SREE VIDYANIKETHAN ENGINEERING COLLEGE

(AUTONOMOUS)

Sree Sainath Nagar, Tirupati

Department of Computer Science and Engineering

Supporting Document for 1.1.2

Syllabus Revision carried out in 2016

Program: M.Tech.- Computer Science

Regulations : SVEC-16

This document details the following:

1. Courses where syllabus has been changed 20% and more.
2. Course-wise revised syllabus with changes highlighted.

Note: *For SVEC-16 revised syllabus, SVEC-14 (previous syllabus) is the reference.*

List of Courses where syllabus has been changed (20% and more)

Course Code	Name of the course	Percentage of Syllabus changed	Page Number in which Details are Highlighted
16MT10502	Advanced Database Management Systems	32.7	1
16MT10505	Computer Vision	100	5
16MT10507	Internet of Things	100	7
16MT22504	Software Testing Techniques	100	9
16MT10531	Database Management Systems & Data Warehousing and Data Mining Lab	66.6	11
16MT10532	Data Structures & Computer Networks Lab	42.8	17
16MT20502	Big Data Analytics	100	23
16MT12501	Cloud Computing	52.7	27
16MT22505	Web Technologies	49	31
16MT20504	Embedded Systems	50.9	35
16MT20531	Cloud Computing and Big Data Analytics Lab	100	39
16MT20532	Object Oriented Analysis and Design Lab	33.3	41
16MT23810	Intellectual Property Rights	100	49
	Average	**71.38**	
	Total No. of Courses in the Program	28	
	No. of Courses where syllabus (more than 20%) has been changed	13	
	Percentage of Syllabus changed in the Program	**33.14**	

DEAN (Academics)

Dean (Academics)
Sree Vidyanikethan Engg. College
Sree Sainath Nagar
TIRUPATI - 517 102, A.P., India.

PRINCIPAL

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SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)
Sree Sainath Nagar, A. RANGAMPET
Chittoor (Dist.) - 517 102, A.P., INDIA.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech. I Semester
(16MT10502) Advanced Database Management Systems

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	*60*	*100*	*4*	--	--	*4*

PRE-REQUISITES: A Course on "Database Management System".

COURSE DESCRIPTION:

Concepts of Database System and Architectures, Data modeling using ER-Model; SQL, Objects Relational Database and XML; Database Design and File Organizations; Query Processing, Concurrency and Recovery; Distributed DBMS Architecture and Design.

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

CO1: Gain Advanced knowledge in

- Database System Concepts , Languages , Interfaces and Architectures
- Query Languages , Relational Databases and XML
- Database Design and File Organization.
- Query Processing and Recovery
- Distributed Database Architecture and Design

CO2: Analyze database management architecture and categorize languages and database objects.

CO3: Design a wide range of potential solutions for the database problems using ER-diagrams SQL, Normalization and XML.

CO4: Initiate Research to develop new Architectural models and Query processing using SQL in database Systems.

CO5: Apply appropriate modern techniques, resources and tools for the real world problems in databases.

DETAILED SYLLABUS:

UNIT I–Database System Concepts and Architectures, Data modeling using ER-Model (11 periods)

Database System Concepts and Architectures:

Architecture And Data Independence, Database Languages and Interfaces, Database System Environment, Centralized and Client/server Architectures for DBMS.

Data modeling using ER-Model:

Using High-Level Conceptual data Model for Database Design, A Sample Database Application, Entity Types, Entity Sets, Attributes, and Keys, Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types, Refining the ER Design for the COMPANY Database, ER Diagrams, Naming Conventions, and Design Issues, Relationship Types of Degree Higher than Two, Relational Database Design using ER-to-Relational Model.

UNIT II: SQL, Objects Relational Database and XML (12 Periods)

SQL: Schema Definition, Constraints, Queries, Joins, Assertions, Triggers and Views

Object Relational Databases: Concepts for Object Databases, Standards, Languages and Design.

XML: Hierarchical data model, Documents, DTD, XML Schema, Documents and Databases, Querying.

UNIT III: Database Design and File Organizations (11 Periods)

Database Design: Functional Dependencies, Types of Normal Forms, properties of relational decompositions, Algorithms for Relational Database Design.

File Organizations: Introduction, Secondary Storage Devices, Buffering of Blocks, Placing File Records on Disk, Operations on Files, Files of Unordered Records, Files of Ordered Records, Hashing Techniques, Other Primary File Organizations, Parallelizing Disk Access Using RAID Technology, New Storage Systems.

UNIT IV: Query Processing, Concurrency and Recovery (12 Periods)

Query Processing: Problem, Objectives, Characterization, Layers and Query Optimization and Query Optimization Algorithms: INGRES, System R, Distributed INGRES, R*, SDD-1 Algorithms

Concurrency Control: Transaction management types and properties, Algorithms, Deadlock Management.

Recovery: Concepts, Techniques Based on Deferred Update and Immediate Update, Shadow paging and ARIES Algorithm.

UNIT V: Distributed DBMS Architecture and Design (09 Periods)

Distributed DBMS Architecture: Architectural Models and Architectures

Distributed Database Design: Alternative Design Strategies, Distribution Design Issues, Fragmentation and Allocation

Total Periods: 55

TEXT BOOKS:

1. Ramez Elmasri & Shamkant B. Navathe, "*Database Systems: Models, Languages, Design and Application Programming,*" 6 ed., Pearson Education, New Delhi , 2013.
2. M. Tamer Ozsu, Patrick Valduriez, "*Principles of Distributed Database System,*" 2 ed., Pearson Education, New Delhi ,2006.

REFERENCE BOOKS:

1. Abraham Silberchatz, Henry F. Korth, S. Sudarsan, "Database System Concepts," 5 ed., McGraw-Hill, New York, 2006.
2. Thomas M. Connolly, Carolyn E. Begg, "Database Systems – A Practical Approach to Design, Implementation and Management," 3 ed., Pearson Education, New Delhi, 2003.

M.Tech (CS) I-Semester
(14MT10502) ADVANCED DATABASE MANAGEMENT SYSTEMS

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	--	--	4

PREREQUISITE: *A course on* "Database Management Systems"

COURSE DESCRIPTION:
Database Languages and architecture; Concepts of database design and modeling; SQL and Object relational databases; database design and file organizations; Query and transaction processing, concurrency; Distributed databases

COURSE OUTCOMES:
On successful completion of this course the students will be able to :

CO1. Gain knowledge about the
- Characteristics of Databases
- Architecture and applications of Databases

CO2. Analyse the need for database systems for storing the data.
CO3. Design and model an effective and sustainable database for better performance using database management system tools.
CO4. Apply concepts of normalization for designing complex databases for enhanced performance.

UNIT-I: DATABASE LANGUAGES AND ARCHITECTURE, RELATIONAL MODEL, CONCEPTUAL DATA MODELING (Periods:11)
Introduction to Databases – Overview of Database Languages and Architecture – The Basic Relational Model
Conceptual Data Modeling Using Entities and Relationships: Using High-Level Conceptual data Model for Database Design, A Sample Database Application, Entity Types, Entity Sets, Attributes, and Keys, Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types, Refining the ER Design for the COMPANY Database, ER Diagrams, Naming Conventions, and Design Issues, Relationship Types of Degree Higher than Two.

UNIT-II: SQL, OBJECT RELATIONAL DATABASE AND XML (Periods:11)
Mapping a Conceptual Design into a Logical Design: Relational Database Design using ER-to-Relational Mapping, SQL**:** Data Definition, Constraints, Basic Queries and Updates, Advanced Queries, Assertions, Triggers, and Views. **Object and Object-Relational Databases:** Concepts, Models, Languages and Standards, **XML:** Concepts, Languages, and Standards.

UNIT-III: DATABASE DESIGN AND FILE ORGANIZATIONS (Periods:11)
Database Design Theory: Introduction to Normalization Using Functional and Multivalued Dependencies, Normalization Algorithms.
Database File Organizations: Unordered, Ordered, and Hashed Files of Records: Introduction, Secondary Storage Devices, Buffering of Blocks, Placing File Records on Disk, Operations on Files, Files of Unordered Records,

Files of Ordered Records, Hashing Techniques, Other Primary File Organizations, Parallelizing Disk Access Using RAID Technology, New Storage Systems.

UNIT-IV: QUERY AND TRANSACTION PROCESSING, CONCURRENCY AND RECOVERY (Periods:11)

Introduction to Query Processing and Query Optimization Techniques, Introduction to Database Tuning and Physical Design Issues, Foundations of Database Transaction Processing, Introduction to Protocols for Concurrency Control in Databases, Introduction to Database Recovery Protocols

UNIT-V: DISTRIBUTED DATABASES (Periods:12)

Concepts, Types of Distributed Database Systems, Distributed Database Architectures, Data Fragmentation, Replication, and Allocation Techniques for Distributed Database Design, Query Processing and Optimization, Overview of Transaction Management, Overview of Concurrency Control and Recovery, Distributed catalogue management, Current Trends, Distributed Databases in Oracle Emerging Database Technologies and Applications.

Total Periods: 56

TEXTBOOKS:

1. Ramez Elmasri & Shamkant B. Navathe, *"Database Systems: Models, Languages, Design and Application Programming,"* Sixth Edition, New Delhi, Pearson Education, 2013.
2. M. Tamer Ozsu, Patrick Valduriez, *"Principles of Distributed Database System,"* Second Edition, New Delhi, Pearson Education, 2006.

REFERENCE BOOKS:

1. Thomas M. Connolly, Carolyn E. Begg, "Database Systems – A Practical Approach to Design, Implementation and Management," Third Edition, New Delhi, Pearson Education, 2003.
2. Stefano Ceri, Giuseppe Pelagatti, "Distributed Databases Principles and Systems," N.Y, McGraw-Hill International Editions, 1985.
3. Rajesh Narang, "Object Oriented Interfaces and Databases," New Delhi, Prentice Hall of India, 2002.
4. Abraham Silberchatz, Henry F. Korth, S. Sudarsan, "Database System Concepts," Fifth Edition, N.Y, McGraw-Hill, 2006.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Computer Science and Engineering

M. Tech (CS) – I Semester

(16MT10505) COMPUTER VISION

(Professional Elective-I)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	*60*	*100*	*4*	-	-	*4*

PRE-REQUISITES:

A Course on "Computer Graphics"

COURSE DESCRIPTION:

Concepts of Cameras, Measuring Light , Sources, Shadows and Shading; Linear filters, Edge detection; Segmentation by clustering, Segmentation by fitting a model; Finding templates using classifiers , Recognition by relations between Templates; Geometric camera models, Camera calibration.

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

CO -1: Gain knowledge in image processing techniques.

CO -2: Analyze the applicability of various techniques such as Fourier Transforms, Normalized Correlation, Estimating Derivatives in filtering and edge detection to generate quality images.

CO -3: Solve complex image segmentation problems using clustering and fitting models.

CO -4: Conduct Research on geometric methods and tools for camera calibration.

CO -5: Apply building classifiers, voting and search techniques and Image Processing tools for finding templates for real world images.

DETAILED SYLLABUS:

UNIT-I: CAMERAS, SOURCES, SHADOWS AND SHADING (10 Periods)

Cameras: Pinhole Cameras, Camera with Lenses, the Human Eye and Sensing. **Radiometry-Measuring Light:** Light in Space, Light at Surfaces and Important Special Cases.

Sources, Shadows and Shading: Qualitative Radiometry, Sources and their effects, Local Shading Models, Application: Photometric Stereo, Inter reflections: Global Shading Models.

UNIT-II: LINEAR FILTERS AND EDGE DETECTION (11 Periods)

Linear Filters: Linear Filters and Convolution, Shift Invariant Linear Systems, Spatial Frequency and Fourier Transforms, Sampling and Aliasing ,Filters as Templates, Techniques- Normalized Correlation and Finding Patterns, Scale and Image Pyramids.

Edge Detection: Noise, Estimating Derivatives, Detecting Edges, Texture: Representing Texture, Analysis using Oriented Pyramids.

Application: Synthesizing Textures for Rendering Shape for Texture for Planes.

UNIT-III: SEGMENTATION BY CLUSTERING AND FITTING A MODEL (11 Periods)

Segmentation by Clustering: Introduction to Segmentation, Human Vision: Grouping and Gestalt, Applications: Shot Boundary Detection and Background Subtraction, Image Segmentation by Clustering Pixels, Segmentation by Graph-Theoretic Clustering.

Segmentation by Fitting a Model: The Hough Transform, Fitting Lines, Fitting Curves, Fitting as Probabilistic Inference Problem, Robustness, Example: Using RANSAC to Fit Fundamental Matrices, Missing Data Problems, the EM Algorithm.

UNIT-IV:FINDING TEMPLATES USING CLASSIFIERS AND RECOGNITION BY RELATIONS BETWEEN TEMPLATES 13 Periods)

Finding Templates using Classifiers: Method for Building Classifiers, Building Classifiers from Class Histograms, Feature Selection, Neural Networks, the Support Vector Machine.

Recognition by relations between Templates: Finding Objects by Voting on Relations between Templates, Relational Reasoning Using Probabilistic Models and Search, Using Classifiers to Prune Search, Hidden Markov Models, Application: HMM and Sign Language Understanding, Finding People with HMM.

UNIT-V: GEOMETRIC CAMERA MODELS AND GEOMETRIC CAMERA CALIBRATION (10 Periods)

Geometric Camera Models: Elements of Analytical Euclidean Geometry, Camera Parameters and the Perspective Projection, Affine Cameras and Affine Projection Equations, **Geometric Camera Calibration:** Least-Squares Parameter Estimation, A Linear Approach to Camera Calibration, Taking Radial Distortion into Account, Analytical Photogrammetry, An Application: Mobile Robot Localization, **Introduction to image processing tools**: Adobe Photoshop, Macromedia Fireworks.

Total Periods: *55*

TEXT BOOK:

1. David A. Forsyth and Jean Ponce:"*Computer Vision – A Modern Approach*," PHI Learning, 2009.

REFERENCE BOOKS:

1. G Sommer, "*Geometric Computing with Clifford Algebra*, "1 ed., Springer ,Newyork,2001
2. Milan Sonka, Vaclav Hlavac, Roger Boyle "*Digital Image Processing and Computer Vision*," 1 ed., Ceneage Learning India Pvt. Ltd, New Delhi , 2008.
3. Jack," *Computer Vision and Applications*," Concise Edition, Academy Press, 2000.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech (CS) – I Semester
(16MT10507)INTERNET OF THINGS
(Common to CS and CNIS)
(Professional Elective – 1)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	*60*	*100*	*4*	-	--	*4*

PRE-REQUISITES:
Courses on "Computer Networks" and "Java"

COURSE DESCRIPTION:
Domain Specific IoT's; M2M& System Management with Netconf-Yang; Developing Internet of Things Using Python; IoT Physical Devices & Case Studies Illustrating IoT Design

COURSE OUTCOMES:
After successful completion of this course, students will be able to:
CO1: Gain knowledge on
- Building blocks of Internet of Things and characteristics.
- Application areas of IoT
- Concept of M2M (machine to machine) with necessary protocols

CO2: Analyze Domain specific IoT's, revolution of Internet in Mobile Devices.
CO3: Design and Develop Techniques for solutions to solve the problems in IoT using Python Scripting Language.
CO4: Conduct research on domain specific IoT's and IoT enabling Technologies.
CO5: Acquire knowledge to recognize the opportunities and contribute to collaborative-multidisciplinary Scientific Research.

DETAILED SYLLABUS:

UNIT I– INTRODUCTION & CONCEPTS (08 periods)
Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, Logical Design of IOT, IOT Enabling Technologies, IoT Levels and Templates

UNIT II – DOMAIN SPECIFIC IOTS (09 periods)
Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style

UNIT III – M2M & SYSTEM MANAGEMENT WITH NETCONF-YANG (11 *periods*)
IoT and M2M – M2M, Difference between IOT and M2M, difference between SDN and NFV for IoT, Software defined networks, network function virtualization, Need for IOT Systems Management, Simple Network Management Protocol, Limitations of SNMP, Network Operator Requirements.
Basics of IoT System Management with NETCOZF, YANG, YANG-NETCONF

UNIT IV – DEVELOPING INTERNET OF THINGSUSING PYTHON (15 periods)

Introduction, IOT Design Methodology, Installing Python, Language features of Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, File Handling, Date/ Time Operations, Classes, Exception handling, Python Packages of Interest for IoT.

UNIT V – IOT PHYSICAL DEVICES & ENDPOINTS (12 *periods*)

What is an IOT Device, Exemplary Device, Board, Linux on Raspberry Pi, Interfaces, Programming and IOT Devices, Case Studies Illustrating IoT Design: Home Automation, Cities and Agriculture.

Total Periods: *55*

TEXT BOOK:

1. Vijay Madisetti and Arshdeep Bahga," *Internet of Things A Hands On Approach*", Universities Press, 2015.

REFERENCE BOOKS:

1. Adrian McEwen, "*Designing the Internet of Things*", Wiely Piblishers, 2014.
2. Daniel Kellmereit, "*The Silent Intelligence: The Internet of Things*". 2013, DND Ventures LLc, 2013

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Computer Science and Engineering

M.Tech (CS) – I Semester

(16MT22504) SOFTWARE TESTING TECHNIQUES

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

PREREQUISITES: A course on "Software Development Methodologies".

COURSE DESCRIPTION: Basic concepts of Software Testing; Testing Techniques – Levels of Testing; Testing Process – Test Planning; Test Metrics and Reports; Software Test Automation.

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

1. Gain knowledge on the Software Testing types and Process for different programming environments.
2. Analyze and apply the appropriate testing techniques suitable for testing the software.
3. Perform testing by applying appropriate strategies for selecting test cases to meet requirements of the product.
4. Apply efficient modern software testing tools for automation.
5. Write test cases and perform defect reporting.

DETAILED SYLLABUS

UNIT-I: BASIC CONCEPTS OF SOFTWARE TESTING (12 Periods)

Fundamentals of software testing - software verification and validation – V test model: V model for software, testing during proposal stage, testing during requirements stage, testing during test-planning phase, test during design phase, VV model, critical roles and responsibilities.

UNIT-II: TESTING TECHNIQUES (12 Periods)

Levels of testing, Acceptance testing, Feature based testing, and Application based testing.

UNIT-III: TESTING PROCESS (11 Periods)

Test planning –test policy, contents, strategy, test plan, Quality plan, test plan template, guidelines, test administration and estimation, standards, building test data, test cases, scenarios, templates for test cases, test scripts, effective test cases, building test data, generation of test data, roles and responsibilities in testing life cycle, test process monitoring.

UNIT-IV: TEST METRICS AND REPORTS (10 Periods)

Testing related data, defect data, efficiency data, categories of test metrics, estimated, budgeted, approved and actual, resources, effectiveness in testing, defect density, defect leakage ratio, residual defect density, test team efficiency, test case efficiency, rework, MTBF/ MTTR, test reports, status reports, integration test reports, system test reports, final test reporting, test status report, Bench marking.

UNIT-V: SOFTWARE TEST AUTOMATION (10 Periods)

Test Automation: Scope of Automation, Design and Architecture of automation, Process Model for Automation, challenges in automation; Load Runner, Selenium, QTP, RFT and RQM.

[Total Periods: 54]

TEXT BOOKS:

1. M. G. Limaye, *"Software Testing: Principles and Techniques and Tools,"* Tata McGraw Hill Education, 1st Edition, 2012.
2. Srinivasan Desikan and Gopalaswamy Ramesh, *"Software Testing: Principles and Practices"*, Pearson education, 2012

REFERENCE BOOKS:

1. Dr. K. V. K. K. Prasad, *"Software Testing Tools,"* Dreamtech, 1st Edition, 2004.
2. Aditya P. Mathur, *"Foundations of Software Testing"*, Pearson, 2008

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech (CS) I Semester
(16MT10531) DATABASE MANAGEMENT SYSTEMS & DATA WAREHOUSING AND DATA MINING LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	*50*	*100*	-	-	*4*	*2*

PRE-REQUISITES:
Courses on "Database Management Systems" and "Data Warehousing and Data Mining"

Course Description:
Hands on practice and implementation of data mining algorithms - Apriori, Fp-tree; Bayesian classification; Back propagation; k-means clustering; Bisecting k-means clustering in C++.
Designing and implement basic SQL Queries, PL/SQL and advanced concepts in PL/SQL such as Object creation structures; Triggers; Embedded SQL using Oracle Database Management System Package.

COURSE OUTCOMES:
After successful completion of this course, the student will be able to:
CO-1: Acquire Practical Knowledge on

- SQL Queries
- Triggers
- Data Mining Algorithms
- Classification , Prediction and Cluster Analysis

CO-2: Analyze Integrity Constraints on databases for validation and Data Mining algorithms for solving real time applications
CO-3:Develop and Design solutions to complex problems related to frequent item sets, classification and clustering.
CO-4: Apply advanced knowledge to identify research challenges, and issues related to databases and data mining.
CO-5: Use modern software tools and technologies for designing simple to complex applications in databases and Data warehousing and data mining.
CO-6: Attitude for independent and continuous learning for improved knowledge with newer versions of DBMS packages and data mining.

'ADBMS' LABORATORY EXERCISES:

1. Consider the following tables:
   Employee(employee_name, street,city)
   Works(employee_name, company_name,salary)
   Company(company_name,city)
   Manages(employee_name,manager-name)

Write the SQL Queries for the following:

a. Find the names and cities of residence of all employees who work for First Bank Corporation.
b. Find the names, street address ad cities of residence of all employees .
c. Find all employees in the database who do not work for First Bank Corporation
d. Find all employees in the database who earn more than each employee of small bank corporation.
e. Assume that the companies may be located in several cities. Find all companies located in every city in which small bank corporation is located.
f. Find the company that has the most employees find those companies whose employees earn a higher salary, on average, than the average salary at First Bank Corporation.

2. Write a PL/SQL block to do the following:
   a. Read a Number and reverse the given number.
   b. Factorial of a given number using while, for and until loops
   c. Check whether the given number is prime or not.
   d. To calculate the sum of individual numbers.

3. a. Write a PL/SQL block that inserts a row and updates salary of an employee in employee table by using update_sal function which takes employee number as argument, calculates increment and returns increment based on the following criteria.

If salary <= 3000 increment = 30% of salary
If salary > 3000 and <= 6000 increment = 20% of salary
Else increment = 10% of salary.

b. Write a stored procedure, raise salary which accepts an employee number. It uses update_salfunction of previous program to get the salary increase amount and uses employee number to select the current salary from employee table. If employee number is not found or if the current salary is null, it should raise an exception. Otherwise, updates the salary.

4. Design and develop a suitable Student Database application by considering appropriate attributes. Couple of attributes to be maintained is the Attendance of a student in each subject for which he/she has enrolled and Internal Assessment Using TRIGGERS for the following:
   a) Whenever the attendance is updated, check if the attendance is less than 85%; if so, notify the Head of the Department concerned.
   b) Whenever, the marks in an Internal Assessment Test are entered, check if the marks are less than 40%; if so, and notify the Head of the Department concerned.

5. Implement Database Objects and creation of object structures for complex relations.
6. Implement C program segment with embedded SQL.

'DATA WAREHOUSING AND DATA MINING' EXERCISES:

1. Implementation of multi dimensional data model using oracle warehouse builder/SQL Server.

'Weka' laboratory Exercises:

2.Demonstration of preprocessing on dataset student.arff
3. Demonstration of preprocessing on dataset labor.arff
4. Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm
5. Demonstration of Association rule process on dataset test.arff using apriori algorithm
6. Demonstration of classification rule process on dataset student.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using j48 algorithm

Implementation of data mining algorithms in C++:

8. Write a C++ program to implement Apriori algorithm and find the frequent item sets.
9. Write a C++ program to implement FP tree algorithm.
10. Write a C++ program to Implement Naïve Bayesian classification algorithm to classify the data.
11. Write a C++ program to Implement of Back propagation algorithm to classify the data.
12. Write a C++ program to Implement K-means clustering algorithm to cluster the data.

REFERENCE BOOKS:

1. Margaret H Dunham, *Data Mining Introductory and Advanced Topics*," 2 ed., Pearson Education, 2006.
2. Amitesh Sinha, "*Data Warehousing*," PHI Learning, 2007.

I M. Tech (CS) I Semester
(14MT10521) DATA STRUCTURES AND ADVANCED DATABASE MANAGEMENT SYSTEMS LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
25	50	75	--	--	4	2

PREREQUISITES: Courses on "Data structures" and "DBMS"

COURSE DESCRIPTION

Practical implementation of linked lists, stacks, queues, binary search tree, AVL tree, B-tree, graphs, N-Queen's problem using C++

Designing and implement basic SQL Queries, PL/SQL and advanced concepts in PL/SQL such as Object creation structures, Triggers, Embedded SQL using Oracle Database Management System Package.

COURSE OUTCOMES:

On successful completion of this course the students will be able to:

CO1. Develop solutions to advanced data structures based problems and advanced DBMS problems.
CO2. Use modern software tools and technologies for designing simple to complex applications in real world.
CO3. Develop effective professional and business communication in data structures and DBMS.
CO4. Attitude for independent and continuous learning for improved knowledge with newer versions of object oriented software and DBMS packages.

Data Structures Exercises:

1. Implementation of Stacks and Queue operations using linked list.
2. Perform the following operations on binary search tree:
   a) Insertion
   b) Deletion
   c) Searching
3. Perform the following operations on AVL-tree:
   a) Insertion
   b) Deletion
4. Implementing the following operations on B-Tree:
   a) Insertion
   b) Searching
   c) Deletion
5. Implement the following using recursive and non-recursive traversals:
   a) Pre-order
   b) In-order
   c) Post-order.

6. Implement the following functions of a dictionary using hashing:
   a) Insertion
   b) Searching
   c) Deletion
7. Implement single source shortest path in a graph by using Bellman and Ford algorithm.
8. Implement N-queen's problem using Backtracking. The N Queen is the problem of placing N chess queens on an N×N chessboard so that no two queens attack each other. The expected output is a binary matrix which has 1s for the blocks where queens are placed. For example following is the output matrix for above 4 queen problem's solution.

```
{0, 1, 0, 0}
{0, 0, 0, 1}
{1, 0, 0, 0}
{0, 0, 1, 0}
```

ADBMS Exercises:

1. Consider the following tables:
   WORKS(Pname, Cname, Salary)
   LIVES(Pname, Street, City)
   LOCATED_IN(Cname, City)
   MANAGER(Pname, Mgrname)
   Where Pname = Person name, Cname = Company name, and Mgrname = Manager name.

   Write the SQL for the following:
   1. List the names of the people who work for the company Wipro along with the cities they live in.
   2. Find the people who work for the company 'Infosys' with a salary more than Rs. 50000/-. List the names of the people, along with the street and city address.
   3. Find the names of the persons who live and work in the same city.
   4. Find the names of the persons who do not work for 'Infosys'.
   5. Find the persons whose salaries are more than that of all of the 'Oracle' employees.
   6. Find the names of the companies that are located in every city where the company 'Infosys' is located.

2. Write a PL/SQL block to do the following:
   a. Read a number n, and print the multiplication table.
   b. Read a number and check whether it is a palindrome or not.
3. a. Write a PL/SQL block that updates salary of an employee in employee table by using incr function which takes employee number as argument, calculates increment and returns increment based on the following criteria.
   If salary <= 3000 increment = 30% of salary
   If salary > 3000 and <= 6000 increment = 20% of salary
   Else increment = 10% of salary.

b. Write a stored procedure, raise salary which accepts an employee number. It uses incr function of previous program to get the salary increase amount and uses employee number to select the current salary from employee table. If employee number is not found or if the current salary is null, it should raise an exception. Otherwise, updates the salary.

4. a. Consider the following Relation Schemas

SALGRADE

GRADE	LOSAL	HISAL

EMP_SAL

ENO	ENAME	SAL	GRADE

Create a database trigger emp_sal. This trigger is forced when an INSERT or an UPDATE is performed on the table EMP_SAL.Trigger to insert into EMP_SAL table when salary between lowsal and highsal (in SALGRADE table).And to update the record in EMP_SAL table.(before)

b. Consider the following Relation Schemas

PERSINFO

EMPNO	NAME	AGE

AUDITPERSINFO

EMPNO	NAME	AGE	OPERATION	ODATE

PERSINFO is the table for which the auditing must be performed and AUDITPERSINFO is the table which keeps track of the records deleted or modified. Create a database trigger audit_trial. This trigger is forced when an UPDATE or a DELETE is performed on the table PERSINFO. It first checks for the operation being performed on the table. Then depending on the operation, a variable (that corresponds to operation) is assigned the value 'UPDATE' or 'DELETE' and then inserts the updated/deleted record into AUDITPERSINFO.

5. Implement Database Objects and creation of object structures for complex relations.
6. Implement C program segment with embedded SQL.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech. (CS) – I Semester
(16MT10532) DATA STRUCTURES AND COMPUTER NETWORKS LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	*50*	*100*	--	--	*4*	*2*

PRE-REQUISITES:
Courses on "Advanced Computer Networks" and "Data Structures"

COURSE DESCRIPTION:
Hands on practical experience on implementing data link layer farming methods and routing algorithms;
Practical implementation of linked lists, stacks, queues, binary tree, binary search tree, AVL tree, B -tree, graphs, N-Queen's problem using C++.

COURSE OUTCOMES:
After successful completion of this course the students will be able to:

CO-1. Gain basic programming skills to implement
a. Framing mechanisms for data link layer,
b. Shortest path using Dijkstra's routing mechanism
c. Distance vector routing mechanism
d. Linear and non-linear data structures, backtracking problems.

CO-2. Analyze data structures for various problem solving techniques and typical performance measures of network models.

CO-3 Design, conceptualize and solve real world problems by providing the best solutions for data structures and networking models.

CO-4:. Use modern software tools and technologies for designing simple to complex applications in real world.

CO-5: Apply advanced knowledge to identify research challenges, and contribute individually or in teams to the development of network projects for real world problems.

CO-6: Develop effective professional and business communication in data structures and networks.

CO-7: Attitude for independent and continuous learning for improved knowledge with newer versions of object oriented software and new simulation models of protocols.

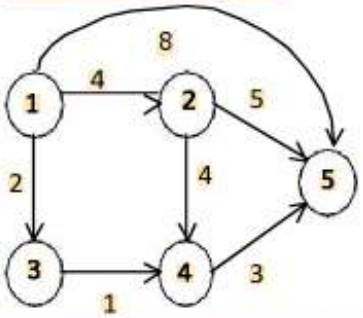
DETAILED SYLLABUS:

LIST OF EXERCISES IN COMPUTER NETWORKS

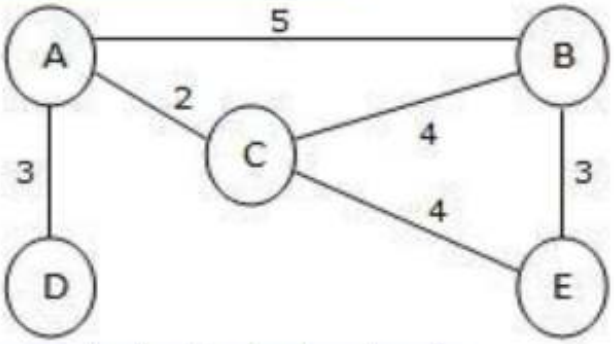
1. Implement the following data link layer farming methods
   a. Character Count
   b. Character Stuffing
   c. Bit Stuffing
2. Design a program to compute checksum for the given frame 1101011011 using CRC-

12, CRC-16, CRC-CCIP. Display the actual bit string transmitted. Suppose any bit from 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 a 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. Write a program to simulates flow based routing
6. Simulate the Random Early Detection congestion control algorithm

LIST OF EXERCISES IN DATA STRUCTURES

1. Implementation of Stacks and Queue operations using linked list.
2. Perform the following operations on binary search tree:
   a) Insertion b) Deletion c) Searching
3. Perform the following operations on AVL-tree:
   a) Insertion b) Deletion
4. Implementing the following operations on B-Tree:
   a) Insertion b) Searching c) Deletion
5. Implement the following using recursive and non-recursive traversals for binary tree:
   a) Pre-order b) In-order c) Post-order
6. Implement the following functions of a dictionary using hashing:
   a) Insertion b) Searching c) Deletion

7. Implement single source shortest path in a graph by using Bellman and Ford algorithm.

8. Implement N-queen's problem using Backtracking. The N Queen is the problem of

placing N chess queens on an N×N chessboard so that no two queens attack each other.The expected output is a binary matrix which has 1s for the blocks where queens are placed. For example following is the output matrix for above 4 queen problem's solution.

{0, 1, 0, 0}
{0, 0, 0, 1}
{1, 0, 0, 0}
{0, 0, 1, 0}

REFERENCE BOOKS:

1. G. A. V. Pai, "Data Structures and Algorithms: Concepts, Techniques and Applications," Mc Graw Hill, First Edition, 2008
2. Nader F. Mir, "Computer and Communication Networks," Pearson Education, 2007.
3. Behrouz A. Forouzan, "Data Communications and Networking," Tata McGraw Hill,
   Fourth Edition, 2007.
4. D. Samanta, "Classic Data Structures," PHI learning, 2005.

I M. Tech (CS) I Semester
(14MT10521) DATA STRUCTURES AND ADVANCED DATABASE MANAGEMENT SYSTEMS LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
25	50	75	--	--	4	2

PREREQUISITES: Courses on "Data structures" and "DBMS"

COURSE DESCRIPTION

Practical implementation of linked lists, stacks, queues, binary search tree, AVL tree, B-tree, graphs, N-Queen's problem using C++

Designing and implement basic SQL Queries, PL/SQL and advanced concepts in PL/SQL such as Object creation structures, Triggers, Embedded SQL using Oracle Database Management System Package.

COURSE OUTCOMES:

On successful completion of this course the students will be able to:

CO1. Develop solutions to advanced data structures based problems and advanced DBMS problems.
CO2. Use modern software tools and technologies for designing simple to complex applications in real world.
CO3. Develop effective professional and business communication in data structures and DBMS.
CO4. Attitude for independent and continuous learning for improved knowledge with newer versions of object oriented software and DBMS packages.

Data Structures Exercises:

1. Implementation of Stacks and Queue operations using linked list.
2. Perform the following operations on binary search tree:
   a) Insertion
   b) Deletion
   c) Searching
3. Perform the following operations on AVL-tree:
   a) Insertion
   b) Deletion
4. Implementing the following operations on B-Tree:
   a) Insertion
   b) Searching
   c) Deletion
5. Implement the following using recursive and non-recursive traversals:
   a) Pre-order
   b) In-order
   c) Post-order.

6. Implement the following functions of a dictionary using hashing:
    a) Insertion
    b) Searching
    c) Deletion
7. Implement single source shortest path in a graph by using Bellman and Ford algorithm.
8. Implement N-queen's problem using Backtracking. The N Queen is the problem of placing N chess queens on an N×N chessboard so that no two queens attack each other. The expected output is a binary matrix which has 1s for the blocks where queens are placed. For example following is the output matrix for above 4 queen problem's solution.

    {0, 1, 0, 0}
    {0, 0, 0, 1}
    {1, 0, 0, 0}
    {0, 0, 1, 0}

ADBMS Exercises:

1. Consider the following tables:
   WORKS(Pname, Cname, Salary)
   LIVES(Pname, Street, City)
   LOCATED_IN(Cname, City)
   MANAGER(Pname, Mgrname)
   Where Pname = Person name, Cname = Company name, and
   Mgrname = Manager name.

   Write the SQL for the following:
   1. List the names of the people who work for the company Wipro along with the cities they live in.
   2. Find the people who work for the company 'Infosys' with a salary more than Rs. 50000/-. List the names of the people, along with the street and city address.
   3. Find the names of the persons who live and work in the same city.
   4. Find the names of the persons who do not work for 'Infosys'.
   5. Find the persons whose salaries are more than that of all of the 'Oracle' employees.
   6. Find the names of the companies that are located in every city where the company 'Infosys' is located.

2. Write a PL/SQL block to do the following:
   a. Read a number n, and print the multiplication table.
   b. Read a number and check whether it is a palindrome or not.
3. a. Write a PL/SQL block that updates salary of an employee in employee table by using incr function which takes employee number as argument, calculates increment and returns increment based on the following criteria.
   If salary <= 3000 increment = 30% of salary
   If salary > 3000 and <= 6000 increment = 20% of salary
   Else increment = 10% of salary.

b. Write a stored procedure, raise salary which accepts an employee number. It uses incr function of previous program to get the salary increase amount and uses employee number to select the current salary from employee table. If employee number is not found or if the current salary is null, it should raise an exception. Otherwise, updates the salary.

4. a. Consider the following Relation Schemas

SALGRADE

GRADE	LOSAL	HISAL

EMP_SAL

ENO	ENAME	SAL	GRADE

Create a database trigger emp_sal. This trigger is forced when an INSERT or an UPDATE is performed on the table EMP_SAL.Trigger to insert into EMP_SAL table when salary between lowsal and highsal (in SALGRADE table).And to update the record in EMP_SAL table.(before)

b. Consider the following Relation Schemas

PERSINFO

EMPNO	NAME	AGE

AUDITPERSINFO

EMPNO	NAME	AGE	OPERATION	ODATE

PERSINFO is the table for which the auditing must be performed and AUDITPERSINFO is the table which keeps track of the records deleted or modified. Create a database trigger audit_trial. This trigger is forced when an UPDATE or a DELETE is performed on the table PERSINFO. It first checks for the operation being performed on the table. Then depending on the operation, a variable (that corresponds to operation) is assigned the value 'UPDATE' or 'DELETE' and then inserts the updated/deleted record into AUDITPERSINFO.

5. Implement Database Objects and creation of object structures for complex relations.
6. Implement C program segment with embedded SQL.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech (CS) – II Semester
(16MT20502) BIG DATA ANALYTICS
(Common to CS & CNIS)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	*60*	*100*	*4*	--	--	*4*

PRE-REQUISITES:
Courses on "Data Base Management Systems" & "Data Warehousing and Data Mining".

COURSE DESCRIPTION:
Concepts of Big Data, Types of Data Elements; Introduction to Hadoop, Hadoop Ecosystem;
Map Reduce; Building Blocks of Hadoop; Big data analytics applications; Predictive and
Descriptive Analytics.

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

CO-1: Gain knowledge in:
- Big data Characteristics
- Hadoop Framework
- Map Reduce.
- Hadoop Release

CO-2: Analyze and develop solutions for database systems for storing and analyzing the large data.

CO-3: Apply Big Data Analytics for estimating the data sets to solve the real world problems.

CO-4: Design and model for an effective database by using big data tools.

CO-5: Carry out research on Predictive Analysis and Sentiment Analysis

CO-6: Learning advance analytics techniques for effective Database monitoring.

DETAILED SYLLABUS:

UNIT I: INTRODUCTION TO BIG DATA: (10 periods)
Big Data Characteristics: Volume-Variety-Velocity-Veracity, Analytics, Basic Nomenclature, 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: INTRODUCTION TO HADOOP: (10 periods)
Data, data types, Storage and Analysis, Relational Database Management Systems, Grid Computing, Volunteer Computing, A Brief History of Hadoop, Apache Hadoop and the Hadoop Ecosystem.

UNIT III – MAPREDUCE: (11 periods)

A weather Dataset: Data format, Analyzing the data with unix tools, Analyzing the data with Hadoop: MapReduce, Java MapReduce, Scaling Out: Data Flow, Combiner Functions, Running a Distributed MapReduce Job, Hadoop Streaming: Ruby, Python, Hadoop Pipes, Compiling and Running.

UNIT IV – HADOOP RELEASES (11 Periods)

The Building Blocks of Hadoop: Name Node-Data Node-Secondary Name Node-Job Tracker-Task Tracker. BIG DATA ANALYTICS APPLICATIONS: Back Testing Analytical Model, Credit Risk Modeling, Fraud Detection, Net Lift Response, Web Analytics, Social Media Analytics, and Business Process Analytics.

UNIT V–PREDICTIVE ANALYTICS AND DESCRIPTIVE ANALYTICS (11 Periods)

Predictive Analytics: Target Definition, Linear Regression, Logistic Regression, Decision Trees, Support Vector Machines, Ensemble Methods, Multiclass Classification Techniques, Evaluating Predictive Models.

Descriptive Analytics: Association Rules, Sequence Rules.

Total No. of Periods: 53

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,*" 3 ed., O'REILLY Publications, 2012.

REFERENCE BOOKS:

1. Paul Zikopoulos, IBM, Chris Eaton, Paul Zikopoulos "*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.

M.Tech (Computer Science) II-Semester
(14MT20506) BIG DATA ANALYTICS (ELECTIVE-II)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

PREREQUISITE: *A Course on* "Data Mining and Warehousing".

COURSE DESCRIPTION

Data Science and Analytics; unsupervised learning; big data from business perspective; Hadoop Technology and application development, Management, InfoSphere big insights and info sphere streams

COURSE OUTCOMES:

On successful completion of this course the students will be able to

CO1. To gain knowledge about the
- Data Science and Unsupervised Learning.
- Big data Characteristics and Methods.
- InfoSphere Big insights and Streams.

CO2. To analyze the need for database systems for storing the large data

CO3. To design and model an effective and sustainable database for better performance using Big data tools.

CO4. To use Hadoop tools and Methodologies for modelling large databases and real time applications

UNIT I - INTRODUCTION TO DATA SCIENCE (Periods:11)

Introduction- Introduction of Data Science-Getting started with R, Exploratory Data Analysis, Review of probability and probability distributions, Bayes Rule Supervised Learning, Regression, polynomial regression, local regression, k nearest neighbors.

UNIT II - UNSUPERVISED LEARNING (Periods:12)

Unsupervised Learning, Kernel density estimation, k means- Naive Bayes, Data and Data Scraping Classification-ranking, logistic regression, Ethics- time series advanced regression, Decision trees, Best practices, feature selection.

UNIT III - BIG DATA FROM DIFFERENT PERSPECTIVES (Periods:11)

Big data from business Perspective- Introduction of big data, Characteristics of big data, Data in the warehouse and data in Hadoop, Importance of Big data, Big data Use cases, Patterns for Big data deployment, Big data from Technology Perspective History of Hadoop, Components of Hadoop, Application Development in Hadoop, Getting your data in Hadoop, other Hadoop Component.

UNIT IV – INFOSPHERE BIG INSIGHTS (Periods:11)

InfoSphere Big Insights- Analytics for Big data at rest, A Hadoop, Ready Enterprise, Quality file system, Compression, Administrative tooling, Security, Enterprise Integration, Improved workload scheduling, Adaptive map reduce, Data discovery and visualization, Machine Analytics.

UNIT V- INFOSPHERE STREAMS **(Periods:10)**

InfoSphere Streams- Analytics for Big data in motion, InfoSphere Streams Basics working of InfoSphere Streams, Stream processing language, Operators, Stream toolkits, Enterprise class.

Total Periods:55

TEXT BOOKS:

1. Noreen Burlingame and Lars Nielsen, "A Simple Introduction To Data Science", New Street Communications, LLC, Wickford, Rhode Island, 2012.
2. Paul Zikopoulos, IBM, Chris Eaton, Paul Zikopoulos "Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data", The McGraw-Hill Companies, 2012.

REFERENCE BOOKS:

1. Anand Rajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012
2. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M.Tech (CS) II Semester
(16MT12501) CLOUD COMPUTING
(Common to SE, CS & CNIS)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

PREREQUISITES: *Courses on* "Operating Systems" and "Computer Networks"

COURSE DESCRIPTION:

Virtualization, Case studies – XEN, VMware, Microsoft Hyper-V; Cloud architecture; Services and Applications; Cloud Programming; Industry practices and Case studies –Amazon Web Services, Google App Engine, and Microsoft Azure.

COURSE OUTCOMES:

After successful completion of this course, students will be able to:

CO1: Demonstrate knowledge on Virtualization models, Cloud Architecture, Services and Programming concepts.
CO2: Analyze the problems in existing cloud architectures.
CO3: Apply concurrent programming, throughput computing and Data intensive computing in Cloud programming.
CO4: Conduct research on emerging technologies in cloud and energy management in cloud
CO5: Apply virtualization techniques to optimize resource sharing.

DETAILED SYLLABUS:

Unit I: Introduction to Virtualization (9 Periods)

Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples – XEN, VMware, Microsoft Hyper-V.

UNIT II: Cloud Architecture (11 Periods)

Introduction to Cloud: Defining Cloud Computing, Cloud Types - The NIST model, The Cloud Cube Model, Deployment models, Service models, Examining the Characteristics of Cloud Computing, Paradigm shift, Benefits of cloud computing, Disadvantages of cloud computing, Assessing the Role of Open Standards.

Cloud Architecture: Exploring the Cloud Computing Stack, Composability, Infrastructure, Platforms, Virtual Appliances, Communication Protocols, and Applications.

UNIT III: Defining Cloud Services (10 Periods)

Defining Infrastructure as a Service (IaaS) – IaaS workloads, Pods, aggregation, and silos, **Defining Platform as a Service (PaaS), Defining Software as a Service (SaaS)** – SaaS characteristics, Open SaaS and SOA, Salesforce.com and CRM SaaS, **Defining Identity as a Service (IDaaS)** – Introduction to identity, Networked identity service classes, Identity system codes of conduct, IDaaS interoperability, **Defining Compliance as a Service (CaaS)**.

UNIT IV: Cloud Programming Concepts (12 Periods)

Concurrent Programming – Introduction to Parallelism for Single Machine Computation, Programming Applications with Threads, **High Throughput Computing** – Task Programming, Task based Application Models, **Data Intensive Computing** – Introduction to Data Intensive Computing and Technologies for Data Intensive Computing.

UNIT V: Industrial Platforms and Trending Developments (13 Periods)

Case Studies on Cloud Platforms – Amazon Web Services, Google App Engine, and Microsoft Azure, Case Studies on Cloud Applications – Scientific Applications, Business and Consumer Applications.

Enhancements in Cloud – Energy Efficiency in Clouds, Market based Management of Clouds, Federated Clouds / InterCloud, Third Party Cloud Services.

Total Periods: 55

TEXT BOOKS:

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, "*Mastering Cloud Computing: Foundations and Applications Programming,*" 1st Edition, McGraw Hill,New Delhi, 2013.
2. Barrie Sosinsky, "*Cloud Computing Bible,*" 1st Edition, Wiley India Pvt Ltd, New Delhi,2011.

REFERENCE BOOKS:

1. Anthony T. Velte, Toby J. Velte Robert Elsenpeter, "*Cloud Computing: A Practical Approach,*" 1st Edition, Tata McGraw Hill, 2010.
2. George Reese, "*Cloud Application Architectures,*" 1st Edition, O'Reilly Publishers, 2010.

M. Tech. (CS)-II Semester
(14MT20509) VIRTUALIZATION AND CLOUD COMPUTING
(ELECTIVE-II)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	--	--	4

PREREQUISITES: *Courses on* "Distributed Computing" and "Computer Networks"

COURSE DESCRIPTION:
Introduction to Cloud Computing and virtualization; Map reduce programming; Cloud technologies – Amazon web services, Google App Engine, and Microsoft Azure; Scientific and business applications of Cloud

COURSE OUTCOMES:
On successful completion of this course the students will be able to
CO1. Gain Knowledge on the technical foundations of Cloud technology.
CO2. Analyze the Cloud Architectures while developing the internet web applications.
CO3. Solve security issues in cloud applications.
CO4. Get exposure to cloud tools like Microsoft Azure, Google App Engine, and Amazon Web Services.

UNIT- I: VIRTUALIZATION (Periods:13)
Introduction to Virtualization, Objectives of Virtualization, History of Virtualization, benefits of virtualized technology, The virtual service desk, related forms of computing, Understanding Hypervisors, Load balancing & Virtualization. Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples-Xen, Para virtualization, VMware, Full Virtualization, Microsoft Hyper-V.

UNIT-II: CLOUD COMPUTING OVERVIEW (Periods:12)
Cloud computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, A Closer Look, Cloud Computing Reference Model, Characteristics and Benefits, Pros and Cons of cloud, Challenges ahead, Historical Developments, Building Cloud Computing Environments, Computing Platforms and Technologies

CLOUD COMPUTING ARCHITECTURE
Cloud Reference Model, Types of Clouds, Economics of the Cloud, Open Challenges.

UNIT- III: DATA INTENSIVE COMPUTING: MAP-REDUCE PROGRAMMING (Periods:10)
Data-Intensive Computing, Technologies for Data-Intensive Computing, Aneka Map Reduce Programming.

UNIT-IV: CLOUD TECHNOLOGIES (Periods:10)
Amazon Web Services- Compute Services, Storage Services, Communication Services, Additional Services, **Google AppEngine** -Architecture and Core Concepts, Application Life-Cycle, **Microsoft Azure**-Azure Core Concepts, SQL Azure, Windows Azure Platform Appliance.

UNIT-V: CLOUD APPLICATIONS: **(Periods:13)**

Scientific Applications, Business and Consumer Applications

ADVANCED TOPICS IN CLOUD COMPUTING-Energy Efficiency in Clouds, Market Based Management of Clouds, InterCloud.

Total Periods:58

TEXT BOOKS:

1. Raj Kumar Buyya, Christian Vecchiola, S.Thamarai Selvi, *"Mastering Cloud Computing,"* Tata McGraw Hill ,New Delhi,2013.
2. Ivanka Menken, Gerard Blokdijk, *"Cloud Computing Specialist Certification Kit – Virtualization, The Art of Service,"* Emereo Pty Ltd, 2009.

REFERENCE BOOKS:

1. Michael Miller, *"Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online,"* Que Publishing, Pearson, August 2011.
2. George Reese, *"Cloud Application Architectures Building Applications and Infrastructure in the Cloud,"* O'Reilly Media Released, April 2009.
3. Gautham Shroff, *"Enterprise Cloud Computing: Technology, Architecture, Application,"* Cambridge University Press, 2010.
4. Barrie Sosinky, *"Cloud Computing Bible"*, Wiley Publishing Inc, 2011.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Computer Science and Engineering

M.Tech (CS) II Semester

(16MT22505) WEB TECHNOLOGIES

(Common to SE and CS)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

PREREQUISITES: A course on "Object Oriented Programming".

COURSE DESCRIPTION: Web Technologies: HTML5, CSS, JavaScript, JQuery; Open source server-side scripting language- PHP; MySQL database concepts; and AJAX.

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

CO1: Gain knowledge on web technologies.

CO2: Analyze the functionality of client as well as server side web technologies for validating web pages.

CO3: Gain programming skills to design and develop novel web applications

CO4: Apply web technologies to make web pages more interactive, scalable and user friendly web applications.

DETAILED SYLLABUS

UNIT–I: HTML5 AND CSS3 (14 Periods)

HTML5: Overview of HTML and XHTML, HTML5 - Introduction, HTML5 Document Structure, Creating Editable Content, Checking Spelling Mistakes, Exploring Custom Data Attributes, Microdata, Client-Side Storage, Drag and Drop Feature, ARIA Accessibility, Offline Web Applications, Web Communications, Cross-Document Messaging and Desktop Notifications, 2D and 3D Graphics; **CSS3**: Introduction, Features of CSS3, Syntax of CSS, Exploring CSS selectors, Inserting CSS in HTML Document, State of CSS3.

UNIT–II: JAVASCRIPT AND JQUERY (10Periods)

JavaScript: Overview of JavaScript, JavaScript Functions, Events, Image Maps and Animations, JavaScript Objects; **JQuery**: Fundamentals of JQuery, JQuery Selectors, JQuery Methods to Access HTML Attributes and Traversing, JQuery Manipulators, Events and Effects.

UNIT–III: INTRODUCTION TO PHP **(10 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 **(10Periods)**

PHP and Web Forms, Sending Form Data to a Server, Authenticating Users with PHP, Session Handlers, PHP with MySQL, Interacting with the Database, Database Transactions.

UNIT–V: AJAX **(08Periods)**

Exploring Different Web Technologies, Exploring AJAX, Creating a Sample AJAX Application, Displaying Date and Time using AJAX, Creating the XML HttpRequest Object, Reading a File Synchronously and Asynchronously, Reading Response Headers, Loading List Boxes Dynamically using XML HttpRequest Object, JQuery with AJAX, Validating a Field using AJAX and PHP.

[Total Periods: 52]

TEXT BOOKS:

1. Kogent Learning Solutions Inc, *"HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery,"* 1st Edition, Dreamtech Press, 2011.
2. W. Jason Gilmore, *"Beginning PHP and MySQL,"* 4th Edition, APress, 2011.

REFERENCE BOOKS:

1. Andrea Tarr, *"PHP and MySQL,"* 1st Edition, Willy India, 2012.
2. Thomas A. Powell, *"The Complete Reference: HTML and CSS,"* 5th Edition, Tata McGraw Hill, 2010.
3. Steve Suehring, Tim Converse and Joyce Park, *"PHP6 and MySQL,"* 1st Edition, Willy India, 2009.
4. P. J. Deitel and H. M. Deitel, *"Internet & World Wide Web How to Program,"* 4th Edition, Pearson, 2009.

M. Tech. (CS)-II Semester
(14MT20505) WEB PROGRAMMING

Int Marks	Ext Marks	Total Marks	L	T	P	C
40	60	100	4	--	--	4

PREREQUISITES: *Courses on* "Programming in C" and "JAVA".

COURSE DESCRIPTION:
Introduction to HTML, Cascaded Style sheets and Java Scripting; Dynamic HTML and XML; PHP and Web Forms; Web Applications using PHP and MYSQL

COURSE OUTCOMES:
On successful completion of this course the students will be able to :
CO1. Gain knowledge in
- HTML and CSS styling.
- Dynamic HTML with Java Script and XML.
- PHP dynamic programming and interaction with databases.

CO2. Analyze the design problems in HTML Web pages with CSS.
CO3. Design a dynamic webpage with HTML, CSS, Java Script, PHP concepts.
CO4. Assess the HTML Website using XML Parsers.
CO5. Create website of societal context for awareness on social and environmental issues.

UNIT – I: INTROUDCTION TO HTML AND CSS (Periods:11)
Hyper Text Markup Language: Basic HTML, the Document Body, Text, Hyper Links, Adding More Formatting, Lists, Using Color and Images, Images.
More HTML: Tables, Multimedia Objects, Frames, Forms – Towards Interactivity, The HTML Document Head in detail.
Cascading Style Sheets: Introduction, Using Styles, Defining Styles, Properties and Values in Style Sheets, Formatting Blocks of Information, Layers
UNIT – II: JAVA SCRIPTING (Periods:11)
An Introduction to Java Script: Dynamic HTML, Java Script: Basics, Variables, String Manipulation, Mathematical Function, Statements, Operators, Arrays, Functions.
Objects in Java Script: Data and Objects in Java Script, Regular Expressions, Exception Handling, Built – in Objects, Cookies, Events.
UNIT –III: ADVANCED JAVASCRIPTING AND XML (Periods:12)
Dynamic HTML With JavaScript: Data Validation, Opening in a new window, Messages and Confirmations, The Status Bar, Writing to a different frame, Rollover Buttons, Moving Images, A Text Only Menu System, Floating Logos.
XML: Defining Data for Web Applications: Basic XML, Document Type Definition, XML Schema, Document Object Model, Presenting XML, Using XML Parser.

UNIT – IV: PREPROCESSOR HYPERTEXT PROGRAMMING (Periods:14)

An Introduction To PHP: PHP, Introducing PHP, Including PHP in a HTML Page, Data Types, Program Control Structures, Arrays, User Defined Functions, Built-in Functions, Regular Expressions, Using files.

Advanced PHP: PHP and Web Forms, Handling File Uploads: Uploading files with PHP, Session Handlers: Working with Sessions.

UNIT – V: BUILDING WEB APPLICATIONS WITH PHP AND MYSQL (Periods:07)

Building Web Applications With PHP And MYSQL: Handling Installation Prerequisites, **Using the mysqli Extension** - Setting Up and Tearing down the Connection, Handling Connection Errors, Retrieving Error Information, Storing Connection Information in a Separate File, Securing Your Connection Information.

Interacting with the Database - Sending a Query to the Database, Parsing Query Results, Determining the Rows Selected and Rows Affected, Working with Prepared Statements, Executing Database Transactions, and Enabling Auto commit Mode, Committing a Transaction, Rolling Back a Transaction.

Total Periods:56

TEXT BOOKS:

1. Chris Bates, *"Web Programming: Building Internet Applications,"* Third Edition, New Delhi, India: Wiley India Pvt. Ltd., 2009.
2. W Jason Gilmore, *"Beginning PHP and MySQL: From Novice to Professional,"* Fourth edition, New Delhi, India: Springer India Pvt. Ltd., 2011.

REFERENCE BOOKS:

1. Robin Nixon, *"Learning PHP, MySQL, and JavaScript,"* Second edition, Sebastopol, CA: O'Reilly Media, Inc., 2012.
2. Kevin Tatroe, Peter MacIntyre, and Rasmus Lerdorf, *"Programming PHP,"* Third edition, Sebastopol, CA: O'Reilly Media, Inc., 2002.
3. Marc Wandschneider, *"Core Web Application Development with PHP and MySQL,"* First edition., Prentice Hall Professional Technical Reference, 2006
4. David Flanagan, *"JavaScript: The Definitive Guide,"* Sixth Edition, Sebastopol, CA: O'Reilly Media, Inc., 2011.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M.Tech (CS) II-Semester
(16MT20504) EMBEDDED SYSTEMS
(PROFESSIONAL ELECTIVE–II)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	*60*	*100*	*4*	--	--	*4*

PRE-REQUISITES:
Courses on Computer Organization & Operating Systems

COURSE DESCRIPTION:
Concepts of Embedded System components, Micro controller programming; Programming in Embedded Systems, design using hardware and software components; Real-Time Operating systems, Embedded Product Development Life Cycle .

COURSE OUTCOMES:
After successful completion of this course the students will be able to:

CO-1: Gain advanced knowledge in
- Embedded system components.
- Micro controller programming.

CO-2: Analyze critical problems related to programming for hardware and software components by conducting detailed research.

CO-3: Apply and solve issues in computer based systems using a range of solutions provided by Embedded Systems..

CO-5: Use appropriate techniques, tools, resources and usage of modern Embedded Product Development Life Cycle (EDLC) tools for the design and development of Embedded Systems.

DETAILED SYLLABUS

UNIT I - INTRODUCTION TO EMBEDDED SYSTEMS (11 Periods)
Embedded Systems, History, classification, application areas, purpose. Core of Embedded systems, memory, sensors and actuators, communication Interface, firmware, other system components, PCD and Passive components. Embedded systems Applications and domain specific.

UNIT II -MICRO CONTROLLER (11 Periods)
8051 Architecture, Real World Interfacing, Introduction to Advanced Architectures, Processor and Memory Organization, Instruction -level parallelism, memory-types, memory-maps and addresses, processor selection, memory selection.

UNIT III-EMBEDDED SYSTEM DESIGN AND DEVELOPMENT (11 Periods)

Hardware Design: Analog and Digital components, VLSI circuit Design, EDA tools, PCB Layout design and Fabrication.

Firmware Design and Development: Firmware design approaches, development languages, Programming

UNIT IV-PROCESSES AND REAL - TIME OPERATING SYSTEM (11 Periods)

OS-basics-types-tasks, process and threads-Multi-processing and Multi-tasking-Task Scheduling-Task communication-Task Synchronization-Device Drivers-Case study: VxWorks and MicroC/OS-II.

UNIT V-EMBEDDED SYSTEM DEVELOPMENT (11 Periods)

Integrated Development Environment, Cross-compilation, De-compiler, simulators, Emulators, Debuggers. **Embedded Product Development Life cycle**: EDLC-the EDLC Objectives -Phases-Modeling.

TOTAL PERIODS: 55

TEXT BOOKS:

1. SHIBU KV, "Introduction to Embedded Systems", Fifth Edition, McGraw Hill ,2012.
2. Manish K Patel, "Microcontroller based Embedded Systems", McGraw Hill ,2014.

REFERENCE BOOKS:

1. Wayne Wolf, "Computers as Components -Principles of Embedded Computing System Design", Morgan Kaufman Publishers, First Indian Reprint, 2001.
2. Steve Heath, "Embedded Systems Design", Second Edition, Newnes Publications, 2003.
3. David E. Simon, "An Embedded Software Primer", Pearson Education, First Indian Reprint, 2000.

M. Tech. (CS)-I Semester
(14MT10507) EMBEDDED SYSTEMS (ELECTIVE-I)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	--	--	4

PREREQUISITES: *Courses on* "Computer Organization" and "Operating Systems".

COURSE DESCRIPTION

Introduction to Embedded Systems and components; Micro controller and embedded programming; Processes and Real time operating systems; Embedded Systems development

COURSE OUTCOMES:

On successful completion of this course the students will be able to

CO1. Gain advanced knowledge in
- Embedded system components.
- Micro controller programming.
- Programming in Embedded systems.

CO2. Analyze complex engineering problems critically for conducting research in Embedded Systems.

CO3. Solve engineering problems with wide range of solutions in Embedded Systems.

CO4. Apply appropriate techniques, resources and tools in the design and development of Embedded Systems.

UNIT-I: INTRODUCTION TO EMBEDDED SYSTEMS (Periods:12)

Introduction, Complex systems and Microprocessors, Component fundamentals and Design, Processor embedded into a system, Embedded hardware units and Devices in a system, Embedded software in a system, examples of embedded system, embedded System-on-chip (Soc) and Use of VLSI circuit design technology, Complex systems design and Processors, Design process in Embedded System, formalization of system design, Classification of Embedded Systems.

UNIT-II: MICRO CONTROLLER (Periods:12)

8051 Architecture, Real World Interfacing, Introduction to Advanced Architectures, Processor and Memory Organization, Instruction-level parallelism, memory-types, memory-maps and addresses, processor selection, memory selection.

UNIT-III: EMBEDDED PROGRAMMING (Periods:12)

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:** Header and Source Files and Preprocessor Directives, Program Elements: Macros and Functions, Program Elements: Data Types, Data Structures, Modifiers, Statements, Loops and Pointers.

UNIT-IV: PROCESSES AND REAL-TIME OPERATING SYSTEMS (Periods:14)

Processes, Threads and Tasks: Multiple Processes in an Application, Multiple Threads in an Application, 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.

UNIT-V: EMBEDDED SYSTEM DEVELOPMENT (Periods:10)

Embedded Software Development Process and Tools: Introduction to Embedded Software, Development Process and Tools, Host and Target Machines, Linking and Locating Software, Getting Embedded Software into the Target System, Issues in Hardware–Software Design and Co-design. Testing on Host Machine, Simulators, and Laboratory Tools

Total periods: 60

TEXT BOOKS:

1. Rajkamal, "Embedded Systems Architecture - Programming and Design," Tata McGraw Hill, Second Edition, 2003.

REFERENCE BOOKS:

1. Wayne Wolf, *"Computers as Components - Principles of Embedded Computing System Design,"* Morgan Kaufman Publishers, First Indian Reprint, 2001.
2. Steve Heath, *"Embedded Systems Design,"* Second Edition, Newnes Publications, 2003.
3. David E. Simon, *"An Embedded Software Primer,"* Pearson Education, First Indian Reprint, 2000.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech. II-Semester
(16MT20531) CLOUD COMPUTING & BIG DATA ANALYTICS LAB
(Common to CS and CNIS)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	--	--	4	2

PRE-REQUISITES:
Course on "Cloud Computing" and "Operating Systems"

COURSE DESCRIPTION:
Hands-on experience on creating Virtual machines on Windows and Linux platforms, Development of Service based web applications & their deployment and Mobile app development, Designing and implementing Hadoop cluster.

COURSE OUTCOMES:
After successful completion of this course , students will be able to:

***CO-1*:** Demonstrate hands-on experience on Virtualization models, Cloud Environment and Hadoop cluster setup.
***CO-2*:** Analyze the given experiment and measure the performance of services and datasets.
***CO-3*:** Apply API development skills in web applications for Cloud deployment and develop solutions for real time applications using Hadoop.
***CO-4*:** Devise virtual environments based on virtualization techniques and processing huge amount of data using Big data tools
***CO-5*:** Develop written and oral communications in preparing and presenting reports.

LIST OF PRACTICAL EXERCISES:

1 : Create Virtual machines with given set of configuration on Hyper-V, " Ubuntu 14 LTS OS, with 2 GB RAM and 200 GB HDD". (IaaS)
2: Create Virtual machines with given set of configuration on Ubuntu OS: "Windows 7 OS with 4 GB RAM and 500 GB HDD". (IaaS)
3: Develop a Design document for a web application, to perform operations based on service calls and to be deployed on cloud environment. (Design Doc)
4: Develop a web application for performing Calculator operations be selecting relevant services. Deploy it on cloud platform. (SaaS)
5: Develop a HTTPS web application with social media interfaces (Facebook / Twitter / Instagram / Google+ APIs). (SaaS)
6: Develop a mobile app on Google App Engine for uploading a resume into a website, collaborated with Drop box. The resume should be encrypted. (PaaS)
7: Develop a service call to run on Drop box resumes for picking the resumes of given skill set. (PaaS)

i. 6+ years of Exp in Java Development.
ii. 10 years of experience in Automation Testing.

iii. 15+ years of Managerial experience with technical background.
iv. 5-7 years of on-site experience in .NET support and programming.

8: Install and run Hadoop using Single node Cluster.
9: Install and run Hadoop using Multi node cluster
10: Write a program to count words in a program using map and reduce functions and Hadoop.
11: Illustrate installation and configuring of Hive

REFERENCE BOOKS:

1: Ivanka Menken and Ivanka Menken, "*Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book,*" 1 st Edition, Emereo Pty. Ltd., 2009.
2: Barrie Sosinsky, "*Cloud Computing Bible,*" 1st Edition, Wiley India Pvt Ltd, 2011.
3: Tom White, "*Hadoop: The Definitive Guide*," 3rd Edition, O'REILLY Publications, 2012.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Computer Science and Engineering

M. Tech – II Semester

(16MT20532) OBJECT ORIENTED ANALYSIS & DESIGN LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	--	--	4	2

PRE-REQUISITES:

A Course on "Object Oriented Programming"

COURSE DESCRIPTION:

Concepts of Unified Modeling language; Sequence and collaboration diagrams; Behavioral Modeling; Unified Process and phases of unified process.

COURSE OUTCOMES:

After successful completion of this course the students will be able to:

CO-1: Demonstrate knowledge on Object Oriented concepts, project planning and modeling concepts.

CO-2: Analyze and understand requirements of given real life problems.

CO-3: Design Structural and Behavioral Diagrams to solve real world problems.

CO-5: Apply UML to develop blueprints of a given problem.

CO-6: Develop written and oral communications in preparing and presenting reports.

CO-7: Update knowledge in object oriented analysis and design continuously

LIST OF EXERCISES:

Case Study No: 1

Problem Title: 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 No: 2

Problem Title: Online Ticket Reservation for Railways

Problem Statement:

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, data of journey, destination, class of train etc. The

reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes ie Sleeper class, First class and the AC compartment. Design the application for the above problem description.

Case Study No: 3

Problem Title: 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 are 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 No: 4

Problem Title: University Course Information System

Problem Statement:

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

Case Study No: 5

Problem Title: Hospital Management System

Problem Statement:

Hospital Management System (HMS) is state-of-the-art software that offers comprehensive solutions to various segments of Healthcare Industry such as Super Specialty, Multispecialty and General Hospitals of varied capacities, small Nursing Homes, HMOs, Polyclinics and General Practitioners. This HMS solution addresses the issues from multi-discipline angels namely Patients, Doctors, Pharmacy, Hospital Management and Services.

The Software provides both clinical as well as patient care aspects to hospital management. The software is divided into different

modules, each addressing a specific activity of the hospital and there by facilitating better patient care. Each module can be used as a standalone solution or can be integrated in a phased manner. Modules are designed so that they meet the present and future requirements of the hospital.HMS offers various sub-systems and a seamless integration. By being modular, each module can be used as a standalone solution or can be integrated in a phased manner. Modules are also so designed to meet the present as well as future requirements of the organization and process a unique ability with the business growth.HMS consists of the Base modules, Add-on modules and Specialty modules. Additional modules both add-on and specialty modules can be seamlessly integrated to the HMS at any time. The Integration Manager takes care of all the data consistency issues.

Case Study No: 6

Problem Title: Unified Library Application

Problem Statement:

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

Case Study No: 7

Problem Title: Online Shopping

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 No: 8

Problem Title: Passport Automation System

Problem Statement:

Passport Automation System (PAS) is used in the effective dispatch of passport to all of the applicants. This system adopts a comprehensive approach to minimize the manual work and schedule resources, time in a cogent manner. The core of the system is to get the online registration form (with details such as name, address etc.,) filled by the applicant whose testament is verified for its genuineness by the Passport Automation System with respect to the already existing information in the database.

This forms the first and foremost step in the processing of passport application. After the first round of verification done by the system, the information is in turn forwarded to the regional administrator's (Ministry of External Affairs) office. The application is then processed manually based on the report given by the system, and any forfeiting identified can make the applicant liable to penalty as per the law. The system forwards the necessary details to the police for its separate verification whose report is then presented to the administrator. After all the necessary criteria have been met, the original information is added to the database and the passport is sent to the applicant.

Case Study No: 9

Problem Title: Recruitment Procedure for Software Industry

Problem Statement:

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

The technical skill and the experience of the candidates are reviewed and the sort listed candidates are called for the interview. There may be different rounds for interview like the written test technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidate's 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.

REFERENCE BOOKS:

R1. Mark Priestley, "Practical Object-Oriented Design with UML," Second Edition, Tata McGraw Hill, 2011.

R2. Mike O' Docherty, "Object-Oriented Analysis and Design with UML Version 2.0," Wiley India Pvt. Ltd, 2012.

M. Tech. (CS)-II Semester
(14MT20522) WEB PROGRAMMING AND OOAD LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
25	50	75	-	-	4	2

PREREQUISITES: *Courses on* "Web Programming" and "Object Oriented Programming".

COURSE DESCRIPTION

Develop and implement dynamic web applications on contemporary and social issues using HTML, CSS, JS and PHP technologies.

Hands on practice in using Visual Modeling Tools and design real time case studies such as Automated Teller Machine (ATM), Online Ticket Reservation for Railways, A Point-of-Sale (POS) System, A Multi-Threaded Airport Simulation, Hospital Management System, Unified Library Application, and Online Shopping.

COURSE OUTCOMES:

On successful completion of this course the students will be able to:

CO1. To apply knowledge of UML to design an object-oriented system
CO2. Gain knowledge in designing web pages using HTML, CSS, JS.
CO3. Analyze XML files using DTD parser.
CO4. Use Dreamweaver and Notepad++ for designing web pages and generating dynamic content.
CO5. Develop websites for self development and for promoting awareness among the community in societal and Environmental issues
CO6. Engage in lifelong learning by incorporating the best design practices.

OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY EXERCISES:

Draw the UML diagrams for the following case studies:

OOAD Tool to be used: Rational Rose, visual paradigm

Operating System: windows XP

Case Study No: 1

Problem Title: 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 No: 2
Problem Title: Online Ticket Reservation for Railways
Problem Statement:
Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, data of journey, destination, class of train etc. The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes ie Sleeper class, First class and the AC compartment. Design the application for the above problem description.

Case Study No: 3
Problem Title: 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 are 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 No: 4
Problem Title: A Multi-Threaded Airport Simulation
Problem Statement: Simulate the operations in an airport. Your application should multiple aircrafts using several runways and gates avoiding collisions/conflicts. Loading: an aircraft uses the runway, lands, and then taxis over to the terminal. Take-Off an aircraft taxies to the runway and then takes off.

Case Study No: 5
Problem Title: Hospital Management System
Problem Statement:
Hospital Management System (HMS) is state-of-the-art software that offers comprehensive solutions to various segments of Healthcare Industry such as Super Specialty, Multi-specialty and General Hospitals of varied capacities, small Nursing Homes, HMOs, Polyclinics and General Practitioners. This HMS solution addresses the issues from multi-discipline angels namely Patients, Doctors, Pharmacy, Hospital Management and Services.

The Software provides both clinical as well as patient care aspects to hospital management. The software is divided into different modules, each addressing a specific activity of the hospital and there by facilitating better patient care. Each module can be used as a standalone solution or can be integrated in a phased manner. Modules are designed so that they meet the present and

future requirements of the hospital. HMS offers various sub-systems and a seamless integration. By being modular, each module can be used as a standalone solution or can be integrated in a phased manner. Modules are also so designed to meet the present as well as future requirements of the organization and process a unique ability with the business growth.HMS consists of the Base modules, Add-on modules and Specialty modules. Additional modules both add-on and specialty modules can be seamlessly integrated to the HMS at any time. The Integration Manager takes care of all the data consistency issues.

Case Study No: 6

Problem Title: Unified Library Application

Problem Statement:

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

Base Modules:

- Appointments , Registration, Consultation (OP),Ward Management(IP), Billing and Accounts,
- Packages and Health Plans , Corporate and Insurance, Electronic Medical Records, Services (Test/Results)

Case Study No: 7

Problem Title: Online Shopping

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, PDAs, touch screens.

WEB PROGRAMMING LABORATORY EXERCISES:

1. Create an HTML web page with at least the following features:
   Keywords & description meta tags, title, Page formatting, including a background color *and* picture, a non-default text color, and non-default text and link colors, A horizontal rule, At least three levels of headers, Text formatting, including specifying a non-default font as well as centered, bold, italics, subscript, superscript, and strikeout, A three-level bulleted list and a two-level numbered list, At least two external links, with one a text link and one an image link, Three internal "bookmark" links – that is, a link to further down on the current page, A relative link to an image in a different directory than the directory in which your current HTML page resides, An image with a non-standard-width border in a non-standard color. The image should appear off to the right side of the page, an image map with at least three links, a table that includes at

least three rows, two cells in each row, two cols pan attributes, and one row span attribute. Put a background color on the entire table, a different background color on one cell, and a background image on one entire row of the table.

2. Create an HTML web page with JavaScript for the following problem:
   Get two input numbers from an HTML form. On submit, call a function to edit them to make sure that they are within the range of 1-100. If not, display an error message and set focus to the field in error. If the entered numbers are valid, add the two numbers together and display the total in an alert box. Pop up a prompt box to get a third number and edit it to make sure it's in the range of 1 to 5. Multiply the original total (from the two input boxes) by this third number. Store the result in a cookie and then automatically open a second page to display the cookie that you saved on the prior page.
3.
   a. Write an XML file which will display the Book information which includes the following:
      1) Title of the book 2) Author Name 3) ISBN number
      4) Publisher name 5) Edition 6) Price
   b. Write a Document Type Definition (DTD) to validate the above XML file. Display the XML file as follows:
      The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns. Use XML schemas XSL and CSS for the above purpose. Note: Give at least for 4 books. It should be valid syntactically. Hint: You can use some xml editors like XML-spy.
4. Write PHP Script to demonstrate
   a. String processing in PHP
   b. File uploading
   c. Sessions and Cookies
5. Write PHP Script that takes user input data (Personal Information like registration to a website) in a form and validates it and write the data into the database.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Computer Science and Engineering
M. Tech. – II Semester
(16MT23810) INTELLECTUAL PROPERTY RIGHTS
(Common to all M. Tech. Programs)
(Audit Course)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
-	-	-	-	2	-	-

PRE-REQUISITES: --
COURSE DESCRIPTION:
Introduction to Intellectual Property; Trade Marks; Law of Copy Rights; Law of Patents; Trade Secrets; Unfair Competition; New Development of Intellectual Property.
COURSE OUTCOMES: After successful completion of the course, students will be able to:

1. Demonstrate in-depth knowledge on
    a. Intellectual Property
    b. Trade Marks & Secrets
    c. Law of Copy Rights, Patents
    d. New development of Intellectual Property
2. Analyze the different forms of infringement of intellectual property rights.
3. Solve problems pertaining to Intellectual Property Rights.
4. Stimulate research zeal for patenting of an idea or product.
5. Write effective reports required for filing patents.
6. Develop life-long learning capabilities.
7. Develop awareness of the relevance and impact of IP Law on their academic and professional lives.
8. Develop attitude for reflective learning.

DETAILED SYLLABUS:
UNIT - I: Introduction to Intellectual property (5 Periods)
Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.
UNIT - II: Trade Marks: (5 Periods)
Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.
UNIT - III: Law of copy rights: (6 Periods)
Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.
Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer

UNIT - IV: Trade Secrets: **(6 Periods)**

Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

Unfair competition: Misappropriation right of publicity, False advertising.

UNIT - V: New development of intellectual property: **(6 Periods)**

New developments in trade mark law; copy right law, patent law, intellectual property audits.

International overview on intellectual property, international - trade mark law, copy right law, international patent law, international development in trade secrets law.

[Total Periods: 28]

REFERENCE BOOKS:

1. Deborah, E. Bouchoux, *Intellectual property rights*, Cengage learning.
2. Prabuddha Ganguli, *Intellectual property right - Unleashing the knowledge economy*, Tata Mc Graw Hill Publishing Company Ltd.