic knowledge in Physics.

COURSE DESCRIPTION:

Overview of Micro Electro Mechanical Systems (MEMS); scaling laws; working principles of microsensors and microactuators; materials; microfabrication processes; packaging of Microsystems.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on MEMS devices, scaling laws, microsensors and microactuators.

2. Identify the suitable materials, fabrication techniques, packaging methodologies to develop MEMS devices.

Detailed Syllabus:

UNIT - I: OVERVIEW OF MEMS AND SCALING LAWS (09 periods)

Introduction, MEMS and microelectronics, miniaturization, applications of MEMS in the automotive industry and in other industries.
Scaling laws of miniaturization: Introduction to scaling, scaling in: geometry, rigid- body dynamics, electrostatic forces, electromagnetic forces, Electricity, Fluid mechanics, Heat transfer.

UNIT - II: WORKING PRINCIPLES OF MICROSYSTEMS(09 periods)

Microsensors, acoustic wave sensors, biomedical and biosensors, chemical sensors, pressure sensors, thermal sensors. Microactuation: actuation using thermal forces, shape-memory alloys, piezoelectric crystals, electrostatic forces. MEMS with microactuators, microgrippers, microm otors, micr ovalves, m icropum ps. Microaccele rom eter s, microfludics.

UNIT - III: MATERIALS FOR MEMS AND MICROSYSTEMS
(09 Periods)

Substrate and wafers, silicon as a substrate material, silicon compounds, silicon piezoresistors, gallium arsenide, quartz, piezoelectric crystals, polymers, carbon nano tube (CNT), development of CNTs, application of CNTs.

UNIT - IV: MEMS FABRICATION PROCESS AND MICRO-MANUFAC-TURING
(09 periods)

Photolithography, ion implantation, diffusion, oxidation, chemical vapor deposition, physical vapor deposition, deposition by epitaxy, etching, bulk micromanufacturing, surface micromanufacturing, LIGA process.

UNIT - V: MEMS PACKAGING
(09 periods)

Introduction to microsystem packaging, objectives and general considerations in packaging design, three levels of microsystem packaging, interfaces in microsystem packaging, packaging technologies, three-dimensional packaging, selection of packaging materials, signal

mapping and transduction, Design case: Pressure sensor packaging.

Total Periods: 45

TEXT BOOK:

1. Tai-Ran Hsu, **"MEMS & Microsystems, Design and Manufacture,"** McGraw Hill Education (India) Pvt. Ltd., 2002.

REFERENCE BOOKS:

1. G.K.Ananthasuresh, K.J.Vinoy, **"Micro and Smart Systems,"** Wiley India, First Edition, 2010

2. Nitaigour Premchand Mahalik, **"MEMS,"** McGraw Hill Education (India) Pvt. Ltd., eighth reprint, 2013.

14BT61205: **BIO INFORMATICS**
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	**70**	**100**	**3 1 - 3**

PREREQUISITES: Nil

COURSE DESCRIPTION: Introduction to Bioinformatics; Biology and Information; Sequence alignment and dynamic programming; Primary databases; Secondary databases and their use in Bioinformatics.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on concepts of biological databases, Genome and proteome.
2. Analyze biological database management system.
3. Create, select and apply appropriate techniques and tools to manage the biological data.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO BIOINFORMATICS   (08 periods)
Internet basics, Scope of bioinformatics, elementary commands and protocols, ftp, telnet, http, primer on information theory, introduction to perl and bioperl.

UNIT - II: BIOLOGY AND INFORMATION   (07 periods)
Bioinformatics, Computers in Biology and Medicine, The Virtual Doctor, Biological Macromolecules as Information Carriers.

UNIT - III: SEQUENCE ALIGNMENT AND DYNAMIC PROGRAMMING
(10 periods)
Heuristic alignment algorithms, global sequence alignments- Needleman-Wunsch algorithm, local sequence alignments- smith-waterman algorithm, amino acid substitution matrices- PAM and BLOSUM, Multiple sequence alignment and phylogenetic analysis.

UNIT - IV: PRIMARY DATABASES AND THEIR USE   (11 periods)
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 - V: SECONDARY DATABASES   (09 periods)
Introduction to secondary databases- organization and management of databases Swiss-Prot, Uniprot and PIR, Introduction to biochemical data-

bases-organization and Management of databases, KEGG, ExPASy, BRENDA.

                                    Total Periods: 45

TEXT BOOKS:
1. David W. Mount **"Bioinformatics: Sequence and Genome Analysis,"** CSHL Press, Second Edition, 2005.

REFERENCE BOOKS:

1. Hooman H. Rashidi and Lukas K. Buehler, **"Bioinformatics Basics, Applications in Biological Science and Medicine,"** CRC Press, Taylor & Francis Group, Second Edition, 2005.

2. Rastogi S. C ., Nam itaMendiratta, Par ag R astogi, **"Bioinformatics: Methodsand Applications: Genomics, Proteomics and Drug Discovery,"** PHI Learning Pvt. Ltd., Third Edition, 2011.

III B.Tech. II Semester
14BT61206: CYBER SECURITY AND LAWS
(OPEN ELECTIVE)
(Common to CSE, CSSE, IT and ME)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	3

PREREQUISITES: Nil

COURSE DESCRIPTION: Cyber Crimes and Indian IT Act; Cyber Offenses; Tools and Methods used in Cyber Crime; Phishing ad Identity Theft; Indian and Global Perspective on Cyber Crimes and Cyber Security; Organizational Implications on Cyber Security; IPR Issues; Cyber Crime and Terrorism; Cyber Crime Illustrations.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge in Cyber security, Cyber crimes and its related laws in Indian and Global Act.
2. Analyze the legal perspectives and laws related to cyber crimes in Indian context.
3. Apply security and privacy methods in development of modern applications and in organizations to protect people and to prevent cyber crimes.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO CYBER CRIMES   (09 periods)

Introduction, Definition, Origin, Cyber Crime and Information Security, Cyber Criminals, Classifications of Cyber Crimes, The Legal Perspectives and Indian Perspective, Cyber Crime and Indian ITA 2000, Global Perspective on Cyber Crimes.

Cyber Offenses: Introduction, Criminals Planning on Attacks, Social Engineering, Cyber Stalking, Cyber Café and Crimes, Botnets.

UNIT - II: TOOLS AND METHODS USED IN CYBER CRIME

(09 periods)

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan horses and Backdoors, Steganography, DoS and DDoS attacks.

Phishing and Identity Theft: Introduction, Phishing, Identity Theft (ID Theft).

UNIT - III: CYBER CRIMES AND CYBER SECURITY - LEGAL PERSPECTIVES   (08 periods)

Introduction, Cyber Crime and the legal landscape around the world. Cyber Laws in Indian Context, The Indian IT Act, Challenges to Indian Law and Cyber Crime Scenario in India, Consequences of not addressing the weakness in IT Act, Digital Signatures and the Indian IT Act, Cyber Crime and Punishment, Cyberlaw, Technology and Students in India Scenario.

UNIT - IV: CYBER SECURITY-ORGANIZATIONAL IMPLICATIONS
(10 periods)

Introduction, Cost of Cyber Crimes and IPR issues, Web Threats for Organizations – Evils and Perils, Security and Privacy Implications from Cloud Computing, Social Media Marketing-Security Risks and Perils for Organi-

zations, Social Computing and Associated Challenges for Organizations, Protecting People's Privacy in Organization, Organizational Guidelines for Internet Usage, Safe Computing and Usage Policy, Incident Handling and Best Practices, Media and Asset Protection.

UNIT - V: CYBER TERRORISM AND INFORMATION WARFARE
(09 periods)

Introduction, Intellectual Property in the Cyber Space, the Ethical Dimension of Cyber Crimes, the Psychology, Mindset and Skills of Hackers and Cyber Criminals, Sociology of Cyber Criminals, Information Warfare.

Cyber Crime Illustrations: Indian Banks lose Millions of Rupees, Justice vs. Justice, Parliament Attack, The Indian case of online Gambling, Bank and Credit card related frauds, Purchasing goods and services scam, Nigerian 419 scam.

Total Periods: 45

TEXT BOOK:

1. Nina Gobole , Sunit Be lapure , **" Cy ber Security : Understanding Cyber Crimes, Computer Forensics and Legal Perspectives,"** Wiley India, First Edition, 2011.

REFERENCE BOOKS:

1. Ferrara et al., **"Cyber Law: Text and Cases,"** Cengage Learning, ThirdEdition, 2012.

2. Vivek Sood, **"Cyber Law Simplified,"** Tata McGraw-Hill, First Edition, 2012.

3. Prashant Mali, **"Cyber Law and Cyber Crimes,"** Snow White Publications Pvt. Ltd., First Edition, 2013.

III B.Tech. II Semester
14BT61221: OOAD AND DATA MINING LAB

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PART-A: OOAD

PREREQUISITES: A Course on "Object Oriented Analysis & Design"

COURSE DESCRIPTION: Modeling case studies; Automated Teller Machine; Library Information System; Online Ticket Reservation system; Point of sales etc.,

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Apply Unified Modeling Language to design software system.
2. Analyze the static and dynamic aspects of software system.
3. Model the design for given set of requirements.
4. Develop UML models for real world applications.

Case studies given below should be Modeled using Visual Modeling tools in different views i.e Use case view, logical view, component view, Deployment view.

List of Experiments:

CASE STUDY 1:

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 2:

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 back to 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 3: 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 4: 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 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, and 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: 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.

CASE STUDY 7: TWO FLOOR ELEVATOR SIMULATOR

The elevator has the basic function that all elevator systems have, such as moving up and down, open and close doors, and of course, pick up passengers. The elevator is supposed to be used in a building having floors numbered from 1 to MaxFloor, where the first floor is the lobby. There are car call buttons in the car corresponding to each floor. For every floor except for the top floor and the lobby, there are two hall call buttons for the passengers to call for going up and down. There is only one down hall call button at the top floor and one up hall call button in the lobby. When the car stops at a floor, the doors are opened and the car lantern indicating the current direction the car is going is illuminated so that the passengers can get to know the current moving direction of the car. The car moves fast between floors, but it should be able to slow down early enough to stop at a desired floor. When an elevator has no requests, it remains at its current floor with its doors closed.

In order to certificate system safety, emergency brake will be triggered and the car will be forced to stop under any unsafe conditions.

CASE STUDY 8: HOME APPLIANCE CONTROL SYSTEM

A home appliance control system (HACS) is a system which provides various services to remotely operate on home appliances, such as microwave oven, TV, and garage door etc through remote devices such as mobile phone, desktop and palm-top. A home appliance control system (HACS) is a system which is controlled by a remote system such as a mobile phone or a palm-top, and at the same time controls, monitors and coordinates home appliances such as air conditioner, microwave oven, garage doors, TV set, VCR, audio controller, indoor/outdoor lights, water sprinkler, home security system, bath tub controller, etc. In order to activate home appliances and to allow for different ways of cooking, the HACS needs mechanisms for communication between the different devices in the system, and for coordination among the various processes running on such devices. The system administrator of the HACS system has the ability to add a new appliance or delete an existing one. The system administrator has the ability to add a new remote device and configure it with HACS or delete an existing one when it is not used. Also the system administrator can create an account for a new user or delete existing account if it is no longer used.

PART-B: DATA MINING

PREREQUISITES: Courses on "Database Management Systems Lab and Data warehousing and data mining".

COURSE DESCRIPTION: Hands-on experience on Data preprocessing techniques; Mining frequent patterns; classification and clustering techniques using R and Weka open source machine learning tools.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Analyze and predict the information for forecasting applications.

2. Identify and design suitable algorithms to mine knowledge from real-time databases.

3. Apply Weka and R tools to extract interesting patterns from large databases.

List of Experiments:

I. Experiments on Weka 3.7.5:

Credit Risk Assessment: 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.

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 (Down load from web).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 Turkey). 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:

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.

2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.

3. 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.

4. 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?

5. Is testing on the training set as you did above a good idea? Why or Why not?

6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what cross-validation is briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why?

7. 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.

8. 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.)

9. sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant w ho has bad cre dit (case 2). Instead of counting the misclassifications 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. 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?

11. 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?

12. (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.

II. Experiments on R 2.15.1:

13. Create an EMP Dataset in R environment and perform the following functions

i. Display the EMP dataset with all rows and columns

ii. Edit the dataset and perform few manipulations and display the updated dataset

iii. Perform Data Exploration functions on EMP Dataset.

iv. Generate various visualizations such as Plot, Scatter plot matrix etc.

REFERENCE BOOKS:

1. Grady Booch, James Rum Baugh, Ivar Jacobson, **"The Unified Modeling Language User Guide,"** Second Edition, 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.

6. Ian. H. Witton and Eibe Frank **"Data Mining: Practical Machine Learning Tools and techniques,"** Second Edition, Elsevier Publication, 2005.

7. Joseph Adler, **"R in a Nutshell,"** First Edition, O'Reily Publishers,

III B.Tech. II Semester
14BT61222: **WEB PROGRAMMING LAB**
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
25	**50**	**75**	**- - 3 2**

PREREQUISITES: Cour ses on "Problem Solving and Computer Programming".

COURSE DESCRIPTION: Hands-on experience on HTML; HTML5; CSS; JavaScript; JQuery; PHP; MySQL; XML and AJAX.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript, JQuery, XML, AJAX, PHP and MySQL.
2. Apply client-server principles todevelop scalable and enterprise web applications.

List of Experiments:

1. Design the following static web pages required for an online book store web site.

A. Home Page:

The Home page must have the following three frames:

Top frame: Logo and the book store name and links to Home page, Latest arrivals, Best sellers, Contact us and Search.

Left frame: At least four links for navigation, which will display the books catalogue relevant to engineering disciplines. For e.g. when the link "Computers" is clicked, the catalogue relevant to computer science books will be displayed in the right frame.

Right frame: The pages of navigated links in the left and top frame must be loaded in the right frame. Initially it will load the Home page that can include the description of the book store, sign-in and create account information.

B. Catalogue Page:
The catalogue page should display the following details of books available

in the web site. The details are as follows:

a. Snap shot of cover page   b. Title of the text book
c. Author name   d. Publisher
e. Price   f. More details link.

Logo	Name of the Book Store		
Home	Latest Arrivals	Best Sellers	Contact Us Search
Computers Electronics Electrical Bio-Tech	**HTML5 Black Book** Kogent Learning Solutions Dreamtech Press Rs. 570/-	More Details	
	Beginning PHP and MySQL 4th Edition W Jason Gilmore Apress Rs. 520/-	More Details	

C. Registration Page:

Design the Registration page with the following fields and link it to create an account link.

a. First Name   b. Last Name   c. Gender

d. Date of Birth   e. Username   f. Password
g. Confirm Password   h. Address   i. Postal Code
j. Mobile No.   k. Email-Id

2.

a. Design a web page to store username and password information using the local storage concept.

b. Design a web page to store employee information including Name, Emp. Id, Department, Salary and Address on a client's machine using a real SQL database.

3. Apply the following styles to all web pages of online book store web site.

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, Layers and Positioning elements.

4. Write a JavaScript/JQuery code to validate the following fields of the Registration web page.

a. First Name/Last Name - should contain only alphabets and the length should not be less than 8 characters.

b. Username - It should contain combination of alphabets, numbers and _. It will not allow spaces and special symbols.

c. Password - It should not less than 8 characters in length.

d. 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.

e. Postal Code: It must allow only 6 digit valid number.

e. Mobile No. - It should allow only numbers and total number of digits should be equal to 10.

f. E-mail id - It should allow the mail id with the following format:

Ex. mailid@domainname.com

5. Design a web page with the following features using HTML5, JavaScript and JQuery

a. Displaying of images with Custom animated effects

b. Playing of selected video from the list of loaded videos

c. Showing the animated text in increasing and decreasing font size

d. Changing the size of the area in a web page using DIV tag

d. Hides and Shows elements on web page.

6.

a. Deploy and navigate web pages of online book store using WAMP/ XAMPP web server.

b. Write a PHP program to red user name and favorite color from the HTML form. Display the name of the user in green color and sets user favorite color as a background for the web page.

7. Write a PHP code to read the username and password entered in the Login form of the online book store and authenticate with the values available in cookies. If user enters a valid username and password, welcome the user by username otherwise display a message stating that, entered details are invalid.

8. Write a PHP code to read user details entered through the registration web page and store the same into MySQL database.

9. Write a PHP code for storing books details like Name of the book, author, publisher, edition, price, etc into MySQL database. Embed a PHP code in catalogue page of the online book store to extract books details from the database.

10. Write an XML file to store book details including:

a. Title of the book   b. Author of the book   c. ISBN number

d. Publisher Name   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 XSLT.

The contents should be displayed in a table format. The header of the table should be in color grey and the author names should be displayed in red color, bold and capitalized. Use appropriate colors for remaining fields.

11. Design a web page to reload some portion of the web page content using XMLHttpRequest object.

IV B.Tech. I Semester

14BT71201: MOBILE APPLICATION DEVELOPMENT

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Object Oriented Programming through Java".

COURSE DESCRIPTION: Knowledge on Mobile platforms; Designing of Mobile User Interface and tools for developing user interface; Introduction to Android; Understanding Activities; Linking Activities using Intents; Creating the User Interface Programmatically; Views; Menus; Database Storage; SMS; e-mail; Displaying Maps; Building a Location Tracker Web Services Using HTTP, Sockets Programming, Communication between a Service and an Activity; Introduction to iOS and Windows Phone 7.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on
   a. Mobile platforms and Mobile User Interface
   b. Android Activities and Intents
   c. Messaging, Networking, Location based Services, Android Services
   d. Basics of iOS and Windows phone 7.
2. Demonstrate problem solving skills to design and develop solutions for real world problems with android mobile applications.

Detailed Syllabus:

UNIT - I: MOBILE APP OR WEBSITE, MOBILE USER INTERFACE DESIGN, ANDROID PROGRAMMING   (08 periods)

Mobile Web Presence, Mobile Applications, Marketing, App as a Mobile Web App, Effective Use of Screen Real Estate, Understanding Mobile Application Users, Understanding Mobile Information Design, Understanding Mobile Platforms, Using the Tools of Mobile Interface Design.

What is android, obtaining the required tools, First Android Application, Anatomy of an Android Application.

UNIT - II: ACTIVITIES, INTENTS AND ANDROID USER INTERFACE   (09 periods)

Understanding Activities, Linking Activities using Intents, Calling Built-In Applications using Intents, Displaying Notifications, Understanding the Components of a Screen, Adapting to Display Orientation, Managing Changes to Screen Orientation, Utilizing the Action Bar, Listening for UI Notifications.

UNIT - III: DESIGNING USER INTERFACE WITH VIEWS, DISPLAYING PICTURES AND MENUS WITH VIEWS, DATA PERSISTENCE   (10 periods)

Basic Views, Picker Views, List Views, Using Menus with Views, Some Additional Views, Saving and Loading User Preferences, Persisting Data to Files, Creating and Using Databases.

UNIT - IV: MESSAGING, LOCATION-BASED SERVICES, AND NETWORKING

(09 periods)

SMS Messaging, Sending e-mail, Displaying Maps, Getting Location Data, Monitoring a Location, Consuming Web Services Using HTTP.

UNIT - V: DEVELOPING ANDROID SERVICES, GETTING STARTED WITH IOS, AND WINDOWS PHONE 7   (09 periods)

Creating Your Own Services, Establishing Communication between a Service and an Activity, Binding Activities to Services, Understanding Threading.

iOS Tools, iOS Project, Debugging iOS Apps, Objective-C Basics, Hello World App, Building the Derby App in iOS.

Windows Phone 7 Metro, Application Bar, Tiles, Tombstoning, Tools, Windows Phone 7 Project, Building the Derby App in Windows Phone 7.

Total Periods: 45

TEXT BOOKS:

1. Wei-Meng Lee, John, **"Beginning Android™ 4 Application Development",** Wiley & Sons Inc., First Edition, 2012.

2. Jeff McWherter, Scott Gowell, **"Professional Mobile Application Development,"** Wiley & Sons Inc., First Edition, 2012.

REFERENCE BOOKS:

1.   Paul Deital and Harvey Deital, **"Android How to Program,"** Detial associates publishers, First Edition, 2013.

2. Zigurd Mednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura, **"Programming Android Java Programming for the New Generation of Mobile Devices,"** O'Reilly Media, First Edition, 2011.

IV B.Tech. I Semester

14BT71202: MULTIMEDIA AND APPLICATIONS DEVELOPMENT

(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Object Oriented Programming" and "Computer Graphics"

COURSE DESCRIPTION: Introduction to Multimedia; Fundamental Concepts in Audio and Video; Action Script 2.0; Multimedia Data Compression; Multimedia Network Communications and Applications.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate fundamental knowledge on image, audio, video representations & standards and multimedia network communications.

2. Analyze ActionScript principles, functions and components for developing multimedia authoring applications.

3. Apply various lossy/lossless coding techniques on text and images for compression and decompression.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO MULTIMEDIA (10 periods)

Definition of Multimedia, Multimedia and Hypermedia, Multimedia Software Tools, Graphics and Image Data representations-Graphics and Image Data types, File Formats, Color models in Images, Color models in Video.

Definition of sound, Digitization, Nyquist theorem, Signal to Noise Ratio, Signal to Quantization-Noise Ratio, Types of Video Signals, Analog Video, Digital Video.

UNIT - II: ACTIONSCRIPT-I (09 periods)

ActionScript 2.0 Features, Data Types and Type Checking: Static Typing, Type Syntax, Compatible Types, Casting, ActionScript 2.0 Type checking, Classes-Defining classes, Constructor functions, Properties, Methods.

Inheritance: A Primer on inheritance, Subclasses as subtypes, Overriding Methods and Properties, Constructor functions in Subclasses, Polymorphism and Dynamic binding.

UNIT - III: ACTIONSCRIPT-II (09 periods)

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.

Authoring an ActionScript 2.0 class, An OOP Application Development, Using Components with ActionScript 2.0, MovieClip Subclasses.

UNIT - IV: MULTIMEDIA DATA COMPRESSION (10 periods)

Lossless compression algorithms- Introduction, Basics of Information Theory, Run Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding. Lossy Compression Algorithms- Quantization,

Introduction to Transform Coding-DCT,DFT.

Image Compression Techniques: JPEG Standard, JPEG 2000.Audio Compression Techniques-ADPCM in Speech Coding Introduction to Video Compression, Video Compression Based on Motion Compensation, MPEG-1, MPEG-2.

UNIT - V: MULTIMEDIA NETWORK COMMUNICATIONS AND APPLICATIONS   (07 periods)

Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MoD).

Total Periods: 45

TEXT BOOKS:

1. Ze-Nian Li and Mark S. Drew, **"Fundamentals of Multimedia,"** Pearson Education, Second Edition, 2008.

2. Colin Moock, **"Essentials ActionScript 2.0,"** SPD O'Reilly, First Edition, 2005.

REFERENCE BOOKS:

1. Nigel Chapman and Jenny Chapman, **"Digital Multimedia,"** Wiley Dreamtech, Second Edition, 2004.

2. Brian Underdahl, **"Macromedia Flash MX,"** TMH, First Edition, 2002.

3. Fred Halsall, **"Multimedia Communications,"** Pearson, First Edition, 2004.

4. K.R.Rao, Zoram S. Bojkovic, **"Multimedia Communication Systems,"** Pearson Education, First Edition, 2002.

IV B.Tech. I Semester

14BT70501: COMPILER DESIGN

(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Theory of Computation ".

COURSE DESCRIPTION: concepts of Lexical analysis, Parsers, Run Time Environments, Type checking, Code Optimization, Code Generation and Compiler tools.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Gain knowledge on phases involved in design of compilers.
2. Acquire skills in code optimization.
3. Apply the knowledge on LEX and YACC tools to develop scanner and parser.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO COMPILER AND LEXICAL ANALYSIS

(09 periods)

Introduction to Compiler:
Structure of a compiler.

Lexical Analysis:
The Role of the Lexical Analyzer, Input Buffering, Specification of Tokens, The Lexical-Analyzer Generator Lex.

UNIT - II: SYNTAX ANALYSIS **(09 periods)**

Introduction: The Role of the Parser, Eliminating Ambiguity, Eliminating of Left Recursion and Left Factoring.

Top-Down Parsing: Recursive descent parsing, Non Recursive Predictive parsing, LL (1) Grammars.

Bottom-Up Parsing: Shift reduce parsing, LR parsers - Simple LR parser, Canonical LR parser, LALR parser, Using Ambiguous Grammars, The Parser Generator Yacc.

UNIT - III: SYNTAX DIRECTED TRANSLATION AND TYPE CHECKING

(09 periods)

Syntax-Directed Translation: Syntax directed definition, S-attributed and L-attributed definitions, Construction of syntax trees.

Type Checking: Type Expressions, Type Equivalence, Rules for Type Checking, Type Conversions, Overloading of Functions and Operators.

UNIT- IV: INTEMEDIATE CODE GENERATOR AND RUN TIME ENVIRONMENTS **(09 periods)**

Intermediate Code Generation: Variants of Syntax Trees, Three Address Code, Boolean expressions, Flow-of-Control Statements, Control-Flow Translation of Boolean Expressions.

Run time Environments: Storage organization, Stack Allocation of Space, Access to Nonlocal Data on the Stack.

UNIT - V: CODE OPTIMIZATION AND CODE GENERATION

(09 periods)

Code Optimization: Basic Blocks and Flow Graphs, Optimization of Basic Blocks, The principal sources of optimization, Introduction to data flow analysis.

Code Generation: Issues in the Design of a Code Generator, The Target Language, A Simple Code Generator, Peephole optimization, Register allocation and assignment.

Total Periods: 45

TEXT BOOK:

1. Alfred V. Aho, Monica S.Lam, Ravi Sethi, Jeffrey D. Ullman, **"Compilers-Principles, Techniques and Tools,"** Second Edition, Pearson Education, 2012.

REFERENCE BOOKS:

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

2. K.L.P Mishra and N. Chandrashekaran, **"Theory of computer science- Automata Languages and computation,"** Second Edition, PHI, 2003.

IV B.Tech. I Semester
14BT41501: COMPUTER GRAPHICS

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Engineering Mathematics", "Problem Solving and Computer Programming ".

COURSE DESCRIPTION: Introduction to Computer Graphics; Output Primitives; 2-D Geometric Transformations and Viewing; 3-D Geometric Transformations and Viewing; 3-D object representation; and Visible Surface Detection Methods.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Gain knowledge on graphical interactive devices, viewing transformations, 3-D object representations, surface detection methods.
2. Design algorithms to generate points, lines, polygons for 2-D, 3-D objects.
3. Apply Transformations and Clipping algorithms for 2-D and 3-D objects.

Detailed Syllabus:

UNIT - I: INTRODUCTION AND OUTPUT PRIMITIVES (10 periods)

Raster-scan systems, Random scan systems, Graphics monitors and work stations and input devices.

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 - II: 2-D GEOMETRICAL TRANSFORMS AND 2-D VIEWING
(10 periods)

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

2-D Viewing: The viewing pipeline, Viewing coordinate reference frame, Window to view-port coordinate transformation, Viewing functions, Cohen-Sutherland line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT - III: 3-D OBJECT REPRESENTATION   (08 periods)

Polygon surfaces, Quadric surfaces, Spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces.

UNIT - IV: 3-D GEOMETRIC TRANSFORMATIONS (08 periods)

Translation, Rotation, Scaling, Reflection and shear transformations, Composite transformations.

Viewing: Viewing pipeline, Viewing coordinates, Projections and clipping.

UNIT - V: VISIBLE SURFACE DETECTION METHODS (09 periods)

Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods, Shading: Gouraud Shading, Phong shading.

Total Periods:45

TEXT BOOK:

1. Donald Hearn and M. Pauline Baker, **"Computer Graphics C version,"** Pearson Education, 2006.

REFERENCE BOOKS:

1. Steven Harrington, **"Computer Graphics,"** TMH, 1982.

2. Neuman and Sproul, **"Principles of Interactive Computer Graphics,"** TMH, 2005.

IV B.Tech. I Semester

14BT71203: SCRIPTING LANGUAGES

(Professional Elective-I)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Object Oriented Programming through Java" and "Unix Internals".

COURSE DESCRIPTION: Scripts and scripting; perl; core python, Files and input/output and modules.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on: Scripting, Perl, Python.
2. Design and develop software systems using perl and python scripting languages.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO SCRIPTS AND SCRIPTING (08 periods)

Scripts and programs, Origins of Scripting, Scripting today, Characteristics of Scripting languages, Uses for scripting languages, Web scripting, The universe of scripting languages;

Introducing Perl: Perl phenomenon, Names and values in Perl, Variables and assignment, Scalar expressions, Control structures, Built-in functions, Collections of data, Working with arrays and lists, Working with hashes, Simple input and output, Strings, Patterns and regular expressions, Subroutines, Scripts with arguments, Operators and precedence.

UNIT - II: ADVANCED PERL (09 periods)

Finer points of looping, Finer points of subroutines, Using pack and unpack, Working with files, Navigating the file system, Typeglobs, eval, References, Data structure, Packages, Libraries and modules, Objects, Objects and modules in action, Tied variables, Interfacing to the operating system, Creating Internet-aware applications, Dirty hands internet programming, Security issues.

Introduction to Python: History and Features, Python Basics, Comments, Operators, Variables and Assignment. Lists and Tuples.

UNIT - III: CORE PYTHON (10 periods)

Syntax and style, Statements and Syntax, Variable Assignment, Identifiers Basic Style Guidelines, Memory Management, First Python Application; Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Unsupported Types; Numbers, Integers, Floating Point Real Numbers, Complex Numbers.

UNIT - IV: CONTROL STRUCTURES AND FILES (09 periods)

Conditionals and Loops, if statement, else Statement, elif (a.k.a. else-if) Statement, while Statement, for Statement, break Statement, continue Statement, pass Statement.

File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage, Modules; Errors and Exceptions,

Exceptions in Python, Detecting and Handling Exceptions, Raising Exceptions, Assertions Standard Exceptions;

UNIT-V: FUNCTIONS AND MODULES   **(09 periods)**

Functions and Functional Programming, Calling Functions, Creating Functions, Passing Functions, Formal Arguments, Positional Arguments, Default Arguments, Variable-length Arguments, Variable Scope.

Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules; Execution Environment, Callable Objects, Code Objects, Executable Object Statements and Built-in Functions, Executing Other (Python) Programs, Executing Other (Non-Python) Programs, Restricted Execution, Terminating Execution, Extending Python.

Total periods: 45

TEXT BOOKS:

1. David W. Barron, **"The World of Scripting Languages,"** WILEY India, First Edition, 2010.

2. Wesley J. Chun, **"Core Python Programming,"** Pearson publications, Second Edition, 2007.

REFERENCE BOOKS:

1. Martin C. Brown, **"Perl: The Complete Reference,"** McGraw Hill Education (India) Private Limited, Second Edition, 2001.

2. Mark Lutz, **"Programming Python,"** Shroff Publishers, First Edition, 2011.

IV B.Tech. I Semester

14BT71204: SOFTWARE TESTING TECHNIQUES

(Professional Elective-I)

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Software Engineering".

COURSE DESCRIPTION: Basic & Advance concepts of Software Testing and Techniques; STLC in SDLC; Coverage; Verification & Validation Models; Workbenches; Defects management; White box testing; Black box testing; Integration testing; System testing; Automation tools.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate in-depth knowledge in software testing methodologies, test strategies.
2. Analyzing testing circumstances and their resultants in software development.
3. Design & develop the best tests strategies in accordance to the development model.
4. Acquire problem solving skills to ensure quality software development meeting the industry standards.
5. Conduct tests with latest testing tools to address critical and complex areas of the software testing and achieve quality with ease.

Detailed Syllabus:

UNIT-I: BASIC CONCEPTS OF SOFTWARE TESTING

(09 periods)

Software Testing Fundamentals: Definition, Approaches, Testing during SDLC, Traceability Matrix, Essentials of Software Testing, Workbench, Features of Test Process, Misconceptions about Testing, Principles of Software Testing, Salient features of Good Testing, Test Policy, Test Strategy, Test Planning, Challenges in Testing, Categories of Defect, Defect, Error/ Mistake in Software, Test Process, Skills required by Tester.

UNIT-II: ADVANCED CONCEPTS OF SOFTWARE TESTING

(09 periods)

Software Verification & Validation: Verification, Verification Workbench, Methods of Verification, Types of Reviews, Reviews in STLC, Coverage in Verification, Concerns of Verification, Validation, Validation Workbench, Levels of Validation, Coverage in Validation, Management of Verification & Validation.

V-Test Model: V-model for Software, Testing during - Proposal Stage, Requirement Stage, Test-Planning Stage, Design Phase, Coding. VV Model, Critical Roles and Responsibilities.

Defect Management: Defect Classification, Management Process, Lifecycle, Template, Fixing & Root Cause of Defect, Estimating impact of

Defect, Defect Management needing the Risk, Techniques for finding Defects, Reporting a Defect.

UNIT-III: TESTING TECHNIQUES -I   (09 periods)

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

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

UNIT - IV: TESTING TECHNIQUES -II   (10 periods)

Logic Based Testing: Motivational Overview, Decision Tables, Path Expressions Again, KV Charts, Specifications.

State Graphs and Transition Testing: State Graphs, Good State Graphs and Bad, State Testing, Testability Tips.

UNIT - V: TESTING TOOLS AND TEST PLANNING   (08 periods)

Testing Tools: Features of Test Tool, Guidelines for selecting Test Tools, Tools and Skills of Tester, Static and Dynamic Testing Tools, Advantages and Disadvantages of using Test Tools, When to use Automated Test Tools, Testing using Automated Tools, Difficulties while introducing new Tools.

Test Planning: Test Policy and its contents, Strategy and its contents, Test Plan, Quality Plan and Test Plan, Quality Plan Template, System Test Plan Template, Guidelines for developing a Test Plan, Test Estimation, Test Standards, Test Scenarios and Test cases, Template for Test cases, Test Scripts, Building Test Data, Generation of Test Data, Roles and Responsibilities in STLC.

Total Periods: 45

TEXT BOOKS:
1. M.G.Limaye, **"Software Testing: Principles and Techniques and Tools,"** Tata Mc Graw - Hill Education, First Edition, 2009.
2. Boris Beizer, **"Software Testing Techniques,"** Dream Tech Press, Second Edition, 2004.

REFERENCE BOOKS:
1. Ilene Burnstein,**"Practical Software Testing,"** Springers-Verilog International Edition, 2003.
2. Dr.K.V.K.K.Prasad, **"Software Testing Tools,"** Dreamtech, First Edition, 2004.

IV B.Tech. I Semester

14BT70431: IMAGE PROCESSING AND PATTERN RECOGNITION

(Professional Elective-I)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	**70**	**100**	**3 1 - 3**

PREREQUISITES: Nil.

COURSE DESCRIPTION: Fundamentals of digital image processing; Image transforms; Image enhancement techniques in spatial and frequency domains; Restoration techniques; image segmentation techniques and Pattern recognition.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
   - Image Fundamentals
   - Image Enhancement and Restoration Techniques
   - Image Segmentation Techniques
   - Representation and description
   - Pattern recognition
2. Analyze the characteristics of images using image processing techniques.
3. Develop image processing algorithms to process the images for Real Time Applications.
4. Solve problems related to images for feasible and optimal solutions in the core area of Image Processing.

Detailed Syllabus:

UNIT - I: DIGITAL IMAGE FUNDAMENTALS   (10 periods)

Fundamental steps in digital Image Processing, Image sampling and quantization, some basic relationships between pixels, Arithmetic operations, Logical operations, Spatial operations.

Image Transforms: 2D-DFT and properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar-Transform, Slant Transform, Hotelling Transform.

UNIT - II: IMAGE ENHANCEMENT   (08 periods)

Basic Intensity transformation functions, Histogram processing, Fundamentals of Spatial Filtering, Smoothing spatial filters, Sharpening spatial filters, Basics of filtering in frequency domain, Image smoothing using frequency domain filters, Image sharpening using frequency domain filters, Homomorphic filtering.

UNIT-III: IMAGE RESTORATION AND SEGMENTATION (10 periods)

Image Degradation/Restoration model, Estimating the degradation function, Inverse filtering, Weiner filtering, Constrained least squares filtering. Detection of discontinuities- Point, line and edge Detection. Thresholding-

global thresholding, adaptive thresholding. Region based Segmentation.

UNIT - IV: REPRESENTATION AND DESCRIPTION   (09 periods)

Chain codes, polygonal approximation, signatures, boundary segments, skeletons, boundary descriptors, regional descriptors, principal components for description, relational descriptors.

UNIT - V: PATTERN RECOGNITION   (08 periods)

Pattern and pattern classes, recognition based on decision Theoretic methods- matching, optimum stastical classifiers, neural networks. Structural methods- matching shape numbers, string matching, syntactic recognition of strings, syntactic recognition of trees.

Total Periods: 45

TEXT BOOKS:

1. Rafael C. Gonzalez & Richard. E. Woods, **"Digital Image Processing,"** Third Edition, Pearson Education,2008.

2. Anil. K. Jain, **"Fundamentals of Digital Image Processing,"** Prentice Hall, 2007.

REFERENCE BOOKS:

1. William K. Pratt, **"Digital Image Processing,"** Third Edition, John Wiley and Sons, INC.2001.

IV B.Tech. I Semester

14BT71502: NETWORK PROGRAMMING

(Professional Elective-I)
(Common to CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Computer Networks".

COURSE DESCRIPTION: Introduction to network programming; sockets; TCP Client Server; I/O multiplexing and socket option; elementary UDP sockets; DNS; IPC; Remote Login.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in concepts of sockets, inter process communication and remote login.
2. Analyze networking protocols such as TCP and UDP.
3. Apply programming skills to solve problems relevant to client server architectures.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO NETWORK PROGRAMMING AND SOCKETS (10 periods)

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.

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 - II: TCP CLIENT SERVER AND SOCKET OPTIONS (10 periods)

TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

I/O Models, select function, Batch input, shutdown function, poll function, getsockopt and setsockopt functions, Socket states, Generic socket option IPV6 socket options.

UNIT - III: ELEMENTARY UDP SOCKETS AND DOMAIN NAME SERVERS (06 periods)

Introduction to UDP echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT - IV: INTERPROCESS COMMUNICATION (11 periods)

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 - V: REMOTE LOGIN **(08 periods)**

Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin overview, RPC, Transparency issues.

Total Periods: 45

TEXT BOOKS:

1. W.Richard Stevens, **"UNIX Network Programming,"** Vol. I, Sockets API, Third Edition, PHI, 2010

2. W.Richard Stevens, **"UNIX Network Programming IPC,"** Vol. II, Second Edition, PHI,2009

REFERENCE BOOKS:

1. T CHAN, **"UNIX SYSTEMS PROGRAMMING USING C++,"** Third Edition, PHI.

2. GRAHAM GLASS, KING ABLES, **"UNIX for programmers and Users,"** Third Edition, Pearson Education.

IV B.Tech. I Semester

14BT71506: SOFT COMPUTING

(Professional Elective-I)

(Common to CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Discrete Mathematical Structures".

COURSE DESCRIPTION: Concepts of Neural Networks (NN); Architecture of Back Propagation Networks; Adaptive Resonance Theory(ART); Fuzzy Vs Crisp Logic; Genetic Algorithms(GA);Genetic Modeling; Hybrid Systems.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Acquire knowledge on principles and techniques of soft computing such as Neural Networks, Associative Memory, Fuzzy-Logic, Genetic Algorithms and Hybrid Systems.
2. Analyze applications of back propagation networks and associative memory.
3. Solve Problems using fuzzy systems and genetic modeling.

Detailed Syllabus:

UNIT - I: NEURAL NETWORKS　　　　　　　　(09 periods)

Basic concepts of neural networks, Model of an artificial neurons, Neural Network architectures, Characteristics of neural network architecture, Early neural network architecture.

Backpropagation Networks: Architecture of Back Propagation Networks (BPN), Back propagation learning, Illustration, Applications. Effect of tuning parameters of backpropagation neural networks, Selection of various parameters in BPN, Variations of standard back propagation algorithm.

UNIT - II: ASSOCIATIVE MEMORY　　　　　　(09 periods)

Auto correlators, Hetero correlators, Multiple training encoding strategy, Exponential BAM, Associative memory for real coded pattern pairs, Applications.

Adaptive Resonance Theory (ART): Introduction, ART1, ART2, Applications.

UNIT - III: FUZZY SYSTEMS　　　　　　　　(09 periods)

Fuzzy versus Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations. Crisp Logic, Predicate Logic, Fuzzy Logic, Fuzzy rule based system, Defuzzification methods, Applications.

UNIT - IV: GENETIC ALGORITHMS (GA)　　　　(09 periods)

Basic concepts, Creation of Off-springs, Working principle, Encoding, Fitness Function, Reproduction.

Genetic Modelling: Inheritance operators, Cross Over, Inversion and Deletion, Mutation, Bitwise operators, Bitwise Operators Used in GA. Generational cycle, Convergence of Genetic Algorithm, Applications.

UNIT - V: INTEGRATION OF NEURAL NETWORKS, FUZZY LOGIC, AND GENETALGORITHMS **(09 periods)**

Hybrid Systems: Sequential hybrid systems, Auxiliary hybrid systems, Embedded hybrid systems, Neural networks, Fuzzy logic and Genetic Algorithms hybrids: Neuro-Fuzzy hybrids, Neuro-Genetic hybrids, Fuzzy-Genetic hybrids, Preview of the Hybrid systems: GA based Backpropagation Network, Fuzzy-Backpropagation network, Fuzzy Associative Memories, Fuzzy logic controlled GA.

Total Periods: 45

TEXT BOOK:

1. Rajasekaran S, G. A Vijayalakshmi Pai, **"Neural Networks, Fuzzy Logic, and Genetic Algorithms: Synthesis and Applications,"** PHI, 2009.

REFERENCE BOOKS:

1. Timothy J.Ross **"Fuzzy Logic with Engineering Applications,"** Wiley India Pvt. Ltd.-New Delhi, 2011.

2. Jang **"Neuro Fuzzy and Soft computing,"** Pearson First Edition,2007.

3. David E. Goldber g, **"G enetic Algorithms in s earc h, Optimization and Machine Learning,"** Pearson, First Edition, 2002.

IV B.Tech. I Semester
14BT71205: MACHINE LEARNING
(Professional Elective-II)
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Probability and Statistics", "Engineering Mathematics" and "Design and Analysis of Algorithms".

COURSE DESCRIPTION: Basic concepts of machine learning and decision trees; neural networks and genetic algorithms; Bayesian techniques; instant based learning and analytical learning and reinforced learning.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on supervised, unsupervised, reinforcement machine learning techniques and applications of machine learning.

2. Analyze skills on machine learning algorithms and its application.

Detailed Syllabus:

UNIT - I: INTRODUCTION, CONCEPT LEARNING AND DECISION TREES   (09 periods)

Learning Problems, Designing Learning systems, Perspectives and Issues, Concept Learning, Version Spaces and Candidate Elimination Algorithm, Inductive bias, Decision Tree learning, Representation, Algorithm, Heuristic Space Search.

UNIT - II: NEURAL NETWORKS AND GENETIC ALGORITHMS

(09 periods)

Neural Network Representation, Problems, Perceptrons, Multilayer Networks and Back Propagation Algorithms, Advanced Topics, Genetic Algorithms, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning.

UNIT - III: BAYESIAN AND COMPUTATIONAL LEARNING

(09 periods)

Bayes Theorem, Concept Learning, Maximum Likelihood, Minimum Description Length Principle, Bayes Optimal Classifier, Gibbs Algorithm, Naive Bayes Classifier, Bayesian Belief Network, EM(Expectation-Maximization) Algorithm, Probably Learning, Sample Complexity for Finite and Infinite Hypothesis Spaces, Mistake Bound Model.

UNIT - IV: INSTANT BASED LEARNING AND LEARNING SET OF RULES
(09 periods)

k- Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Sequential Covering Algorithms, Learning Rule Sets, Learning First Order Rules, Learning Sets of First Order Rules, Induction as Inverted Deduction, Inverting Resolution.

UNIT - V: ANALYTICAL LEARNING AND REINFORCED LEARNING
(09 periods)

Perfect Domain Theories, Explanation Based Learning, Inductive-Analytical Approaches, FOC L (Fir st Order C ombine d Lear ner) Algor ithm, Reinforcement Learning, Task, Q-Learning, Temporal Difference Learning.

Total Periods: 45

TEXT BOOK:

1. Tom M. Mitchell, **"Machine Learning,"** McGraw-Hill, First Edition, 2013.

REFERENCE BOOKS:

1. Ethem Alpaydin, **"Introduction to Machine Learning,"** MIT Press, Second Edition, 2009.

2. Kevin P. Murphy, **"Machine Learning : A Probabilistic Perspective,"** MIT Press, 2012.

IV B.Tech. I Semester

14BT71206: SERVICE ORIENTED ARCHITECTURE

(Professional Elective-II)
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Software Engineering".

COURSE DESCRIPTION: Web Services; Principles of SOA; Service Layers; Simple Object Access Protocol (SOAP); Web Services Description Language (WSDL).

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on:
    *   Fundamentals of web services
    *   Principles, services and policies of service orientation.
    *   XML, WSDL related to SOA
2. Analyze complex business process critically in identifying appropriate service model logic.

Detailed Syllabus:

UNIT - I: SOA AND WEB SERVICES FUNDAMENTALS (10 periods)

Introducing SOA: Fundamental SOA, Common Characteristics of Contemporary SOA, Common pitfalls of adopting SOA.
The Evolution of SOA: An SOA Timeline, The continuing evolution of SOA, The roots of SOA.

Web Services and Primitive SOA: The Web Services framework, Services, Service descriptions, messaging.

UNIT - II: SOA AND WS-* EXTENSIONS   (08 periods)

WS-* and Contemporary SOA (Part I): Message Exchange Patterns, Service Activity, Coordination, Atomic transactions, Business Activities.

WS-* and Contemporary SOA (Part-II): Addressing, Reliable messaging, Correlation, Policies, Metadata exchange.

UNIT - III: PRINCIPLES, SERVICE LAYERS AND PLANNING

(10 periods)

Principles of Service-Orientation: Anatomy of SOA, Common principles of Service Orientation, Inter relationship of Service Orientation Principles, Service Orientation and Object Orientation.

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 - IV: BUILDING SOA AND SERVICE MODELING (08 periods)

Service Oriented Analysis: Benefits of a Business Centric SOA and Deriving Business Services.

Service Modeling: Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT - V: BUILDING SOA AND SERVICE DESIGN   (09 periods)

Service-Oriented Design: WSDL related XML Schema language basics, WSDL language basics, SOAP language basics, Service interface design tools.

Service Design: Service Design overview, Entity-centric business Service Design, Application Service Design, Task-centric business Service Design, Service Design guidelines.

Total Periods: 45

TEXT BOOK:

1. Thomas Erl, **"Service-Oriented Architecture - Concepts, Technology, and Design,"** Pearson, First Edition, 2011.

REFERENCE BOOKS:

1. Shankar Kambhampaty, **"Service Oriented Architecture for Enterprise and Cloud Applications,"** Wiley- India, Second Edition, 2010.

2.   Eric Newcomer, **"Understanding SOA with Web Services,"** Pearson Education, Second Edition, 2005.

IV B.Tech. I Semester
14BT80504: DISTRIBUTED SYSTEMS
(Professional Elective-II)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Operating Systems".

COURSE DESCRIPTION: Characterization of distributed systems; system models; inter-process communication; distributed objects and remote invocation; name services; peer-to-peer systems; transactions and concurrency control and distributed shared memory and CORBA case study.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Gain knowledge on concepts of distributed systems, system models, Inter-process communication, and RMI.
2. Apply the concepts of distributed systems to solve the real time problems.
3. Design and implement distributed application.

Detailed Syllabus:

UNIT - I: CHARACTERIZATION OF DISTRIBUTED SYSTEMS AND SYTEM MODELS (09 periods)

Characterization of Distributed Systems-Introduction, Examples of Distributed systems, Resource sharing and web, challenges.

System models-Introduction, Architectural and Fundamental models.

UNIT - II: INTERPROCESS COMMUNICATION & DISTRIBUTED OBJECTS (09 periods)

Inter Process Communication - Introduction, The API for the Internet Protocols, External data representation and marshalling, Client-server communication, Group communication.

Distributed Objects and Remote Invocation-Introduction, communication between distributed objects, Remote procedure call, events and notifications.

UNIT - III: DISTRIBUTED FILE SYSTEMS & PEER-TO-PEER SYSTEMS (10 periods)

Distributed File Systems - Introduction, File Server Architecture.
Name Services - Introduction, Name Services and the Domain Name System, Directory Services, Case Study of Global Name Service, Case Study of the X.500 Directory Service.
Peer-to-Peer Systems-Introduction, Napster and its Legacy, Peer-to-Peer Middleware, Routing Overlays.

UNIT - IV: TRANSACTIONS AND CONCURRENCY CONTROL & DISTRIBUTED TRANSACTIONS (09 periods)

Transactions and Concurrency control-Introduction, Transactions, Nested

Transactions, Locks, Optimistic Concurrency Control, Timestamp Ordering, Comparison of Methods for Concurrency Controls.

Distributed Transactions -Introduction, Flat and Nested Distributed Transactions, Atomic Commit Protocols, Concurrency control in Distributed Transactions, Distributed Deadlocks, and Transaction Recovery.

UNIT - V: DISTRIBUTED SHARED MEMORY & CORBA CASE STUDY

(08 periods)

Distributed Shared Memory - Design and Implementation Issues, Sequential Consistency and Ivy Case Study, Release Consistency and Munin Case Study, Other Consistency Models.
CORBA Case Study- CORBA RMI, CORBA Services

Total Periods: 45

TEXT BOOK:

1. G. Coulouris, J. Dollimore, and T. Kindberg **"Distributed Systems: Concepts and Design,"** Pearson Education, Fourth Edition, 2013.

REFERENCE BOOKS:

1. Andrew S. Tanenbaum and Maarten Van Steen, **"Distributed Systems: Principles and Paradigms,"** Second Edition, Pearson, 2007.

2. M. L. Liu **" Distributed Comp uting, Princ ip les and Applications",** Pearson Education, Third Edition, 2013.

IV B.Tech. I Semester
14BT80505: NETWORK MANAGEMENT
(Professional Elective-II)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Computer Networks" and "Network Security"

COURSE DESCRIPTION: Principles of Network Management; SNMPv1; SNMPv2; SNMPv3; Network management and Communication; Remote Monitoring and Telecommunication management Network; Broadband and Advanced Management.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate Knowledge on SNMP, Telecommunications Networks and Remote monitoring.
2. Analyze Traffic Management Problems in Network through Remote Monitoring.
3. Apply Advanced Management tools in web based Enterprise Management.

Detailed Syllabus:

UNIT - I: DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW   (09 periods)

Data Communications Foundations: Analogy of Telephone Network Management, Communication Protocols and standards, Networks, Systems, and Services, case histories of Network, System, and Service Management, Challenges of IT Managers.

Netw ork Management Overview : Networ k Management Goals, Organization and functions, Network Management Architecture and Organization, Current Status and Future of Network Management.

UNIT - II: BASIC FOUNDATIONS & SNMPV1 ORGANIZATION AND INFORMATION MODELS   (09 periods)

Basic Foundations: Network Management Standards, Network Management Models, Organizational Model, Information Model, Communication Model, Functional Model, ASN.1, Encoding Structure

SNMPV1: History of SNMP Management, internet organization and standard, SNMPV1 Architecture, Organization and Information models.

UNIT - III: SNMPV1 COMMUNICATION AND FUNCTIONAL MODELS AND SNMPV2 NETWORK MANAGEMENT   (09 periods)

SNMPV1: SNMP Architecture, Administrative Model, SNMP Protocol Specifications, SNMP Operations, SNMP MIB Group, Functional Model

SNMPV2: Major changes in SNMPV2, System Architecture, SNMPV2 structure of Management Information, SNMPV2 Management Information Base, SNMPV2 protocol, Compatibility with SNMPV1.

UNIT - IV: SNMPV3 NETWORK MANAGEMENT AND RMON

(09 periods)

SNMPV3: Key features, SNMPV3 architecture, applications, Management Information Base, User based security model, Access control

Remote Monitoring: Introduction to Remote monitoring, RMON Structure of Management Information and Management Information Base, RMON1, RMON2, ATM Remote monitoring and Case study.

UNIT - V: TELECOMMUNICATIONS MANAGEMENT NETWORK AND ADVANCED MANAGEMENT   **(09 periods)**

Tele Communications Management Network: Introduction to TMN, Operations Systems, TMN conceptual model, TMN Architecture, TMN integrated view.

Advanced Management: Next Generation NM Requirements, Limitations of SNMP Management, Evolutionary Approaches, Web Interface and Web Management, Web-based Enterprise Management, Web-based interface Management Architecture, XML based NM Technology.

Total periods: 45

TEXT BOOK:

1. Mani Subramanian, **"Network Management: Principles and practice,"** Second Edition, New Delhi: Pearson Education, 2012.

REFERENCE BOOKS:

1. William Stallings, **"SNMP, SNMPV2,SNMPV3 and RMON 1 and 2,"** Third Edition, New Delhi: Pearson Education, 2009.

2. Stephen B Morris, **"Network Management, MIBS and MPLS: Principles, Design and Implementation,"** New Delhi: Pearson Education 2008.

IV B.Tech. I Semester
14BT81503: HUMAN COMPUTER INTERACTION
(Professional Elective-II)
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	**70**	**100**	**3 1 - 3**

PREREQUISITES: Nil.

COURSE DESCRIPTION: Importance of user interface; Graphical user interface; Design process; Screen Designing; Windows; Components; Software Tools and Interaction Devices.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Acquire knowledge on principles and components of HCI.
2. Analyze product usability evaluations and testing methods.

Detailed Syllabus:

UNIT - I: INTRODUCTION   (09 periods)

Importance of User Interface - definition, Importance of good design, Benefits of good design, A brief history of Screen design, The graphical user interface - popularity of graphics, The concept of direct manipulation, Graphical system, Characteristics, Web user - Interface popularity, characteristics- Principles of user interface.

UNIT - II: DESIGN PROCESS   (08 periods)

Design process - Human interaction with computers, Importance of human characteristics, human consideration in design, Human interaction speeds, and understanding business functions.

UNIT - III: SCREEN DESIGN   (10 periods)

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 - IV: WINDOWS AND MULTIMEDIA   (08 periods)

Windows - New and Navigation schemes selection of window, selection of devices based and screen based controls; Components - text and messages, Icons and increases - Multimedia, colors, uses problems, choosing colors.

UNIT - V: SOFTWARE TOOLS AND DEVICES   (10 periods)

Software tools - Specification methods, interface - Building Tools - Interaction Devices - Keyboard and function keys pointing devices - speech recognition digitization and generation - image and video displays - drivers.

Total periods: 45

TEXT BOOKS:

1. Wilbert O Galitz, **"The Essential Guide to User Interface Design,"** Second Edition, Wiley India Education.

2. Ben Schneiderman, **"Designing the User Interface,"** Fourth Edition, Pearson Education, Asia.

REFERENCE BOOKS:

1. A Dix, Janet Finlay, G D Abowd and R Beale, **"Human-Computer Interaction,"** Third Edition, Pearson Publishers, 2008.

2. Jonathan Wolpaw and Elizabeth Winter Wolpaw, **"Brain-Computer Interfaces,"** Principles and Practice, First Edition, Oxford Publishers, 2012.

IV B.Tech. I Semester

14BT71221: MOBILE APPLICATIONS DEVELOPMENT LAB

Int. Marks	Ext. Marks	Total Marks	L T P C
25	50	75	- - 3 2

PREREQUISITES: A Course on "Mobile Application Development"

COURSE DESCRIPTION: Hands-on experience on development of Android Mobile applications with Submenus; Context menus; Layouts; Buttons; Date Picker; Scroll view and database access with Android SQLite.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Design and develop android applications to solve real world problems.
2. Demonstrate problem solving skills for developing android mobile applications.
3. Use modern tools Eclipse IDE with android ADT, and Android Studio to develop android mobile applications.

List of Experiments:

1. Test the android development environment by performing the following operations.
   a. Add the sample application to a project in eclipse workspace.
   b. Create an Android Virtual Device (AVD) for sample project.
   c. Create a launch configuration for sample project.
   d. Run sample application in Android Emulator.
2. Develop a program to build an Android Application to display a message on the screen.
3. Develop a program which will implement Sub menu in android application.
4. Develop a program to implement Context menu (Floating List of Menu Items) in android application.
5. Develop a program to demonstrate the use of Relative Layout Views with different attributes.
6. Develop a program to demonstrate the use of Linear Layout Views with different attributes.
7. Develop a program to implement a Custom Button and handle the displayed message on button press.
8. Develop a program to implement the Table layout in View Group that displays child View elements in rows and columns.
9. Develop a program to implement the List View in android application.
10. Develop a program to show how to use Date picker control of ADK in android applications.
11. Develop a program that can show the creation of a scrollview when text is not visible on one page.
12. Develop a program to insert, delete, display, and update the

employee details using Android SQLite.

REFERENCE BOOKS:

1. Wei-Meng Lee, John, **"Beginning Android™ 4 Application Development,"** Wiley & Sons Inc., First Edition, 2012.

2. Jeff McWherter, Scott Gowell, **"Professional Mobile Application Development,"** Wiley & Sons Inc., First Edition, 2012.

3.   Paul Deital and Harvey Deital, **"Android How to Program,"** Detial associates publishers, First Edition, 2013.

4. Zigurd Mednieks, Laird Dornin, G. Blake Meike, Masumi Nakamura, **"Programming Android: Java Programming for the New Generation of Mobile Devices,"** O'Reilly Media, First Edition, 2011.

IV B.Tech. I Semester

14BT71222: MULTIMEDIA AND APPLICATIONS DEVELOPMENT LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
25	50	75	-	-	3	2

PREREQUISITES: Courses on "Object Oriented Programming' and 'Computer Graphics"

COURSE DESCRIPTION: Hands on experience in Animating Flash Movies and Developing ActionScript Applications using a Flash Tool.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Design and develop various user authoring applications, multimedia games and animation movies using flash tool.

2. Apply various ActionScript programming principles to animate interactive flash movies for presenting multimedia content more efficiently.

List of Experiments:

The following Experiments to be Developed using adobe Flash Tool:

1. Draw an object and apply the following animation techniques:

   a. Motion Tween   b. Rotation   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. a. Animate a Flash movie that shows rolling wheel as a movie clip symbol.

   b. 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 the User Registration form.

TEXT BOOK:

1. Colin Moock, **"Essentials ActionScript 2.0,"** SPD O'Reilly, First Edition,2005.

IV B.Tech. I Semester

14BT71223: SEMINAR

Int. Marks	Ext. Marks	Total Marks	L T P C
-	50	50	- - - 2

PREREQUISITES: Nil.

COURSE DESCRIPTION: Identification of seminar topic; Literature survey; Preparation of technical report and Presentation.

COURSE OUTCOMES:

After the successful completion of the Seminar, the student will be able to:

1. Acquire in-depth knowledge in core and allied areas of interest.
2. Analyze and synthesize information related to the areas.
3. Conceptualize and construct research problems.
4. Extract information pertinent to a specific area through literature survey to conduct research.
5. Identify the applicability of modern software and tools.
6. Contribute positively to multidisciplinary groups in emerging areas with objectivity and rational analysis.
7. Plan, organize, prepare and present effective written and oral technical reports.
8. Develop independent and reflective learning.
9. Acquire awareness on professional code of conduct in the chosen area.
10. Develop independent and reflective learning.

IV B.Tech. II Semester

14BT81201: CLOUD COMPUTING

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Computer Networks" and "Operating Systems"

COURSE DESCRIPTION: Cloud computing fundamentals; cloud computing architecture; cloud computing mechanisms; cloud security; working with clouds, virtualization and case studies.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on services, architecture, types of infrastructural models, Disaster Recovery and Virtualization.

2. Analyze the issues in cloud computing.

Detailed Syllabus:

UNIT - I: FUNDAMENTALCLOUD COMPUTING   (09 periods)

Understanding Cloud Computing: Origins and Influences, Basic Concepts and Terminology, Goals and Benefits, Risks and Challenges.

Fundamental Concepts and Models: Roles and Boundaries, Cloud Characteristics, Cloud Delivery Models, Cloud Deployment Models.

UNIT - II: CLOUD COMPUTING MECHANISMS AND ARCHITECTURE

(09 periods)

Cloud-Enabling Technology: Broadband Networks and Internet Architecture, Data Center Technology, Virtualization Technology, Web Technology, Multitenant Technology, Service Technology.

Fundamental Cloud Arc hitectures: Architecture - Workload Distribution, Resource Pooling, Dynamic Scalability, Elastic Resource Capacity, Service Load Balancing, Cloud Bursting, Elastic Disk Provisioning, Redundant Storage.

UNIT - III: CLOUD COMPUTING ADVANCED ARCHITECTURES

(10 periods)

Advanced Cloud Architectures: Architecture-Hypervisor Clustering, Load Balanced Virtual Server Instances, Non-Disruptive Service Relocation, Zero Downtime, Cloud Balancing, Resource Reservation, Dynamic Failure Detection and Recovery, Bare-Metal Provisioning, Rapid provisioning,

storage Workload Management.

Specialized Cloud Architectures: Architecture - Direct I/O Access,Direct LUN Access,Dynamic Data Normalization,Elastic Network Capacity,Cross-Storage Device Vertical Tiering,Intra-Storage Device Vertical Data Tier ing, Load Balance d Virtual Sw itches,Multipath R esource Access,Persistent Virtual Network Configuration,Redundant Physical Connection for Virtual Servers,Storage Maintenance Window.

UNIT - IV: WORKING WITH CLOUDS **(09 periods)**

Cloud Delivery Model Considerations: Cloud Delivery Models - The Cloud Provider, Cloud Delivery Models - The Cloud Consumer, Case Study Example.

Cost Metrics and Pricing Models: Business Cost Metrics, Cloud Usage Cost Metrics, Cost Management Considerations.

UNIT - V: INTRODUCTION TO VIRTUALIZATION **(08 periods)**

History of Virtualization, Objectives of virtualization, Benefits of Virtualized Technology, VMware, Microsoft Hyper-V and Ubuntu.

Total Periods: 45

TEXT BOOKS:

1. Thomas Erl and RicardoPuttini **"Cloud Computing- Concepts, Technology and Architecture,"** Pearson, First Edition 2013.

2. Ivanka Menken, **"Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book,"** First Edition, 2009.

REFERENCE BOOKS:

1. Barrie Sosinsky, **"Cloud Computing Bible,"** Wiley India Pvt Ltd, First Edition, 2011.

2. Rajkumar Buyya, James Broberg and Andrzej Goscinski, **"Cloud computing principles and paradigms,"** John Wiley and Sons, 2011.

3. John W. Rittinghouse, James F. Ransome, **"Cloud Computing implementation, Management and Security,"** CRC Press, Taylor & Francis group, First Edition 2010.

IV B.Tech. II Semester

14BT81202: CRYPTOGRAPHY AND NETWORK SECURITY

(Common to CSE, ECE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Computer Networks".

COURSE DESCRIPTION: Principles and practice of cryptography and network security: classical systems, symmetric block ciphers-DES; public-key cryptography-RSA, Diffie-Hellman; hash functions, authentication, key management, key exchange, signature schemes, E-mail, web security, and firewalls.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge on Cryptographic algorithms, their mathematical models, Message Authentication, Digital Signatures and firewall.
2. Analyze vulnerabilities and threats on information systems based on various security parameters.

Detailed Syllabus:

UNIT - I: CLASSICAL ENCRYPTION TECHNIQUES   (08 periods)

Introduction: Services, Mechanisms, and Attacks Concepts, The OSI Security Architecture, Model for Network Security.

Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques.

UNIT - II: BLOCK CIPHERS AND PUBLIC-KEY CRYPTOGRAPHY

(09 periods)

Block Ciphers and the Data Encryption Standard: Block Cipher Principles, The Data Encryption Standard (DES), The Strength of DES, Block Cipher Design Principles, Block Cipher Modes of Operation.

Public-Key Cryptography: Principles of Public-Key Cryptosystems, the RSA Algorithm, Diffie-Hellman Key Exchange.

UNIT - III: MESSAGE AUTHENTICATION CODES, HASH FUNCTIONS, AND DIGITAL SIGNATURES   (09 periods)

Message authentication codes: Message Authentication Requirements, Message Authentication Functions, Message Authentication Codes, Hash Functions, Security of Hash Functions and MACs, Hash algorithms-SHA, HMAC.

Digital Signatures: Digital Signatures, Digital Signature Standard (DSS), Authentication applications- Kerberos, X.509 Authentication Service**.**

UNIT - IV: ELECTRONIC MAIL SECURITY, IP SECURITY AND WEB SECURITY   (10 periods)

Electronic Mail Security: Pretty Good Privacy (PGP), S/MIME-Multipurpose Internet Mail Extensions (MIME), S/MIME Functionality, Messages, Certificate

Processing.

IP Security: IP Security Overview, Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations.

Web Security: Web security Considerations, Secure Sockets Layer (SSL), Transport Layer Security (TLS), Secure Electronic Transaction.

UNIT - V: INTRUDERS, MALICIOUS SOFTWARE, AND FIREWALLS
(09 periods)

Intruders: Intrusion Detection, Password Management-Password Protection, Password selection.

Malicious Software: Viruses and Related Threats, Virus Countermeasures.

Firewalls: Firewall Design Principles, Trusted Systems.

Total Periods: 45

TEXT BOOK:

1. William Stallings, **"Cryptography and Network Security Principles and Practice,"** Pearson Education, Third Edition, 2003.

REFERENCE BOOKS:

1. William Stallings, **"Network Security Essentials Applications and Standards,"** Pearson Education, Third Edition.

2. Behrouz A For ouzan and De bdee d Mukhopadhy ay, **"Cryptography and Network Security,"** McGraw Hill Education, Second Edition, 2010.

IV B.Tech. II Semester

14BT81203: **.NET TECHNOLOGIES**

(Professional Elective-III)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Object Oriented Programming".

COURSE DESCRIPTION: Knowledge on .NET Framework and C# Programming; Object-oriented concepts with C#; Exception handling mechanism; Interfaces; Generics; Delegates and Events in C#; Database access with ADO.NET; Web application development using Web forms and Web controls.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
- Basics of .NET platform.
- Building C# applications, designing ASP.NET websites, performing Data access, building ASP.NET applications.
2. Design and develop Graphical User Interface and Web applications using .NET technologies.
3. Demonstrate problem solving skills for creating C# applications, ASP.NET applications and websites.

Detailed Syllabus:

UNIT - I: INTRODUCING C# AND .NET PLATFORM   (09 periods)

Benefits of the .NET platform, Building blocks of the .NET platform, Overview of .NET assemblies, C ommon type sy stem, Common language specification, Common language runtime, Platform-independent nature of .NET.

The role of the .NET framework 4.5 SDK, Building .NET application using visual studio, Anatomy of a simple C# program, System. Console class, System data types and corresponding C# keywords. Working with string data, C# iteration constructs, Decision constructs and the Relational/equality operators.

UNIT - II: CORE C# PROGRAMMING & OOP WITH C# AND EXCEPTION HANDLING   (08 periods)

Understanding C# arrays, Introducing the C# class type, Constructors, The role of the this keyword, The static keyword, Pillars of OOP, C# access modifiers, C# encapsulation services, Understanding automatic properties, The basic mechanics of inheritance , The Details of Inheritance, C#'s

polymorphic support.

The role of .NET Exception Handling, The simplest possible example, System-level exceptions, Application level exceptions, Processing multiple exceptions.

UNIT - III: INTERFACES, GENERICS, DELEGATES AND EVENTS

(10 periods)

Understanding interface types, Defining custom interfaces, Implementing an Interface, Implementing an interfaces using visual studio, Role of generic type parameters , Creating custom generic methods, Creating custom generic structures and classes, Understanding the .NET delegate type, Delegate example, Generic Delegate, and C# Events , Understanding operator overloading.

UNIT - IV: ADO.NET   (09 periods)

High level definition of ADO.NET, ADO.NET data provider, ADO.NET namespaces, Connected layer of ADO.NET, Data Readers , Database transactions, Disconnected layer of ADO.NET, Role of the dataset, Working with DataColumns, Data Rows, DataTable, DataAdapters, Binding DataTable objects to windows forms GUIs.

UNIT - V: ASP.NET WEB FORMS AND WEB CONTROLS, STATE MANAGEMENT TECHNIQUES   (09 periods)

The role of http, Web applications and web servers, Role of client side scripting, Posting back to the web server, Overview of ASP.NET API, Building a single file ASP.NET web page, building an ASP.NET webpage using Code Files, ASP.NET web sites vs. ASP.NET Web applications, ASP.NET web site directory structure, The life cycle of an ASP.NET web page, Role of the web.config file, Understanding the nature of web controls, Major categories of ASP.NET web control , The Role of validation controls, Application Cache, The Control and WebControl Base Classes, Maintaining session data, Cookies.

Total Periods: 45

TEXT BOOK:

1. Andrew Troelsen **"Pro C# 5.0 and the .NET 4.5 Framework,"** Apress, Sixth Edition, 2012.

REFERENCE BOOKS:

1. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, **"Professional C# 4 and .NET 4,"** WROX Publications, First Edition, 2010.

2.   Mathew Mac Donald, **"The Complete Reference ASP.NET,"** TATA McGraw Hill, First Edition, 2010.

IV B.Tech. II Semester

14BT70503: ADVANCED COMPUTER ARCHITECTURE

(Professional Elective-III)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Computer Organization".

COURSE DESCRIPTION: Quantitative design and analysis, memory hierarchy design; parallel computer models and network properties; pipelining, superscalar techniques, multiprocessors and multi computers; Multi-Vector, SIMD and Multi-Core computers.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
- Computational models and Computer Architectures.
- Concepts of parallel computer models.
- Scalable Architectures.
- Pipelining, Superscalar processors, multiprocessors, SIMD and Multi core Computers.
2. Analyze the architectures of parallel computers and their interconnection structures.
3. Design modern computer architectures and hardware systems.

Detailed Syllabus:

UNIT - I: FUNDAMENTALS OF QUANTITATIVE DESIGN AND ANALYSIS, MEMORY HIERARCHY DESIGN   (09 periods)

Fundamentals of Quantitative Design and Analysis: Introduction, Classes of computers, Defining Computer Architecture, Trends in technology, Trends in power and energy in ICs, Trends in cost, Dependability, Quantitative Principles of Computer Design.

Memory Hierarchy Design: Introduction, Advanced optimizations of cache performance, Memory technology and optimizations, Cross cutting issues-The design of memory hierarchies.

UNIT-II: PARALLEL COMPU TER MODELS AND NETWORKS PROPERTIES   (09 periods)

Parallel Computer Models: The state of computing, Multiprocessors and multi-computers, Multi vector and SIMD computers,

Program and Networks Properties: Conditions of Parallelism, Program partitioning and scheduling, Program flow mechanisms, System interconnect architectures.

Examples: Detection of Parallelism in a program using Bernstein's conditions.

UNIT - III: PRINCIPLES OF SCALABLE PERFORMANCE AND MEMORY

(09 periods)

Principles of Scalable Performance: Performance metrics and

measures, Parallel Processing applications, Speedup performance laws.

Bus, Cache and Shared memory: Bus systems, Cache memory organizations, Shared memory organizations.

UNIT - IV : PIPELINING AND SUPERSCALAR TECHNIQUES, MULTIPROCESSORS AND MULTICOMPUTERS (09 periods)

Pipelining and Superscalar Techniques: Linear pipeline processors, nonlinear pipeline processors, Instruction pipeline design, Arithmetic pipeline design.

Multiprocessors and Multi-computers: Multiprocessor system interconnects Cache Coherence and synchronization mechanisms.

UNIT - V: MULTIVECTOR AND SIMD COMPUTERS, MULTICORE COMPUTERS (09 periods)

Multi-Vector and SIMD computers: Vector processing principles, Multi-vector multiprocessors, SIMD computer organizations- Implementation Models, CM2 Architecture; The Connection Machine CM5: As synchronized MIMD Machine, The CM5 Network architecture, Control Processor and processing nodes, Inter processor communications.

Case Studies: CRAY line of Computer Systems, Power PC architecture.

Total Periods: 45

TEXT BOOKS:

1. Kai Hwang and Naresh Jotwani, **"Advanced Computer Architecture,"** Second Edition, New Delhi, McGraw Hill, 2011.

2. John L. Hennessy and David A. Patte rson, **"Computer Architecture-A Quantitative Approach,"** Fifth Edition, Elsevier, 2012.

REFERENCE BOOKS:

1. Kai Hwang **"Advanced Computer Architecture,"** First Edition, New Delhi, Tata McGraw Hill, 2001.

2. Anantha Grama, Anshul Gupta, George Karypis and Vipin Kumar, **"Introduction to Parallel Computing,"** Second Edition, New Delhi, Pearson Education, 2003.

IV B.Tech. II Semester

14BT80532: AD-HOC AND WIRELESS SENSOR NETWORKS

(Professional Elective-III)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Computer Networks".

COURSE DESCRIPTION: Ad Hoc Wireless Networks, Wireless Sensor Networks, issues of MAC protocols, Routing Protocols, Transport Layer Protocols, Quality of Service and Energy Management.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge in:
   - Ad hoc and sensor networks
   - MAC Protocols and Routing Protocols
   - TCP over ad hoc wireless networks
   - QoS in ad hoc wireless networks.
2. Analyze the issues in MAC, Routing and Transport Layer in ad hoc wireless networks.
3. Apply routing and energy management techniques in the field of ad hoc wireless networks.

Detailed Syllabus:

UNIT - I: AD-HOC WIRELESS NETWORKS AND MAC PROTOCOLS

(09 periods)

Ad-hoc Wireless Networks: Introduction to Ad-hoc Wireless Networks, Issues in AdHoc wireless Networks, Ad-hoc Wireless Internet.

MAC Protocols for Ad-hoc Wireless Networks: Introduction, Design Issues, Design Goals, Classification of MAC Protocols, Contention-Based Protocols-MACAW (A Media Access Protocol for Wireless LANs), Busy Tone Multiple Access Protocols, Distributed Packet Reservation Multiple Access Protocol, Distributed Priority Scheduling and Medium Access in Ad-hoc Networks.

UNIT - II: ROUTING PROTOCOLS FOR AD-HOC WIRELESS NETWORKS

(11 periods)

Routing in Ad-hoc Wireless Networks: Introduction, Design Issues, Classification of Routing Protocols, Table Driven Routing Protocols-DSDV, On-Demand Routing Protocols-DSR, AODV, Hybrid Routing Protocols-ZRP, Hierarchical Routing Protocols-Hierarchical State Routing Protocol, Power-Aware Routing Protocols.

Multicast Routing In Ad-hoc Wireless Networks: Introduction, Design Issues, Operation, Classification of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols-Bandwidth-Efficient Multicast Routing Protocol, Multicast Routing Protocol Based on Zone Routing, Mesh-Based Multicast Routing Protocols-On Demand Multicast Routing Protocol.

UNIT - III: TRANSPORT LAYER PROTOCOLS FOR AD-HOC WIRELESS

NETWORKS (07 periods)

Introduction, Design Issues, Design Goals of a Transport Layer Protocol for Ad-hoc Wireless Networks, TCP Over Ad-hoc Wireless Networks-Traditional TCP, Feedback-Based TCP, TCP with Explicit Link Failure Notification.

UNIT - IV: QUALITY OF SERVICE AND ENERGY MANAGEMENT IN AD-HOC WIRELESS NETWORKS (09 periods)

Quality of Service in Ad Hoc Wireless Networks: Introduction, Issues and Challenges in Providing QoS in Ad-hoc Wireless Networks, Classification of QoS Solutions.

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, Transmission Power Management Schemes, System Power Management Schemes.

UNIT - V:WIRELESS SENSOR NETWORKS (09 periods)

Wireless Sensor Networks: Introduction, Sensor Network Architecture, Data Dissemination, Data Gathering, MAC Protocols for Sensor Networks-Self-Organizing MAC for Sensor Networks and Eavesdrop and Register, Quality of a Sensor Network.

Total Periods: 45

TEXT BOOK:

1. C.Siva Ram Murthy, B.S.Manoj, **"Adhoc Wireless Networks - Architectures and Protocols,"** Pearson Education, 2011.

REFERENCE BOOKS:

1. C.K.Toh, **"Ad-hoc Mobile Wireless Networks: Protocols and Systems,"** First Edition, New Delhi, Pearson Education, 2007.

2. Charles E.Perkins, **"Ad hoc Networking,"** First Edition, New Delhi, Pearson Education, 2008.

IV B.Tech. II Semester

14BT71501: EMBEDDED SYSTEM PROGRAMMING

(Professional Elective-III)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Computer Organization"and "Operating Systems".

COURSE DESCRIPTION: Embedded Systems, Design process; 8051 - Microcontroller; Program Modeling; Real Time Operating systems principles; Embedded system development tools.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in the following:
   - Embedded system components.
   - 8051 Microcontroller.
   - Principles of Real Time Operating Systems.
   - Embedded System design and development Process.
2. Demonstrate programming skills to develop software for embedded systems development.

Detailed Syllabus:

UNIT - I: INTRODUCTION   (09 periods)

Embedded Systems, Processor Embedded into a system, Hardware units and devices in a system, software, Examples, SoC and VLSI technology, Complex System design and processors, System Design process, Design Formalization, Examples, Classification, Designer skills.

UNIT - II: MICROCONTROLLER   (10 periods)

8051 Micro controller Hardware, Input/output Ports and Circuits, Assembly language programming-PC, ROM space, data types, flags and register banks. Jump, loop and call instructions, Addressing modes, I/O ports, Arithmetic and logic instructions and programs, programming in C.

UNIT - III: PROCESSES AND REAL-TIME OPERATING SYSTEMS

                                              (09 periods)

Threads and Tasks: Tasks, Task States, Task and Data, Concept of Semaphores, Shared Data, Inter-process Communication, Signal Function, Semaphore Functions, Message Queue Functions, Mailbox Functions, Pipe Functions.

Real-Time Operating Systems: OS Services, Process Management, Timer Functions, Event Functions, Memory Management, Device, File and I/O subsystems management, Interrupt routines.

UNIT - IV: EMBEDDED PROGRAMMING   (09 periods)

Program Modeling Concepts and Embedded Programming: Program Models, DFG Models, State Machine Programming Models for Event-controlled

Program Flow, Modeling of Multiprocessor Systems, UML Modeling. Software Programming in Assembly Language (ALP) and in High-Level Language 'C', 'C' & Program Elements, Object-Oriented Programming, Embedded Programming in C++ & Java.

UNIT - V: EMBEDDED SYSTEM DEVELOPMENT **(08 periods)**

Embedded Software Development Process and Testing: 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 on Host Machine, Simulators and Laboratory Tools.

Total Periods: 45

TEXT BOOKS:

1. Rajkamal, **"Embedded Systems Architecture, Programming and Design,"** Tata McGraw Hill, Second Edition, 2008.

2. Mazidi and Mazidi, **"The 8051 Microcontroller and Embedded Systems,"** Pearson, Second Edition, 2014.

REFERENCE BOOKS:

1. Kenneth J.Ayala, **"The 8051 Microcontroller,"** Cengage India, Third Edition, 2009.

2. David E. Simon, **"An Embedded Software Primer,"** Pearson Education, First Indian Reprint 2000.

IV B.Tech. II Semester

14BT81501: HIGH PERFORMANCE COMPUTING

(Professional Elective-III)
(Common to CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PRE REQUISITE: A Course on "Computer Organization".

COURSE DESCRIPTION: Cache-based microprocessor architecture; Memory hierarchies; Multithreaded processors; Common sense Optimizations; The role of compilers; Data access optimization; Shared-memory computers; Parallel scalability; Introduction to OpenMP; Parallel Jacobi algorithm; Introduction to MPI; MPI performance tools; MPI parallelization of Jacobi solver.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Gain Knowledge on Modern Processors and code Optimization.
2. Design Parallel Computing algorithms.
3. Acquire Skills in Parallel Programming using OpenMP and MPI tools.

Detailed Syllabus:

UNIT - I: MODERN PROCESSORS   (08 periods)

Stored-program computer architecture, General-purpose cache-based microprocessor architecture, Memory Hierarchies, Multicore processors, Multi-threaded processors, Vector Processors.

UNIT -II: BASIC OPTIMIZATION TECHNIQUES FOR SERIAL CODE
                                                    (10 periods)

Scalar profiling, Common sense optimizations , Simple measures, large impact, The role of compilers, C++ Optimizations, Data access optimization-Balance analysis and lightspeed estimates, Storage order.

Case study: The Jacobi algorithm and Dense matrix transpose.

UNIT - III: PARALLEL COMPUTERS   (09 periods)

Taxonomy of parallel computing paradigms, Shared-memory computers, Distributed-memory computers, Hierarchical systems, Networks. Basics of parallelization, Data Parallelism, Function Parallelism, Parallel Scalability.

UNIT - IV: SHARED-MEMORY PARALLEL PROGRAMMING WITH OpenMP   (09 periods)

Introduction to OpenMP - Parallel execution, Data scoping, OpenMP work sharing for loops, Synchronization, Reductions, Loop scheduling and Tasking.

Case study: OpenMP-parallel Jacobi algorithm

Efficient OpenMP programming-Profiling OpenMP programs, Performance pitfalls.

Case study: Parallel sparse matrix-vector multiply.

UNIT - V: DISTRIBUTED-MEMORY PARALLEL PROGRAMMING WITH MPI   **(09 periods)**

Message passing, Introduction to MPI, Examples: MPI parallelization of Jacobi solver.

Efficient MPI Programming: MPI performance tools, communication parameters, Synchronization, serialization, Contention, Reducing communication overheads, Understanding intranode point-to-point communication.

Total Periods:45

TEXT BOOK:

1. Georg Hager and Gerhard Wellein, **"Introduction to High Performance Computing for Scientists and Engineers,"** Chapman & Hall / CRC computational Science series, First Edition, 2011.

REFERENCE BOOKS:

1. Charles Se ver ance, Kev in Dowd, **"High Perf ormance Computing,"** O'Reilly Media, Second Edition , 1998.

2. Kai Hwang, Faye Alaye Briggs, **"Computer Architecture and Parallel Processing,"** McGraw Hill, 1984.

IV B.Tech. II Semester
14BT81204: INFORMATION RETRIEVAL SYSTEMS
(Professional Elective-IV)

(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Courses on "Data Structures and Database Management Systems"

COURSE DESCRIPTION: Architecture of Information Retrieval Systems; Functional Capabilities; Data Structures; Mathematical Algorithms; Indexing; Similarity and Clustering; Human Perception and Presentation; Text Search Techniques and Evaluation Measures.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on Information Retrieval Systems including architecture, functional capabilities, indexing and data presentation methods.
2. Analyze clustering algorithms to group similar data items and text search techniques for efficient search.
3. Design and develop data structures used to store/retrieve data items, mathematical algorithms and measures to evaluate retrieval systems.

Detailed Syllabus:

UNIT - I: INTRODUCTION (11 periods)

Primary Information Retrieval Problems, Objectives of Information Retrieval System, Functional Overview, Understanding the Search Functions, Relationship to DBMS, Digital libraries and Data Warehouses, Data structures and Mathematical Algorithms.

UNIT - II: INGEST AND INDEXING (09 periods)

Introduction, Item Receipt, Duplicate Detection, Item Normalization, Zoning and Creation of Processing Tokens, Stemming, Entity Processing, Categorization, Citational Metadata, Manual Indexing Process, Automatic Indexing of Text and Multimedia.

UNIT - III: SEARCH AND CLUSTERING (09 periods)

Similarity measures and Ranking, Hidden Markov Models Techniques, Ranking Algorithms, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches for Boolean Systems, Multimedia Searching, Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.

UNIT - IV: INFORMATION PRESENTATION (08 periods)

Introduction, Presentation of the Hits, Display of the Item, Collaborative Filtering, Multimedia Presentation, Human Perception and Presentation.

UNIT - V: SEARCH ARCHITECTURE AND EVALUATION

(08 periods)

Index Search Optimization, Text Search Optimization, GOOGLE Scalable multiprocessor architecture, Information System Evaluation, Measures used in system evaluation

Total Periods: 45

TEXT BOOK:

1. Gerald Kowalski, **"Information Retrieval Architecture and Algorithms,"** Springer, First Edition, 2013.

REFERENCE BOOKS:

1. Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, **"An Introduction to Information Retrieval,"** Cambridge University Press, First Edition, 2012.

2. Ricardo Baeza-Yates and Berthier Ribiero-Neto, **"Modern Information Retrieval the concepts and technology behind search,"** Addison Wesley, Second Edition, 2010.

IV B.Tech. II Semester

14BT81205: MOBILE COMMUNICATIONS

(Professional Elective-IV)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: Course on "Computer Networks" and "Data communications".

COURSE DESCRIPTION: Introduction to Mobile Computing; Medium Access Control; Wireless LAN; Mobile Network and Transport Layers; Data Dissemination; Mobile Ad-Hoc Networks (MANETS); Wireless Application Protocol (WAP).

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge in:
   - GSM, GPRS, Wireless LAN, MANET.
   - Protocols in Network, Transport and Application layer.
2. Analyze the issues related to database design in mobile applications.
3. Apply routing algorithms for finding shortest path in MANETS.

Detailed Syllabus:

UNIT - I: OVERVIEW OF MOBILE COMMUNICATIONS AND GSM
(09 periods)

Introduction: History, applications, simplified reference model.

GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT - II: MEDIUM ACCESS CONTROL AND WIRELESS LAN
(09 periods)

Motivation for a specialized MAC - Hidden and exposed terminals, Near and far terminals, SDMA, FDMA, TDMA, CDMA.

IEEE 802.11: System architecture, Protocol architecture, Physical layer, Medium access control layer, MAC management,

Bluetooth: User scenarios, Architecture, Radio layer, Baseband layer, Link manager protocol, L2CAP, Security.

UNIT - III: MOBILE NETWORK AND TRANSPORT LAYERS
(09 periods)

Mobile IP: Goals, assumptions, entities and terminology, IP packet delivery, agent 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; TCP over 2.5/3G wireless networks.

UNIT - IV: DATABASE ISSUES AND DATA DISSEMINATION

(09 periods)

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.

Data Dissemination: Push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT - V: MOBILE AD HOC NETWORKS (MANETS) AND WAP

(09 periods)

Mobile Ad-hoc Networks: Routing, Destination sequence distance vector, Dynamic source routing, Alternative metrics, Overview ad-hoc routing protocols.

Wireless Application Protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment.

Total Periods: 45

TEXT BOOKS:

1. Jochen Schiller, **"Mobile Communications",** Pearson Education, Second Edition, 2003.

2. Rajkamal, **"Mobile Computing,"** OXFORD University Press, Second Edition, 2008.

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,"** Springer, Second Edition, 2003.

IV B.Tech. II Semester
14BT81206: SEMANTIC WEB
(Professional Elective-IV)
(Common to CSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A Course on "Web Programming"

COURSE DESCRIPTION: Semantic web fundamentals; Semantic web technology; Ontology web language; Swoogle; Semantic web services.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:

1. Demonstrate knowledge on:
    *   Semantic web search
    *   RDF , SWOOGLE
    *   Semantic web services
    *   RDFS, OWL
2. Acquire analysis skills on semantic web search engines and ontology engineering.

Detailed Syllabus:

UNIT - I: INTRODUCTION (09 periods)

The world of the semantic web: WWW, Internet usage, Meta data-Search engine, Search engine for traditional web-Semantic web.

UNIT - II: SEMANTIC WEB TECHNOLOGY (09 periods)

RDF(Resource Description Framework), Rules of RDF, Aggregation-Distributed information, core elements of RDF, Ontology and Taxonomy, Inferencing based on RDF schema, RDF tools

UNIT- III: ONTOLOGY WEB LANGUAGE -OWL (08 periods)

OWL (Ontology Web Language), Using OWL to define classes, Set operators and Enumerations, Define properties ontology matching, Three faces of OWL, Validate OWL, Protege editor.

UNIT - IV: SWOOGLE (10 periods)

Swoogle Architecture, FOAF, Semantic markup, Issues, prototype system, Design of Semantic web search engine, Discovery and indexation strategy, Need for Semantic WebServices.

UNIT - V: SEMANTIC WEB SERVICES (09 periods)

Semantic web services and applications, OWL-S: Upper ontology, WSDL-S, OWL-S to UDDI mapping Design of the search engine, implementations.

Total Periods: 45

TEXT BOOK:

1. Liyang Yu, **"Introduction to the Semantic Web and Semantic**

Web Services," Chapman & Hall/CRC, Taylor & Francis group, 2007.

REFERENCE BOOKS:

1. Johan Hjelm, **"Creating the Semantic Web with RDF,"** Wiley, 2001.

2. Grigoris Antoniou and Frank van Harmelen, **"A Semantic Web Primer",** MIT Press, 2004.

IV B.Tech. II Semester
14BT80502: **BIG DATA**
(Professional Elective-IV)
(Common to CSE, CSSE and IT)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITEs: Courses on "Data Base Management Systems" and "Data Warehousing and Data Mining".

COURSE DESCRIPTION: Introduction to Big Data, Types of Data Sources, Hadoop Frameworks and HDFS, Map Reduce, Hadoop Ecosystem Components.

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Demonstrate knowledge in:
   - Analytic Paradigms
   - Big data Characteristics
   - Hadoop Framework.
2. Analyze the need for database systems for storing the large data.
3. Design and model an effective and sustainable database for better performance using Big data tools.

Detailed Syllabus:

UNIT - I: INTRODUCTION TO BIG DATA   (09 periods)

Big Data Characteristics: Volume-Variety-Velocity-Veracity, Analytics, Basic Nomenclatur e, Analytics Process Model, Analytical Model Requirements, Types of Data Sources, Sampling, Types of Data Elements, Missing Values, Standardizing Data, Outlier Detection and Treatment, Categorization.

UNIT - II: HADOOP FRAMEWORKS AND HDFS   (08 periods)

Frameworks: A Brief History of Hadoop, The Hadoop Ecosystem, Hadoop Releases, The Building Blocks of Hadoop: Name Node-Data Node-Secondary Name Node-Job Tracker-Task Tracker.

The Hadoop Distributed File system: The Design of HDFS, HDFS Concepts, Hadoop File Systems .

UNIT - III: MAP REDUCE   (09 periods)

Map Reduce: Anatomy of a Map Reduce: Map Reduce1, Map Reduce2 **Failures:** Failures in Classic MapReduce, Failures in YARN.

Job Scheduling: The Fair Scheduler, the Capacity Scheduler. Shuffle and Sort, Input Formats, Output Formats.

UNIT - IV: HIVE AND PIG   (10 periods)

Hive: The Hive Shell, Hive Services, Comparison with Traditional Databases, HiveQL, Tables, Querying Data, User-Defined Functions.

Pig: Installing and Running Pig, Comparison with Databases, Pig Latin,

User-Defined Functions, Data Processing Operators.

UNIT - V: CASE STUDY (09 periods)

Case Study: Hadoop Usage at Last.fm, Hadoop and Hive at Facebook, Nutch Search Engine, Log Processing at Rackspace, Mahout,Sqoop.

Total Periods: 45

TEXT BOOKS:

1. Bart Baesens, **"Analytics in a Big Data World: The Essential Guide to Data Science and its Applications,"** Wiley Publications ,2014.

2. Tom White, **"Hadoop:The Definitive Guide,"** Third Edition, O'REILLY Publications, 2012.

REFERENCE BOOKS:

1. Paul Zikopoulos, IBM, C hr is Eaton, Paul Zik opoulos **"Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data,"** The McGraw-Hill Companies, 2012.

2. Chuck Lam **"Hadoop in action,"** Manning Publications, 2011.

IV B.Tech. II Semester

14BT71507: SOFTWARE PROJECT MANAGEMENT

(Professional Elective-IV)

Int. Marks	Ext. Marks	Total Marks	L T P C
30	70	100	3 1 - 3

PREREQUISITES: A course on "Software Engineering".

COURSE DESCRIPTION: Conventional Software Management ;Evolution of Software Economics; Improving Software Economics; Lifecycle Phases; Artifacts of the Process; Workflow of the Process; Checkpoints of the Process; Software Economics; Iterative Process Planning; Project Organization and Responsibilities; Process Automation ; Project Control and Project Instrumentation; Case study(CCPDS-R).

COURSE OUTCOMES:

After the successful completion of the course, the student will be able to:
1. Gain knowledge on software effort estimation techniques, life cycle phases, project control and instrumentation.
2. Analyze the major and minor milestones, artifacts and metrics from management and technical perspective.
3. Design and develop software product using conventional and modern principles of software project management.
4. Adopt team effectiveness through Work Breakdown Structures by optimal cost and schedule estimates.

Detailed Syllabus:

UNIT - I: SOFTWARE MANAGEMENT RENAISSANCE   (08 periods)

Conventional software management:

The waterfall model, conventional software Management performance.
Evolution of software economics: Software Economics, pragmatic software cost estimation.

Improving Software Economics:

Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT - II: LIFE CYCLE PHASES   (09 periods)

Conventional and Modern Software Management:

Principles of Modern software engineering, principles of modern software management, transitioning to an iterative process.

Life Cycle Phases:

Engineering and Production Stages, Inception, Elaboration, construction, transition phases.

UNIT - III: ARTIFACTS OF THE PROCESS, WORKFLOWS OF THE PROCESS   (09 periods)

Artifacts of the Process:

The Artifact Sets, Management Artifacts, Engineering Artifacts, Pragmatic Artifacts.

Model Based Software Architectures:

Architecture- Management Perspective, Technical Perspective.
Workflows of the Process:

Software Process Workflows, Iteration Workflows.

U NIT - IV : CHECKPOINTS OF THE PROCESS, PROJECT ORGANIZATIONS AND RESPONSIBILITIES, PROCESS AUTOMATION

(09 periods)

Checkpoints of a process: Major Milestones, Minor Milestones, Periodic Status Assessments.

Iterative Process Planning: Work Breakdown Structures, Planning Guidelines, the Cost and Schedule Estimating Process, Pragmatic Planning Project Organizations and Responsibilities: Line of Business Organizations, Project organizations, Evolution of Organizations

Process Automation: Tools- Automation Building blocks, The Project Environment.

UNIT - V: PROJECT CONTROL AND PROCESS INSTRUMENTATION, TAILORING THE PROCESS, CCPDS-R(CASE STUDY)

(10 periods)

Project control and process Instrumentation: The Seven Core Metrics, Management Indicators, Quality Indicators, Lifecycle Expectations, Pragmatic Software Metrics Automation

Tailoring the Process: Process Discriminants, Next generation cost models, Modern Software Economics

CCPDS-R Case Study: Context for Case Study, Common Subsystem Overview, Process Overview, Demonstration-Based Assessment, Core Metrics

Total Periods: 45

TEXT BOOK:
1. Walker Royce, **"Software Project Management,"** Pearson Education, 1998.

REFERENCE BOOKS:
1. Bob Hughes and Mik e Cotter ell, **" Software Projec t Management,"** Tata McGraw- Hill Edition, 2006.

2. Joel Henry, **"Software Project Management,"** Pearson Education, 2003.

IV B.Tech. II Semester
14BT81221: COMPREHENSIVE VIVA-VOCE

Int. Marks	Ext. Marks	Total Marks	L T P C
-	100	100	- - - 2

PREREQUISITES: Nil.

COURSE DESCRIPTION: Assessment of student learning outcomes.

COURSE OUTCOMES:

After the successful completion of the Comprehensive Viva-voce, the student will be able to:

1. Demonstrate knowledge in the program domain.

2. Exhibit professional etiquette suitable for career progression.

3. Present views cogently and precisely.

IV B.Tech. II Semester
14BT81222: PROJECT WORK

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
60	140	200	-	-	20	10

PREREQUISITES: Nil.

COURSE DESCRIPTION: Identification of topic for the project work; Literature survey; Collection of preliminary data; Identification of implementation tools and methodologies; Performing critical study and analysis of the topic identified; Time and cost analysis; Implementation of the project work; Preparation of thesis and presentation.

COURSE OUTCOMES:

After the successful completion of the Project Work, the student will be able to:

1. Demonstrate in-depth knowledge on the project topic.

2. Identify, analyze and formulate complex problem chosen for project work to attain substantiated conclusions.

3. Design solutions to the chosen project problem.

4. Undertake investigation of project problem to provide valid conclusions.

5. Use the appropriate techniques, resources and modern engineering tools necessary for project work.

6. Understand professional and ethical responsibilities while executing the project work.

7. Function effectively as individual and a member in the project team.

8. Develop communication skills, both oral and written for preparing and presenting project report.

9. Demonstrate knowledge and understanding of cost and time analysis required for carrying out the project.

10. Engage in lifelong learning to improve knowledge and competence in the chosen area of the project.