Vidya Jyothi Institute of Technology

(An Autonomous Institution)

(Accredited by NAAC & NBA, Approved by AICTE New Delhi & Permanently Affiliated to JNTUH)

Aziznagar Gate, C.B. Post, Hyderabad-500 075

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B. Tech SYLLABUS

2018

Applicable for students admitted into B.Tech (Regular) from 2018-19

COURSE STRUCTURE & DETAILED SYLLABUS

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.TECH II Year 1st Semester

S. No.	Category	Course Title	L	T	P	Credits
1	BS	Probability and Statistics	3	0	0	3
2	ES	Digital Logic Design	3	0	0	3
3	ES	Electronic Devices Circuits	3	0	0	3
4	PC-1	Data Structures	3	0	0	3
5	PC-2	Mathematical Foundation of Computer Science	3	0	0	3
6	PC-3	Python Programming	3	0	0	3
7	PC Lab	Data Structures & Python Programming lab	0	0	2	1
8	ES Lab	Digital Logic Design & Electronic Devices Circuits Lab	0	0	2	1
9	MC-1	Gender Sensitization/Environmental Science	2	0	0	0
Total number of Credits						**20**

II Year 2nd Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-4	Design & Analysis of Algorithms	3	1	0	4
2	PC-5	Computer Organization	3	0	0	3
3	PC-6	Java Programming	3	0	0	3
4.	PC-7	Software Engineering	3	0	0	3
5	PC-8	Database Management Systems	3	0	0	3
6	H&S	~~Soft Skills for Success~~ Professional Communication	1	0	2	2
7	PC Lab	Java Programming Lab	0	0	2	1
8	PC Lab	Database Management Systems Lab	0	0	2	1
9	MC-2	Gender Sensitization/Environmental Science	2	0	0	0
Total number of Credits						**20**

III Year 1st Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-9	Computer Networks	3	0	0	3
2	PC-10	Operating Systems	3	0	0	3
3	PC-11	Web Technologies	3	0	0	3
4	PC-12	Formal Languages and Automata Theory	3	0	0	3
5	PE-1	Human Computer Interaction Linux Programming Software Project Management	3	0	0	3
6	OE – 1		3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	PC Lab	Web Technologies Lab	0	0	2	1
9	Value added course -1		2	0	0	1
Total number of Credits						**21**

III Year 2nd Semester

S. No.	Category	Course Title	L	T	P	Credits
1	H&S	Managerial Economics and Financial Analysis	3	0	0	3
2	PC-13	Compiler Design	3	0	0	3
3	PC-14	Data ware Housing & Data Mining	3	0	0	3
4	PC-15	Information Security	3	0	0	3
5	PE -2	Principles of Programming Languages Object Oriented Analysis & Design Computer Graphics	3	0	0	3
6	PE -3	Artificial Intelligence Software Testing Methodologies Advanced Databases	3	0	0	3
7	PC Lab	Data mining & Case Tools Lab	0	0	2	1
8	H & S	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -1		2	0	0	1
Total number of Credits						**21**

IV Year 1st Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-16	Mobile Application Development	3	0	0	3
2	PC-17	Cloud Computing	3	0	0	3
3	PE -4	Big Data Analytics Internet of Things R Programming	3	0	0	3
4	PE-5	Distributed Systems Mobile Computing Semantic Web & Social Networks	3	0	0	3
5	PE-6	Machine Learning E- Commerce Cyber Forensics	3	0	0	3
6	PC Lab	Mobile Application Development Lab	0	0	2	1
7	PE-4 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab	0	0	2	1
8	PW	Mini Project	0	0	0	3
Total number of Credits						20

IV Year IInd Semester

S. No.	Category	Course Title	L	T	P	Credits
1	OE-2		3	0	0	3
2	OE-3		3	0	0	3
3	PW	Technical Seminar	0	0	0	2
4	PW	Comprehensive Viva Voce	0	0	0	2
5	PW	Major Project	0	0	0	10
Total number of Credits						20

II Year B.Tech. CSE - I Sem

L	T	P	C
3	0	0	3

DATA STRUCTURES

Course Outcomes:

At the end of the course student would be able to

1. Analyze the representation of various static, dynamic and hierarchical data structures.
2. Design and implement the mechanism of stacks, general tree data structures with their applications.
3. Implementation of various advanced concepts of binary trees with real time applications.
4. Implement various algorithms on graph data structures, including finding the minimum spanning tree , shortest path with real time applications etc
5. Outline the concepts of hashing, collision and its resolution methods using hash function.

UNIT -- I:

Data Structures: Introduction, Types of data structures, Static and Dynamic representation of data structure and comparison. **Stacks:** Stacks definition, operations on stacks, Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack, **Queues:** types of Queues- Circular Queue, Deque and operations.

UNIT -- II:

Trees: Basic terminologies, Types of Binary Tree: Complete and Full Binary Tree, Extended Binary Trees, Threaded Binary Trees and In order Threading, Representation of Trees using Arrays and Linked lists (advantages and disadvantages). Tree Traversal and Representation of Algebraic expressions; Algorithms for Tree Traversals.

UNIT -- III:

Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Algorithm for Inserting, deleting and searching in BST. Representation and advantages of AVL Trees, algorithms on AVL Trees-Insertion, Rotation and Deletion. M-way trees with examples, Definition and advantages of B-trees, B+ Trees, Red-Black Trees.

UNIT -- IV:

Graphs-Basic terminology, Representation of graphs: sequential representation (Adjacency, Path Matrix) Linked representation. Graph Traversals-Breadth First Search, Depth First Search with algorithms. Definition and properties of Spanning Tree, Minimum Spanning Trees- Prims Algorithm, Kruskals Algorithm, Dijkstra Algorithms.

UNIT -- V:

Hashing: General Idea, Hash Functions, collisions, Collision avoidance techniques, Separate Chaining ,Open Addressing-Linear probing, Quadratic Probing, Double Hashing, Rehashing, Extensible Hashing, Implementation of Dictionaries

Text Books:

1. Data Structures Using C, Second Edition Reema Thereja OXFORD higher Education
2. Data Structures, A Pseudo code Approach with C, Richard F.Gillberg & Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition, 2005.

Reference Books:

1. Data Structures, Seymour Lipschutz, Schaum's Outlines, Tata McGraw-Hill, Special Second Edition.
2. Data Structures Using C and C++I, Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, Delhi India.
3. Fundamentals of Data StructuresI, Horowitz and Sahani, *Galgotia Publications* Pvt Ltd Delhi India.
4. Data Structure Using C, A.K. Sharma, Pearson Education India.

II Year B.Tech. CSE - I Sem

L	T	P	C
3	0	0	3

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Course Outcomes:

At the end of the course student would be able to

1. Analyze elementary mathematical arguments and identify fallacious reasoning.
2. Apply discrete mathematics problems that involve: computing permutations and combinations of a set.
3. Analyze and deduce problems involving recurrence relations and generating functions.
4. Perform operations on discrete structures such as sets, functions, relations, and sequences.
5. Apply graph theory models to solve the problems of networks.

UNIT -- I:

Foundations: Basics, Sets, Statements, Connectives, Normal Forms, Fundamentals of Logic, Logical Inferences, First order logic and other methods of Proof, Rules of Inference for Quantified Propositions, Automatic Theorem Proving.

UNIT – II:

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumerating Combinations and Permutations with & without repetitions, constrained repetitions, Pigeon hole principle, Inclusion-Exclusion principle.

UNIT -- III:

Recurrence Relations: Generating Functions, Calculating coefficient of Generating Function, Solving Recurrence relations by substitution method and Generating Functions, The Method of Characteristic Roots, Solutions to inhomogeneous recurrence relations, Binomial Theorem.

UNIT -- IV:

Relations and Digraphs: Relations and Directed Graphs, Special Properties of Binary Relations, Equivalence Relations, Ordering Relations, Lattice, Paths and Closures, Directed Graphs and adjacency matrices, Topological Sorting.

UNIT -- V:

Graphs - Basic Concepts, Isomorphism and Sub-graphs, Trees and Their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

Text Books:

1. Discrete Mathematics for Computer Scientists and Mathematicians by Joe L. Mott,Abraham Kandel, TheodareP.Baker, Second Edition, PHI, 2009.
2. Discrete Mathematical Structures with Applications to Computer Science, Tremblay J P and Manohar R, Tata McGraw Hill Publishing Company Limited, New Delhi, 2007.

Reference Books:

1. Discrete Mathematics R.K.Bisht, H.S.Dhami, OXFORD Higher Education.
2. Discrete Mathematics and its Applicationsl, Kenneth H Rosen, Tata McGraw Hill Publishing Company Limited, New Delhi, Sixth Edition, 2007.

II Year B.Tech. CSE - I Sem

L	T	P	C
3	0	0	3

PYTHON PROGRAMMING

Course Outcomes:

At the end of the course student would be able to

1. Identify the differences between scripts and programs
2. Solve the problems based on decision control statements
3. Develop programs on functions and data structures.
4. Write the programs on string operations
5. Use the object oriented techniques for solving real time problems

Unit – I

Introduction to Python:
Features of Python Language, Data Types, Operators, Expressions, Control Statement, Standard I/O Operations.

Functions and Modules:
Declaration and Definition Function Calling, More on Defining Functions, Recursive Functions, Modules, Packages in Python, Doc Strings, Built-in Functions.

Unit – II

Strings and Regular Expressions:
String Operations, Built-in String Methods and Functions, Comparing Strings, function in Regular Expression.
Sequence: List, Tuples, Dictionaries.

Unit – III

Introduction to Object Oriented Programming:

Features of Object Oriented Programming , Classes and Objects, Class Method and Self Argument. The __Init__Method, Class Variables and Object Variables, The _Del__Method, Public and Private Data Members, Private Methods, Buil-in Functions to Check, Get, Set and Delete Class Attributes, Garbage Collection(Destroying Objects).

Unit – IV
Inheritance:
Inheriting Classes in Python: Types of Inheritance; Composition/ Containership, Abstract Classes and Interfaces, Meta class.

Operator Overloading:
Introduction, Implementing Operator Overloading, Overriding Methods.

Unit – V
File Handling
Introduction, Types of Files, Reading and Writing Files, File Positions, Renaming and Deleting Files, Listing files of directory.

Exception Handling:
Introduction, Handling Exception, Multiple Except Blocks and Multiple Exceptions, Finally Block.
Case Study: Data Science.

Text Books

1. "Reema Thareja", Python Programming using Problem Solving Approach, First Edition, Oxford Higher Education.
2. James Payne, Beginning Python using Python 2.6 and Python 3

Reference Books

1. Kenneth A.Lambert, Fundamentals of Python
2. Charles Dierach, Introduction to Computer Science using Python

II Year B.Tech. CSE - I Sem

L	T	P	C
0	0	2	1

DATA STRUCTURES & PYTHON PROGRAMMING LAB

Course Outcomes:

At the end of the course student would be able to

1. Develop the programs on stacks, trees and its applications.
2. Design and implementation of programs on BST and Graph Traversals.
3. Use various Control statements, string manipulations and to Perform list and dictionaries operations in python

Part-A

1. C Programs to illustrate concepts of arrays, structures, unions and enumerated data types.
2. Program to convert infix to postfix notation
3. Program to evaluate postfix notations
4. Program to illustrate tree traversals
   a) In order b) Pre order c) Post order
5. Program to illustrate insertion, deletion and searching in Binary Search Tree.
6. Program to illustrate Insertion, deletion and Rotation on AVL Trees.
7. Program to illustrate Graph traversals
   a) Breadth First Search
   b) Depth First Search
8. Program to implement hash table using linear and quadratic probing.

Part- B

Exercise 1

a) Installation and Environment setup of python.

b) Write a program to demonstrate the use of basic Data Types

c) Write a program to demonstrate the Operators and Expressions

d) Write a program to demonstrate the Functions and parameter passing Techniques.

Exercise 2

a) Write a Program to implement

i. Packages ii. Modules iii. Built-in Functions

b) Write a Program to implement

i. List ii. Tuple iii. Dictionaries

c) Programs on Stings, String Operations and Regular Expressions

Exercise 3

a) Write a Program to implement Class and Object

b) Write a Program to implement Static and Instance methods, Abstract Classes and Interfaces.

Exercise 4

a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)

b) Write a program to convert a given decimal number to other base systems

Exercise 5

a) Write a program to implement Inheritance

b) Write a program to implement Polymorphism

Exercise 6

a) Write a program to implement Files

b) Write a program to Exception Handling.

II Year B.Tech. CSE - II Sem

L	T	P	C
3	1	0	4

DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcomes:

At the end of the course student would be able to

1. Acquire the knowledge of algorithm analysis and its notations that are applied on the problems solved by divide and conquer paradigm.
2. Apply the major graph algorithms for model engineering problems and knowledge of the greedy paradigm
3. Apply the dynamic-programming paradigm and recite algorithms that employ this paradigm.
4. Apply the concept of back tracking, branch and bound paradigm for real time problems.
5. Analyze the complexity of problems and differentiate that in terms of P and NP problems with examples.

UNIT I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Disjoint Sets- disjoint set operations, union and find operations.

Divide and conquer: General method, applications - Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT II

Graphs: Breadth First Search, Depth First Search, spanning trees, connected and bi-connected components

Greedy method: General method, Applications- Optimal storage on Tapes, Job sequencing with deadlines, knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT III

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph colouring, Hamiltonian cycles.

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

UNIT V:

Lower Bound Theory: Comparison Trees, NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP Complete classes, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharan, Galgotia publications Pvt. Ltd.
2. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

References:

1. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGraw Hill.
2. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.

II Year B.Tech. CSE - II Sem

L	T	P	C
3	0	0	3

COMPUTER ORGANIZATION

Course outcomes:

At the end of the course student would be able to

1. Understand the basic organization of computer and different instruction formats and addressing modes.
2. Outline the concepts of 8086 microprocessor and arithmetic operations.
3. Make use of micro processor instructions to write simple programs in assembly language.
4. Classify various modes of data transfers.
5. Outline various inter connection structures of multi processors.

UNIT -- I:

Introduction to computer organization- Digital Computers, Instruction codes, stored program organization, computer registers, computer instructions , instruction cycle, types of instruction formats (Zero, one, two and three address), RISC instructions.

Addressing modes: mode field, implied, immediate register, register direct, register indirect, auto increment, decrement, indexed, relative, base address mode, Numerical examples and problems.

UNIT -- II:

CPU-Organization: 8086 – CPU – Block diagram and pin diagram, concept of pipelining, minimum and maximum mode, segment register and generation of 20 bit address, concept of address, data, control and systems bus, Types of flags.

UNIT -- III:

CPU and Main Memory interface- Programming the basic computer – Machine Assembly Languages. **Assembler:** basic assembly language instructions (ADD, SUB, LOAD, STORE, MOV, CMP, JUMP). **Micro-programmed control:** control memory, address sequencing, micro program example and design of control unit.

UNIT -- IV:

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus. **Modes of Transfer:** Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy- Chaining priority.

DMA: DMA Controller, DMA Transfer, Intel 8089 IOP.

UNIT -- V:

Multi Processors: Characteristics of Multi Processor; **Interconnection structures:** Time shared common bus, multiport memory, crossbar switch, multi-stage switching network;

Introduction to Flynn's classification: SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

1. Computer System Architecture – M. Morris Mano, Third Edition, Pearson/PHI, 2011.
2. Microprocessor and Interfacing – Douglas V Hall, Second Edition, TATA McGraw Hill, 2006.

Reference Books:

1. Computer Organization – Carl Hamacher, ZvonksVranesic, SafeaZaky, V Edition,McGraw Hill.
2. Computer Organization and Architecture – William Stallings, 6th Edn,Pearson/PHI.

II Year B.Tech. CSE - II Sem

L	T	P	C
3	0	0	3

JAVA PROGRAMMING

Course Outcomes:

At the end of the course student would be able to

1. Understand the Object Oriented Programming concepts.
2. Apply the concepts of package and interfaces.
3. Apply the concepts of Exceptions and multithreading.
4. Analyze GUI applications and AWT using Frames.
5. Design the programs using Applet and JDBC Concepts.

UNIT -- I:

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

Fundamentals of Object Oriented Programming: Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming, Applications of OOP. Concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, static keyword, nested and inner classes, Strings, Object class.

UNIT -- II:

Inheritance & Polymorphism: Introduction, Forms of Inheritance - specialization, specification, construction, extension, limitation, combination, Member access rules, super keyword, polymorphism- method overriding, abstract classes, final keyword.

Interfaces and Packages: Introduction to Interfaces, differences between abstract classes and interfaces, multiple inheritance through interfaces, Creating and accessing a package, Understanding CLASSPATH, importing packages.

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

UNIT -- III:

Files: Introduction to I/O Streams: Byte Streams, Character Streams. File I/O.

Multi threading: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

Java.util package- Collection Interfaces: List, Map, Set. The Collection classes: LinkedList, HashMap, TreeSet, StringTokenizer, Date, Random, Scanner.

UNIT -- IV:

AWT: Class hierarchy, Component, Container, Panel, Window, Frame, Graphics.

AWT controls: Labels, Button, Scrollbar, Text Components, Checkbox, CheckboxGroup, Choice, List, Panes – ScrollPane, Dialog and MenuBar.

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

UNIT -- V:

Layout Manager – Border, Grid, Flow, Card and Gridbag.

Applets – Concepts of Applets, differences between applets and applications, life cycle of an apple, create applets, passing parameters to applets.

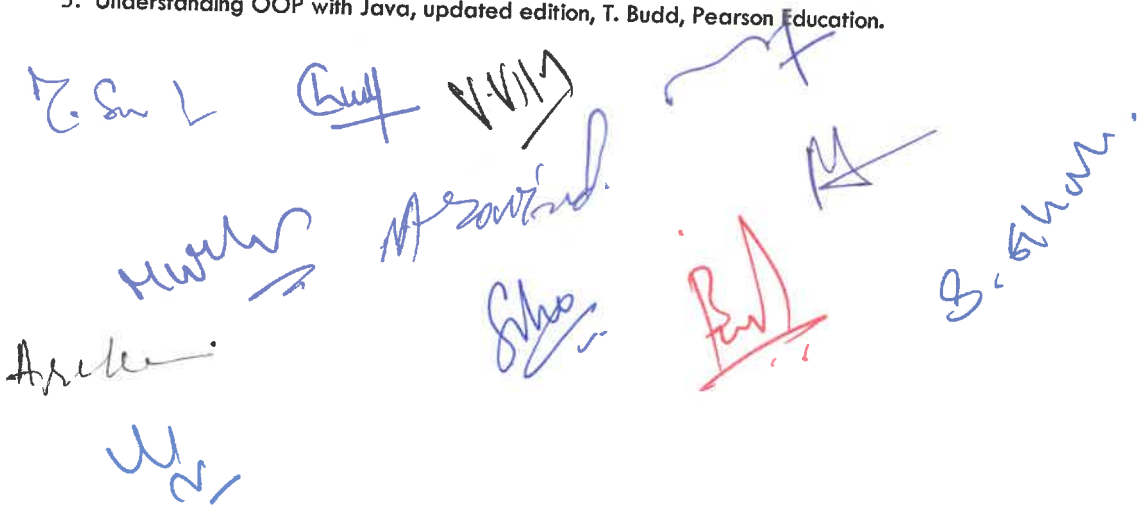
JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

1. Java- the complete reference, Seventh edition, Herbert Schildt, Tata McGraw Hill.
2. Database Programming with JDBC & JAVA, Second Edition, George Reese, O'Reilly Media.
3. Programming in JAVA, Second Edition, OXFORD Higher Education.

Reference Books:

1. Thinking in Java Fourth Edition, Bruce Eckel
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.



II Year B.Tech. CSE - II Sem

L	T	P	C
3	0	0	3

SOFTWARE ENGINEERING

Course Outcomes:

At the end of the course student would be able to

1. Outline the framework activities for a given project.
2. Apply Right process model for a given project.
3. Design various system models for a given Context.
4. Apply various testing techniques for a given project.
5. Identify various risks in project development.

UNIT I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), personal and team process models.

UNIT II:

Process Models: The waterfall model, Incremental process models, Evolutionary process model, Agile process model.

Software Requirements: Functional and non-functional requirements, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT III:

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

Design Engineering: Design process and Design quality, Design concepts, the design model, Modeling component level design: design class based components, conducting component level design.

User interface design: Golden rules.

UNIT IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing.

Product Metrics: Software Quality, Metrics for Analysis Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for maintenance.

UNIT V:

Risk Management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

References:

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, JohnWiely.
3. Systems Analysis and Design- ShelyCashmanRosenblatt,Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

II Year B.Tech. CSE - II Sem

L	T	P	C
3	0	0	3

DATABASE MANGEMENT SYSTEMS

Course Outcomes:

At the end of the course student would be able to

1. Design Entity-Relationship Model for enterprise level databases.
2. Develop the database and provide restricted access to different users of database and formulate the Complex SQL queries.
3. Analyze various Relational Formal Query Languages and various Normal forms to carry out Schema refinement
4. Able to apply suitable indexing and hashing mechanisms and embed transaction concepts.
5. Ability to analyze various concurrency control protocols and working principles of recovery algorithms.

UNIT-I

Introduction to Database System Concepts: Database-System Applications, Purpose of Database Systems, View, Database Language, Database Architecture, Database Users and Administrators.

Introduction to the Relation Models and Database Design using ER Model: Overview of the Design Process, The Entity-Relationship Model, Constraints, Entity-Relationship Diagrams, Reduction to Relational Schemas, Entity-Relationship Design Issues, Extended E-R Feature, Structure of relational databases , database schema , keys, schema diagrams.

UNIT-II

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions Nested Sub queries, Modification of the Database.
Intermediate and Advanced SQL: Join Expressions, Views , Integrity Constraints, SQL Data Types, Authorization. Functions and Procedures, Triggers, Advanced Aggregation Features.

UNIT-III

Formal Relational Query Languages: The Relational operations, The Tuple Relational Calculus, The Domain Relational Calculus.

Relational Database Design: Features of Good Relational Designs, Atomic Domains and First Normal Form, Decomposition Using Functional Dependencies, Decomposition Using Multi valued Dependencies, More Normal Forms.

UNIT-IV

Indexing and Hashing: Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.
Transactions: Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity, Transaction Isolation Levels.

UNIT-V

Concurrency Control: Lock-Based Protocols, Deadlock Handling, Multiple Granularity, Timestamp- Based Protocols, Validation-Based Protocols, Multi version schemes.
Recovery System: Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan,Database System Conceptsl, 6th Edition, Tata McGraw-Hill.
2. Raghu Rama Kirshna, Johannes Gehrk, —Database Management Systeml Tata McGraw Hill 3rd Edition.

Reference Books:

1. Peter Rob & Carlos Coronel —Database System Concepts Cengage Learning.
2. RamezElmasri, Shamkanth B. Navrate – Fundamentals of Database Systems – 7th Edition, Pearson Education.
3. C.J. Date —Introduction to Database Systems Pearson Education

II Year B.Tech. CSE - II Sem

L	T	P	C
0	0	2	1

JAVA PROGRAMMING LAB

Course Outcomes:

At the end of the course student would be able to

1. Develop programs on various concepts like data abstraction & data hiding, encapsulation, inheritance, polymorphism.
2. Create and use I/O Streams, threads and handle exceptions.
3. Design GUI applications using applets and JDBC.

Week 1 & 2:

1. Write a program to find total, average of given two numbers by using function with command-line arguments, static data members.
2. Write a program to illustrate class and objects.
3. Write a program to illustrate method & constructor overloading.
4. Write a program to illustrate parameter passing using objects.
5. Write a program to illustrate Array Manipulation.

Week 3:

6. Write a program to illustrate different types of inheritances.
7. Write a java program to illustrate Method Overriding.
8. Write a java program to demonstrate the concept of polymorphism (Dynamic Method Dispatch).
9. Write a program to demonstrate final keyword.

Week 4 & 5:

10. Write a program to illustrate the use of creation of packages.
11. Write a java program to handle the situation of exception handling using multiple catch blocks.
12. Write a program to implement the concept of User defined Exceptions.

Week 6 & 7:

13. Write a program to illustrate Multithreading and Multitasking.
14. Write a program to illustrate thread priorities.
15. Write a program to illustrate Synchronization

Week 8 & 9:

16. Write a program to implement StringTokenizer.
17. Write a program to read one line at a time, and write it to another file.

Week 10 & 11:

18. Write a program to illustrate Event Handling (keyboard, Mouse events)
19. Write a program to illustrate applet life cycle and parameter passing.

Week 12:

20. Write a program to develop a calculator application using AWT.

Week 13:

21. Write a program to illustrate JDBC.

II Year B.Tech. CSE - II Sem

L	T	P	C
0	0	2	1

DATABASE MANAGEMENT SYSTEMS LAB

Course Outcomes:

At the end of the course student would be able to

1. Use the SQL commands such as DDL, DML, DCL, TCL to create, manipulate, access data from database objects and providing authorization to access database by different users.
2. To apply various integrity Constraints on the database tables for preserving the integrity of the database.
3. Design and implement PI/SQL programs which includes procedures, functions, cursor and triggers.

1. Database Schema for a customer-sale scenario

Customer(**Cust id : integer**, cust_name: string)
Item(**item_id: integer**,item_name: string, price: integer)
Sale(**bill_no: integer**, bill_data: date, **cust_id: integer, item_id: integer**, qty sold: integer)
For the above schema, perform the following—

a. Create the tables with the appropriate integrity constraints
b. Insert around 10 records in each of the tables
c. List all the bills for the current date with the customer names and item numbers
d. List the total Bill details with the quantity sold, price of the item and the final amount
e. List the details of the customer who have bought a product which has a price>200
f. Give a count of how many products have been bought by each customer
g. Give a list of products bought by a customer having cust_id as 5
h. List the item details which are sold as of today
i. Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold, amount
Create a view which lists the daily sales date wise for the last one week

2. Database Schema for a Student Library scenario

Student(**Stud_no : integer**,Stud_name: string)
Membership(**Mem_no: integer**,**Stud_no: integer**)
Book(**book_no: integer**, book_name:string, author: string)
Iss_rec(**iss_no:integer**, iss_date: date, **Mem_no: integer, book_no: integer**)
For the above schema, perform the following

a. Create the tables with the appropriate integrity constraints
b. Insert around 10 records in each of the tables
c. List all the student names with their membership numbers
d. List all the issues for the current date with student and Book names
e. List the details of students who borrowed book whose author is CJDATE
f. Give a count of how many books have been bought by each student
g. Give a list of books taken by student with stud_no as 5
h. List the book details which are issued as of today
i. Create a view which lists out the iss_no, iss _date, stud_name, book name
j. Create a view which lists the daily issues-date wise for the last one week

3. Database Schema for a Employee-pay scenario

employee(**emp_id:**integer,emp_name:string)
department(**dept_id:integer**,dept_name:string)
paydetails(**emp_id : integer,dept_id: integer**, basic: integer, deductions: integer, additions: integer, DOJ: date)
payroll(**emp_id : integer**, pay_date: date)
For the above schema, perform the following

a. Create the tables with the appropriate integrity constraints
b. Insert around 10 records in each of the tables
c. List the employee details department wise
d. List all the employee names who joined after particular date

e. List the details of employees whose basic salary is between 10,000 and 20,000
f. Give a count of how many employees are working in each department
g. Give a names of the employees whose netsalary>10,000
h. List the details for an employee_id=5
i. Create a view which lists out the emp_name, department, basic, dedeuctions, netsalary
j. Create a view which lists the emp_name and his netsalary

4. Database Schema for a Video Library scenario

Customer(**cust_no: integer**, cust_name: string)
Membership(**Mem_no: integer, cust_no: integer**)
Cassette(**cass_no:integer**, cass_name:string, Language: String)
Iss_rec(**iss_no: integer**, iss_date: date, **mem_no: integer, cass_no: integer**)
For the above schema, perform the following

a. Create the tables with the appropriate integrity constraints
b. Insert around 10 records in each of the tables
c. List all the customer names with their membership numbers
d. List all the issues for the current date with the customer names and cassette names
e. List the details of the customer who has borrowed the cassette whose title is — The Legendl
f. Give a count of how many cassettes have been borrowed by each customer
g. Give a list of book which has been taken by the student with mem_no as 5
h. List the cassettes issues for today
i. Create a view which lists outs the iss_no, iss_date, cust_name, cass_name
j. Create a view which lists issues-date wise for the last one week

5. Database Schema for a student-Lab scenario

Student(**stud_no: integer**, stud_name: string, **class: string**)
Class(**class: string,descrip: string**)
Lab(**mach_no: integer**, Lab no: integer, description: String)
Allotment(**Stud_no: Integer, mach_no: integer, day of week: string**)
For the above schema, perform the following

a. Create the tables with the appropriate integrity constraints
b. Insert around 10 records in each of the tables
c. List all the machine allotments with the student names, lab and machine numbers
d. List the total number of lab allotments day wise
e. Give a count of how many machines have been allocated to the 'IT' class
f. Give a machine allotment details of the stud_no 5 with his personal and class details
g. Count for how many machines have been allocated in **Lab_no 1** for the day of the week as –Mondayl
h. How many students class wise have allocated machines in the labs
i. Create a view which lists out the stud_no, stud_name, mach_no, lab_no, dayofweek
j. Create a view which lists the machine allotment details for –Thursdayl.

6. **Create a cursor, which displays all employee numbers and names from the EMP table.**
7. **Create a cursor, which update the salaries of all employees as per the given data.**
8. **Create a cursor, which displays names of employees having salary > 50000.**
9. **Create a procedure to find reverse of a given number**
10. **Create a procedure to update the salaries of all employees as per the given data**
11. **Create a procedure to demonstrate IN, OUT and INOUT parameters**
12. **Create a function to check whether given string is palindrome or not.**
13. **Create a function to find sum of salaries of all employees working in depart number 10.**
14. **Create a trigger before/after update on employee table for each row/statement.**
15. **Create a trigger before/after delete on employee table for each row/statement.**
16. **Create a trigger before/after insert on employee table for each row/statement.**

III Year B.Tech. CSE – I Sem

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COMPUTER NETWORKS

Course Outcomes:
At the end of the course, student will be able to:

1. Understand the overview of reference models.
2. Classify and illustrate various sub protocols in multi access protocols.
3. Understand various routing algorithms and their operations.
4. Classify IP protocol schemes.
5. Recommend transport protocol for the given scenarios.

UNIT - I:

Overview of the Internet: Definition of networks, Topology, Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.

Physical Layer: Guided transmission media, wireless transmission media.

Data Link Layer - Design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol.

UNIT - II:

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer – CSMA/CD with Binary Exponential Backoff, Ethernet Performance, Switched, Fast, Gigabit, 10-Gigabit Ethernets, Data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control

UNIT - IV:

Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT - V:

The Internet Transport Protocols: UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols-Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP

Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. An Engineering Approach To Computer Networks-S.Keshav ,2nd Edition ,Pearson Education.
2. Understanding Communications And Networks,3rd Edition,W.A .Shay,Cengage Learning.
3. Introduction To Computer Networks And Cyber Security ,Chwan-Hwa(John)Wu,J.David Irwin, CRC Press.
4. Computer Networking :Atop Down Approach Featuring The Internet, James F.Kurose,K.W.Ross,3rd Edition, Pearson Education.

III Year B.Tech. CSE – I Sem

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OPERATING SYSTEMS

Course Outcomes:
At the end of the course, student will be able to:

1. Understand the basic functions of Operating systems and system calls.
2. Analyze process scheduling and synchronization.
3. Understand the concepts of memory management.
4. Examine the concepts of MASS storage structure
5. Compare different protection methods of OS and understand the deadlock concepts.

UNIT - I:

Operating System Introduction: Operating Systems Objectives and functions, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special - Purpose Systems, Operating System services, user OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, Virtual Machines.

UNIT - II:

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switching, Preemptive Scheduling, Scheduling Criteria, Scheduling algorithms, Thread scheduling, Case studies: Linux, Windows.
Process Coordination - Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT - III:

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms, Thrashing.

UNIT - IV:

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.
Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management.

UNIT - V:

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery.
Protection - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH

III Year B.Tech. CSE – I Sem

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WEB TECHNOLOGIES

Course Outcomes:

At the end of the course, student will be able to:

1. Develop static and dynamic web pages using HTML and javascript.
2. Understand the XML tags and to parse XML data with java.
3. Develop web applications using server side programming with PHP.
4. Implement web applications using JDBC and Servlets.
5. Apply web applications with JSP.

UNIT –I

Introduction to HTML: HTML tags, Lists, Tables, Images, Forms, Frames, Cascading Style Sheets
Client Side Scripting: Java Script Language – Declaring variables, Scope of variables, Functions, Objects in java scripts, Dynamic HTML with java scripts, Form Validation.

UNIT –II

XML: Introduction to XML, Defining XML tags their attributes and values, Document Type Definition, XML Schema, Document Object Model, and XHTML.
Parsing XML Data: DOM and SAX Parsers in java.
AJAX A New approach: Introduction to Ajax, Simple Ajax Application

UNIT –III

Introduction to PHP:
Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc. Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.
File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files listing directories.

UNIT –IV

Introduction to Servlets: Common Gateway Interface (CGI), The Servlet API, Life cycle of a Servlet, Deploying a Servlet, Reading Servlet parameters, Reading Initialization parameters, Handling HTTP Request &Responses,Using Cookies and Sessions,
Introduction to JDBC: JDBC Drivers, JDBC Process, Connecting to a Database using JDBC

UNIT –V

Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, Implicit Objects, Using Beans in JSP Pages, Using Cookies and Session for Session Tracking, Connecting to Database using JSP. **Introduction to MVC Architecture.**

TEXT BOOKS

1. Programming the World Wide Web (7th Edition)7th Edition by Robert W. Sebesta
2. Web Technologies Uttam K Roy, Oxford University Press
3. The Complete Reference PHP – **Steven Holzner** , Tata McGraw-Hill

REFERENCE BOOKS

1. Web Programming, Building Internet Applications , Chris Bates 2nd edition , Wiley Dreamtech
2. Java Script , D Flanagan, O'Reilly,SPD
3. Java Server Pages- Hans Bergsten , SPD O'Reilly

III Year B.Tech. CSE – I Sem

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FORMAL LANGUAGES AND AUTOMATA THEORY

Course Outcomes:

At the end of the course, students will be able to

1. Construct finite state diagrams for solving problems of computer science
2. Analyze Regular expressions for finite automata
3. Find solutions to the problems using context free grammars
4. Design Turing machines for unrestricted grammars
5. Analyze Chomsky hierarchy

UNIT-I

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers. Finite Automata: NFA with e transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without e-transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Introduction to Finite Automata with output.

UNIT-II

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets (proofs not required), closure properties of regular sets (proofs not required) Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion. Context free grammar, derivation trees, and sentential forms. Rightmost and leftmost derivation of strings.

UNIT-III

Context Free Grammars: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration properties of CFL (proofs omitted).Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA

UNIT-IV

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required). Linear bounded automata and context sensitive language.

UNIT-V

Computability Theory: Chomsky hierarchy of languages, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility. Definition of P and NP problems, NP complete and NP hard problems

TEXT BOOKS :

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education. 2
2. Introduction to Theory of Computation –Sipser 2nd edition Thomson.

REFERENCE BOOKS :

1. Introduction to Formal languages Automata Theory and Computation Kamala Krithivasan Rama .
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley. 3. Theory Of Computation: A
3. Problem-Solving Approach, Kavi Mahesh, Wiley India Pvt. L
4. Theory Of Computation: A Problem-Solving Approach, Kavi Mahesh, Wiley India Pvt. Ltd.
5. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson

III Year B.Tech. CSE – I Sem

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HUMAN COMPUTER INTERACTION
(Professional Elective-1)

Course Outcomes:
At the end of the course, students will be able to

1. Explain the capabilities of both humans and computers from the viewpoint of human information processing.
2. Describe and use HCI design principles, standards and guidelines.
3. Analyze and identify user models, user support, socio-organizational issues, and stakeholder requirements of HCI systems.
4. Discuss about different mobile applications and related design issues.
5. Analyze and discuss HCI issues in virtual reality, multimedia, and Word Wide Web-related environments.

UNIT I

FOUNDATIONS OF HCI: The Human- I/O channels, Human Memory, Thinking: Reasoning and problem solving; **The computer-**Display Devices, Memory, processing and networks; **The Interaction-** Models of interaction, frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface, Interactivity.

UNIT II

DESIGN PROCESS: Interaction Design basics – The process of design, Scenarios, Navigation design, Screen Design and layout, Iteration and prototyping; **HCI in software process** – software life cycle, Usability engineering, Prototyping in practice, Design rationale; **Design rules** – Principles to support usability, Standards, guidelines Golden rules and heuristics; **Evaluation Techniques.**

UNIT III

MODELS AND THEORIES: Cognitive models, Socio-Organizational issues and stake holder requirements, Communication and collaboration models.

UNIT IV:

MOBILE HCI: Mobile Ecosystem-Platforms, Application frameworks; **Types of Mobile Applications:** Widgets, Applications, Games; Mobile Information Architecture; **Mobile Design:** Elements of Mobile Design, Tools; **Mobile 2.0.**

UNIT V

WEB INTERFACE DESIGN: Drag & Drop, Overlays, Inlays and Virtual Pages, Process Flow.

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004 (UNIT I , II & III).
2. Brian Fling, "Mobile Design and Development", First Edition , O'Reilly Media Inc., 2009 (UNIT –IV).
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009.(UNIT-V).

REFERENCE BOOKS

1. The essential guide to user interface design, Wilbert 0 Galitz, Wiley DreamTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
3. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

III Year B.Tech. CSE – I Sem

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LINUX PROGRAMMING
(Professional Elective-1)

Course Outcomes:
At the end of the course, student will be able to:

1. Understand and make effective use of Linux file handling utilities.
2. Solve problems using shell scripting language (bash).
3. Develop the skills necessary for systems programming.
4. Examine various operations involved in process and signal management.
5. Distinguish intra and inter process communication.

UNIT - I:

Linux Utilities: File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.
Sed-Scripts, Operations, Addresses, Commands, Applications, awk-Execution, Fields and Records, scripts, operations, patterns, actions, functions, using system commands in awk.

UNIT - II:

Shell programming with Bourne again shell(bash): Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing functions, debugging shell scripts.

UNIT - III:

Files : File Concept, File types, File System Structure, Inodes, File Attributes, Library Functions, kernel support for files, system calls for file I/O operations- open, create, read, write, close.
Directories: Creating, removing and changing Directories -mkdir, rmdir, chdir, obtaining current working directory. Scanning Directories-opendir, readdir, closedir, rewinddir functions.

UNIT - IV:

Process: Process Concept, process identification, process control - process creation, waiting for a process, process termination, Kernel support for process, zombie process, orphan process, Process APIs.
Signals - Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT - V:

Inter Process Communication: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs- creation, IPC between unrelated processes using FIFOs (Named pipes), differences between unnamed and named pipes, open and close library functions.
Sockets: Introduction to Sockets, Socket address structures, Socket system calls for connection oriented protocol and connectionless protocol.

TEXT BOOKS:

1. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
2. Unix and Shell Programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.
3. Unix Network Programming, W. R. Stevens, PHI.

REFERENCE BOOKS:

1. Unix System Programming using C++, T. Chan, PHI.
2. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.
3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
4. Unix shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.
5. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.

C Programming Language, Kernighan and Ritchie, PHI

III Year B.Tech. CSE – I Sem

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SOFTWARE PROJECT MANAGEMENT
(Professional Elective-1)

Course Outcomes:
At the end of the course, student will be able to:

1. Compare and contrast the various CSM models.
2. Understand the principle of software engineering.
3. Examine the lifecycle phases, artifacts of the process and model based software architectures.
4. Compare various work flow process models.
5. Evaluate different software product metrics.

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance. Evolution of Software Economics: Software Economics, pragmatic software cost estimation.

UNIT II

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.
The old way and the new: The principles of conventional software engineering, principles of modern software management, transitioning to an iterative process.

UNIT III

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.
Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.
Model based software architectures: A Management perspective and technical perspective.

UNIT IV

Work Flows of the process: Software process workflows, Inter trans workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction planning process, Pragmatic planning. Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.
Process Automation: Automation Building Blocks, the Project Environment.

UNIT V

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Example: Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.
Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R)

TEXT BOOKS:

1. Software Project Management, Walker Royce, Pearson Education, 1998

REFERENCE BOOKS:

1. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition,Tata Mc-Graw Hill,2006
2. Applied Software Project Management, Andrew Stellman& Jennifer Greene,O'Reilly,2006.
3. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly,2007. Software Engineering Project Managent, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.

III Year B.Tech. CSE – I Sem

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COMPUTER NETWORKS & OPERATING SYSTEMS LAB

Course Outcomes:

At the end of the course, student will be able to:

1. Implement various CPU scheduling algorithms
2. Apply the memory management techniques
3. Implement various algorithms for error detection and correction

Week 1: Simulate the following CPU Scheduling Algorithms using C program:

a) FCFS b) SJF

Week 2: Simulate the following CPU Scheduling Algorithms using C program:

c) Priority d) Round Robin

Week 3: Simulate Paging Technique of Memory Management using C program.

Week 4: Write a program to implement page replacement algorithms (FCFS, Optimal, and LRU).

Week 5: Write a C program to simulate the following file allocation strategies.

a) Sequential b) Indexed c) Linked

Week 6: Write a program to simulate disk scheduling algorithms

a)FCFS b) SCAN c)C-SCAN

Week 7: Write a program to implement Banker's algorithm for deadlock avoidance.

Week 8: Implement the data link layer farming methods such as character stuffing and bit stuffing.

Week 9: Implementation of Hamming code algorithm

Week 10: Implement on a data set of characters the three CRC polynomials – CRC 12, CRC and CCIP.

Week 11: Implement Dijkstra 's algorithm to compute the Shortest path through a graph.

Week 12: Take an example subnet of hosts. Obtain broadcast tree for it.

Week 13: Write a program for congestion control using leaky bucket algorithm.

III Year B.Tech. CSE – I Sem

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WEB TECHNOLOGIES LAB

Course Outcomes:
At the end of the course, student will be able to:

1. Design static web pages and provide client side authentication.
2. Understand database connectivity, XML data and retrieving data using client/server database.
3. Design dynamic web pages and develop web applications using MVC architecture.

List of Experiments

Week 1: Create a Registration page using HTML.

Week 2: Create a static HTML application with three frames as below:
First frame at the top containing a header
Second frame a navigation frame that contains hyperlinks to open 3 other pages
Third frame that displays a page corresponding to the hyperlinks in the second frame

Week 3: Design a static HTML page that contains a selection box with a list of 5 countries.
When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

Week 4: Design a HTML page with required Javascript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.

Week 5: Validate thefields of registration page created in the first experiment using regular expressions in Javascript.

Week 6: Validate an XML document using DTD and XML schema.

Week 7: Create an XML document that contains 10 users information. Write a Java program,which takes User Id as input and returns the user details by taking the user informationfrom the XML document using (a) DOM Parser and (b) SAX parser

Week 8: Create a user authentication web application using AJAX.

Week 9: Create a PHP application that reads request parameters from the registration page created in the first experiment and stores in the database.

Week 10: Create a PHP application program for authenticating users for the above program using sessions.

Week 11: Installation and configuration of Tomcat and deploy a simple "Hello World" servlet.

Week 12: Write a servlet that reads request parameters from the registration page created in the first experiment and stores in the database.

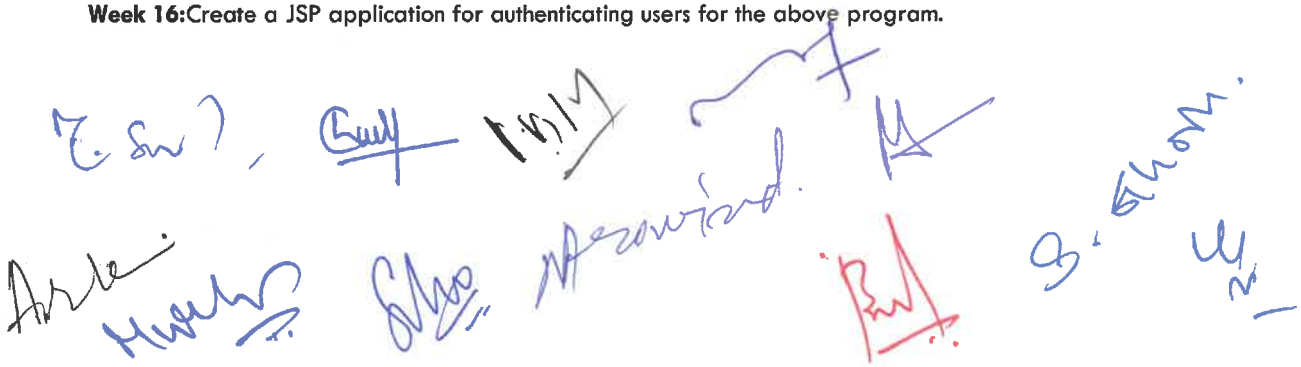
Week 13: Write a servlet program for authenticating users for the above program.

Week 14: Implement the following session handling techniques using servlets:

i) Cookies
ii) Hidden form field
iii) HttpSession
iv) URL Rewriting

Week 15: Create a JSP appplication that reads request parameters from the registration page created in the first experiment and stores in the database using Java Beans.

Week 16: Create a JSP application for authenticating users for the above program.



VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Part – C

Syllabi of

B.Tech III Year II Semester

III Year B.Tech. CSE – II Sem

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COMPILER DESIGN

COURSE OUTCOMES:
At the end of the course, student will be able to:

1. Differentiate the phases of compilation & parsing
2. Identify the process in parsing
3. Understand semantic analysis and symbol tables
4. Explain about code optimization techniques
5. Analyze data flow and generate object code

UNIT – I

Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

Top down Parsing: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT – II

Bottom up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator.

UNIT – III

Semantic analysis: Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT – IV

Code optimization: Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT – V

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

Text Books:

1. Principles of compiler design -A.V. Aho.J.D.Ullman; Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

References:

1. Compiler Construction -An Adavanced course –manish kumar jha, Dhanpat rai, Third completely revised Version
2. Lex & yacc– John R. Levine, Tony Mason, Doug Brown, O'reilly
3. Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech.

III Year B.Tech. CSE – II Sem

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DATA WAREHOUSING & DATA MINING

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the fundamentals of Data warehousing and OLAP technology.
2. Outline the Data Mining and Data pre-processing techniques.
3. Identify the frequent patterns using association algorithms.
4. Distinguish how classification algorithms are used on data sets.
5. Compare different clustering techniques on large data sets.

UNIT – I

Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data ware housing to data mining.

UNIT – II

Introduction to Data Mining: What motivated data mining? Why it is important? So- What is Data mining, Data Mining-On What Kind of Data, Data Mining Functionalities-What kind of patterns can be Mined, Are All of the patterns Interesting, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data warehouse system, Major issues in Data mining.

Data pre-processing:-Why Preprocess the Data, Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT – III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT – IV

Classification & Prediction: What is Classification? What is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back Propagation, Support Vector Machines, Associative Classification: Classification by Association Rule Analysis, Lazy Learners, Other Classification Methods, Prediction.

UNIT – V

Cluster Analysis: What is Cluster Analysis, Types of Data in Cluster Analysis,A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

Text Book:

1. Data Mining- Concepts and Techniques by Jiawei Han, Micheline Kamber and Jian Pei –Morgan Kaufmann publishers –--2nd edition
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education

References:

1. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
2. Data Warehousing in the Real World – Sam Aanhory& Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.
4. Data Warehousing Fundamentals – PaulrajPonnaiah Wiley student Edition

III Year B.Tech. CSE – II Sem

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INFORMATION SECURITY

Course Outcomes:
At the end of the course, student will be able to:

1. Identify various Security Attacks.
2. Understand various Encryption Principles and algorithms.
3. Implement Cryptography algorithms.
4. Understand various Security Associations and Key Management.
5. Design a Firewall for Security.

UNIT - I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT – II

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT – III

Public key cryptography principles; public key cryptography algorithms; digital signatures, digital Certificates; Certificate Authority and key management Kerberos, X.509; Directory Authentication Service; Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT – IV

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

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

UNIT - V.

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permeh, wiley Dreamtech.

REFERENCES:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press).
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson.
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH.
6. Introduction to Cryptography, Buchmann, Springer.

III Year B.Tech. CSE – II Sem

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PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective-2)

Course Outcomes:
At the end of the course, student will be able to:

1. Understand the importance of programming paradigms.
2. Illustrate the syntax and semantics in formal notation.
3. Make use of expressions and statements for subprograms and blocks.
4. Select different object oriented concepts for solving a given problem.
5. Compare the features of different programming languages.

UNIT I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments

UNIT II:

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotation semantics and axiomatic semantics for common programming language features.
Names, Bindings, Data types: Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types.

UNIT III:

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements and guarded commands.
Subprograms and Blocks: Fundamentals of sub-programs, Scope and life time of variables, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT IV:
Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95
Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.
Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V:
Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.
Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

1. Concepts of Programming Languages Robert.W. Sebesta , Tenth Edition, Pearson Education.

REFERENCE BOOKS:

1. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.
3. LISP Patric Henry Winston and Paul Horn Pearson Education.
4. Programming in Prolog, W. F. Clocksin& C. S. Mellish, 5th Edition, Springer.
5. Programming Python, M. Lutz, 3rd Edition, O'reilly, SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
7. Guide to Programming with Python, Michel Dawson, Thomson, 2008

III Year B.Tech. CSE – II Sem

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OBJECT ORIENTED ANALYSIS & DESIGN
(Professional Elective-2)

Course Outcomes:
At the end of the course, student will be able to:

1. Understand Object Oriented Software Development Process
2. Construct class and object diagrams for the given scenario
3. Model interaction diagrams, usecase diagrams and activity diagrams for a given project
4. Design State diagrams involving processes and threads
5. Apply Unified Modeling Language Construct for Developing Structural Design of an ATM Project.

UNIT– I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture and Software Development Life Cycle.

UNIT– II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.
Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Packages.
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT– III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.
Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT– IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT– V
Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams
Case Study: The Unified library application, ATM System.

TEXT BOOKS

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS

1. Analysis & Design and Unified Process, Craig Larman, Pearson Education.
2. Object Oriented Analysis, Design and Implementation,B.Dathan. S.Ramnath, Universities Press.
3. Learning UML 2.0, Russ Miles and Kim Hamilton, O'Reilly, SPD.

III YEAR B.Tech. CSE - II Sem

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COMPUTER GRAPHICS

(PROFESSIONAL ELECTIVE–2)

Course Outcomes:

At the end of the course, student will be able to:

1. Outline the areas of Computer Graphics.
2. Examine various 2D Geometrical transforms.
3. Understand 3D Geometrical transforms.
4. Apply different visible surface detection methods.
5. Plan the sequence of an animation for a given scenario.

UNIT-I

Introduction
Application areas of Computer Graphics, overview of graphics systems, video-display devices and raster-scan systems, random scan systems, graphics monitors and work stations and input devices.
Output Primitives
Points and lines, tine drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II

2D Geometrical Transformations
Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms transformations between coordinate systems.
2D Viewing
The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen- Sutherland and Cyrus-beck line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT-III

3D Object Representation
Polygon surfaces, quadric surfaces. spline representation, Hermite curve, Bezier curve and B-spine curves. Bezier and B-spline surfaces, sweep representations, octrees BSP Trees.
3D Geometric transformations
Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and Clipping.

UNIT-IV

Visible Surface Detection Methods:
Classification, back face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, and area sub division and octree methods.
Illumination Models and Surface Rendering Methods Basic illumination models, polygon rendering method.

UNIT-V

Computer Animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame system, Motion specification.

TEXT BOOK

1 "Computer Graphics C version", Donald Hearn and M. Pauline Baker, Pearson education.

REFERENCE BOOKS

1 Computer Graphics Principles & practice, second edition In C, Foley, VanDam, Feiner and Hugues, Pearson Education.
2 "Computer Graphics Second edition", Zhigand xiang. Roy Plastock, Schaum's outlines. rats Mc Graw 19 edition.
3 Procedural elements lot Computer Graphics, David F Rogers. Tata Mc Graw hill, 2nd edition.
4 Principles of interactive Computer Graphics. Neuman and Sprout TMH.
5 Principles of Computer Graphics. Shalni, Govil-Pal, Springer.
6 Computer Graphics F.S.H. S.M.Kelley. PHI.

III YEAR B.Tech. CSE - II Sem

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ARTIFICIAL INTELLIGENCE

(PROFESSIONAL ELECTIVE–3)

Course Outcomes:
At the end of the course, student will be able to:

1. Ability to formulate an efficient problem space for a problem expressed in natural language.
2. Select a search algorithm for a problem and estimate its time and space complexities.
3. Possess the skill for representing knowledge using the appropriate technique for a given problem
4. Possess the ability to apply AI techniques to solve problems of game playing, expert systems, machine learning and natural language processing.
5. Understand Decision Tree leaning and its application.

UNIT I

Introduction:AI problems, The Underlying Assumption, AI Techniques, The Level of the Model, Criteriafor Success
Problems, Problem Spaces and Search: Defining the Problem as a State Space Search,Production Systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs
Heuristic Search Techniques: Generate – and – Test, Hill Climbing, Best – First Search, Problem Reduction, ConstraintSatisfaction, Means-Ends Analysis.

UNIT II

Knowledge Representation: Issues in Knowledge Representation, Representing Simple Facts in Predicate Logic,Representing Instance and ISA Relations, Computable Functions and Predicates, Resolution,Natural Deduction
Representing Knowledge Using Rules: Procedural Vs Declarative Knowledge, Logic Programming, Forward Vs Backward Reasoning, Matching, Control Knowledge
Weak Slot – and – Filler Structures: semantic nets, frames
Strong Slot – and – Filler Structures: conceptual dependency, scripts, CYC

UNIT III

Reasoning Techniques: Introduction to Nonmonotonic reasoning, Logics for Nonmonotonic Reasoning,Implementation Issues, Augmenting a Problem Solver, Implementation of Depth First Searchand Breadth First Search, Probability and Bayes Theorem, Certainty Factors and Rule-basedSystems, Bayesian Networks.

UNIT IV

Game Playing: Overview, Minimax Search, Alpha – Beta Cutoffs
Planning System: Overview, The Blocks World, Components of a Planning System, Goal Stack Planning, Hierarchical Planning
Understanding: Understanding as constraint satisfaction, Waltz Algorithm
Natural Language Processing: Introduction, Syntactic Processing, Augmented Transition Networks, Semantic Analysis

UNIT V

Learning: What Is Learning? Rote Learning, Learning by Taking Advice, Learning in Problem Solving,Learning from Examples, Winston's Learning Program, Decision Trees
Expert Systems: Representing and Using Domain Knowledge, Shell, Explanation, Knowledge Acquisition.

Text Books:

1) Artificial Intelligence" 3rd Edn. , E.Rich and K.Knight (TMH)

References:

1) Artificial Intelligence A Modern Approach, Second Edition, Stuart Russell, Peter Norvig, PHI/ Pearson Education.
2) Artificial Intelligence and Expert systems – Patterson PHI

III YEAR B.Tech. CSE - II Sem

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SOFTWARE TESTING METHODOLOGIES
(PROFESSIONAL ELECTIVE–3)

Course Outcomes:

At the end of the course, student will be able to:

1. Understand the purpose of Software testing.
2. Outline various transaction flow testing techniques.
3. Understand domain testing.
4. Construct decision tables for Logic Based Testing.
5. Implement node reduction algorithm.

UNIT-I:

Introduction Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Flow graphs and Path testing basic concepts, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II:

Transaction Flow Testing Transaction flows, transaction flow testing techniques. Data flow testing Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT-III:

Domain Testing Domains and paths, Nice & ugly domains, domain testing. Domains and interfaces testing, domain and interface testing, domains and test ability.

UNIT-IV

Paths, Path Products and Regular Expressions Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection. Logic Based Testing overview, decision tables, path expressions, KV charts, specifications.

UNIT-V

State, State Graphs and Transition Testing State graphs, good & bad state graphs, state testing, Testability tips. Graph Matrices and Application Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

TEXT BOOK

1. Software Testing techniques — Boris Beizer, Dreamtech, second edition.

REFERENCE BOOKS

1. Software Testing Tools — Dr.K.V.K.K.Prasad, Dreamtech.
2. The craft of software testing – Brian Marick, Pearson Education.
3. Effective methods of Software Testing, perry, John Wiley, 2nd Edition, 1999.

III YEAR B.Tech. CSE - II Sem

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ADVANCED DATABASES
(PROFESSIONAL ELECTIVE–3)

Course Outcomes:
At the end of the course, student will be able to:

1. Understand the concepts of Distributed Database Systems.
2. Identify different Architectural Models for Distributed DBMS.
3. Characterize the query processors.
4. Design Algorithms for Concurrency control Mechanisms.
5. Decide different Parallel DBMS Techniques based on given constraints.

UNIT-I:
Introduction
Distributed Data Processing, Distributed Database System, Promises of DDBSs, Design Issues.

UNIT-II:
Distributed DBMS Architecture: ANSI SPARC, Centralized DBMS Architecture, Architectural Models for Distributed DBMS.
Distributed Database Design: Top-Down Design Process, Distribution Design issues, Fragmentation, Allocation.

UNIT-III:
Introduction to RDBMS: Overview of Relational DBMS: Relational Database Concepts, Normalization, And Relational Data Languages.
Query Processing and Decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT–IV:
Distributed Query Optimization: Query optimization, centralized query optimization, Distributed query optimization algorithms.
Transaction Management: Definition, properties of transaction; types of transactions.

UNIT-V:
Distributed Concurrency Control: Serializability theory, Concurrency control Mechanisms & Algorithms; Time stamped & Optimistic concurrency control algorithms, Deadlock Management, Relaxed Concurrency Control.

TEXT BOOKS:

1. Distributed Databases Stefano Ceri and Willipse Pelagatti:, McGraw Hill.
2. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez, 3rd Edition, Springer.

REFERENCE BOOKS:

1 M.Tamer OZSU and Pauck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.
2 Henry F Korth, A Silberchatz and Sudershan : Database System Concepts. Tata MGH.
3 Raghurama krishnan and Johhanes Gehrke: Database Management Systems, MGH

III Year B.Tech. CSE – II Sem

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DATA MINING & CASE TOOLS LAB

Course outcomes:
At the end of the course, student will be able to:

1. Explore Weka environment
2. Apply data mining techniques for realistic data
3. Apply the phases of OOAD to real time applications

Data Mining Lab

Week-1: Demonstrate Apriori based Association Rule Mining
Week-2: Demonstrate FP –growth based Association Rule Mining
Week-3: Weather classification using WEKA Tool
Week-4: Demonstrate K-means based Clustering
Week-5: Demonstrate Hierarchical Clustering
Week-6: Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

Case Tools Lab
Week 1 & Week 2:
Draw the following diagrams using UML for an ATM system whose description is given below.
UML diagrams to be developed are:
1. Use Case Diagram
2. Class Diagram
3. Sequence Diagram
4. Collaboration Diagram
5. State Diagram
6. Activity Diagram
7. Component Diagram
8. Deployment Diagram

Description for an ATM System
The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the ma-chine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)
The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification

when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.

3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

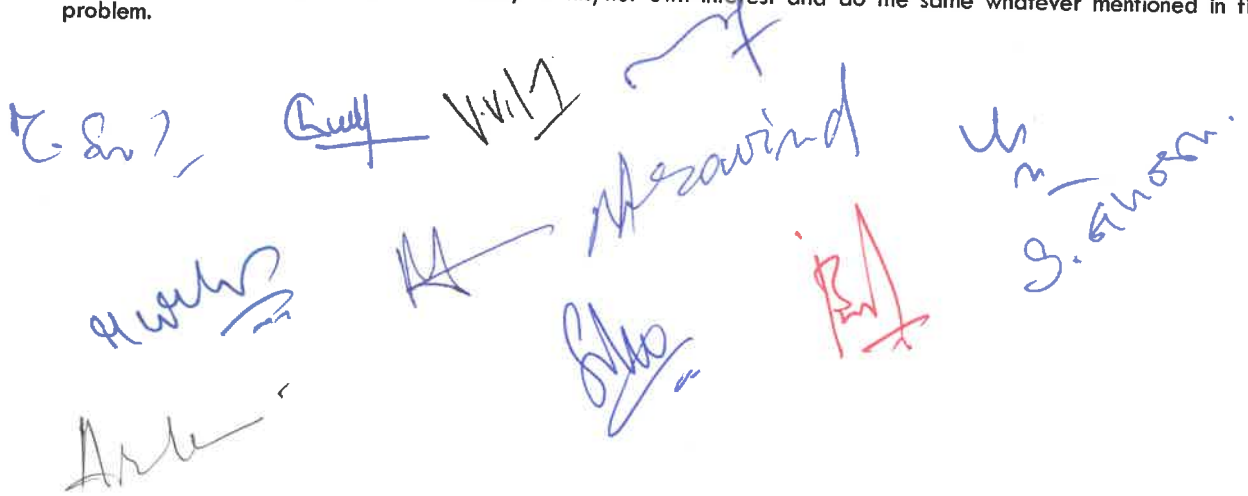
The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction. The ATM will provide the customer with a printed receipt for each successful transaction.

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit enve-lopes and reload the machine with cash, blank receipts, etc.

Week 3 & Week 4:
The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

Week 5 & Week 6:
Student has to take up another case study of his/her own interest and do the same whatever mentioned in first problem.



IV Year B.Tech. CSE – I Sem

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Mobile Application Development

Course Outcomes:
At the end of this course, the student would be able to:

1. Understand the basics of Android devices and Platform.
2. Acquire knowledge on basic building blocks of Android programming required for App development.
3. Understand persistence Data storage mechanism in Android
4. Understand advanced application concepts like networking, Animations and Google Maps services etc.
5. Develop and publish Android applications in to Android Market

UNIT I: JAVA FX TECHNOLOGY FOR RICH CLIENT APPLICATIONS
Introduction: Introduction to mobile application development, trends, introduction to various platforms, introduction to smart phones
Android platform: Android platform features and architecture, versions, comparison added features in each versions. ART(Android Runtime),ADB(Android Debug Bridge).
Development environment/IDE: Android studio and its working environment, gradle build system, emulator setup
Application anatomy: Application framework basics: resources, layout, values, asset XML representation and generated R.Javafile ,Android manifest file. Creating a simple application.

UNIT II : ANDROID UI DESIGN
GUI for Android: Introduction to activities, activities life-cycle, Android v7 support library form API21 for lower version support
Intent :intent object, intent filters ,adding categories, linking activities, user interface design components
Views and View Groups: Basic views, picker views, adapter views, Menu, App Bar etc, basics of screen design; different layouts. App widgets.
Lollipop Material design: new themes, new widgets, Card layouts. Recycler View
Fragments: Introduction to activities, activities life-cycle.

UNIT III: DATA PERSISTENCE
Different Data persistence schemes: Shared preferences, File Handling, Managing data using SQLite database
Content providers: User content provider, Android in build content providers.

UNIT IV: BACK GROUND RUNNING PROCESS, NETWORKING AND TELEPHONY SERVICES
Services :introduction to services – local service, remote service and binding the service, the communication between service and activity, Intent Service.
MultiThreading: Handlers ,AsyncTask
Android network programming :HttpUrlConnection, Connecting to REST-based and SOAP based Web services
Broad cast receivers: LocalBroadcastManager, Dynamic broadcast receiver, System Broadcast. PendingIntent, Notifications
Telephony Manager: Sending SMS and making calls.

UNIT V: ADVANCED APPLICATIONS
Location based services: Google maps V2 services using Google API,
Animations and Graphics: Property Animation ,View Animations, Drawable Animations
Media and Camera API: Working with video and audio inputs, camera API
Sensor programming: Motion sensors, Position sensors, Environmental sensors.
Publishing Android Apps: Guide lines, policies and process of uploading Apps to Google play

Text Books:
1. Dawn Griffiths, David Griffiths,*"Head First: Android Development" ,OReilly2015,ISBN:* 9781449362188
2. J.F.DiMarzio's, "Android 4 Application Development"

Reference Books:
1. Greg Milette,Adam Stroud,"PROFESSIONALAndroid™ Sensor Programming", John Wiley and Sons, Inc2012,ISBN/978111265055,9781280678943,978111227459
2. Paul Deital,HarveyDeital, Alexander Wald, "Android 6 for Programmers ,App Driven approach",2015, Prentice Hall ,*ISBN:* 9780134289366

IV Year B.Tech. CSE – I Sem

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CLOUD COMPUTING

Course Outcomes:

At the end of this course, the student would be able to:

1. Understand different Cloud Services
2. Outline different approaches for migration into Cloud
3. Investigate enterprise cloud computing paradigm
4. Identify the virtualization concepts
5. Assess the concepts of data security in Cloud Computing

UNIT -1

Introduction to cloud computing: Cloud Computing in a Nutshell, Roots of Cloud Computing, Layers and Types of Clouds, Desired Features of Cloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenge and Risks.

UNIT II

Migration into a Cloud: Introduction, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration in to a Cloud.
Enriching the 'Integration as a Service' Paradigm for the Cloud Era: An Introduction, The Onset of Knowledge Era, The Evolution of SaaS, The challenges of SaaS Paradigm, Approaching the SaaS integration enigma, New integration scenarios, The integration. Methodologies, Saas integration products and platforms, SaaS Integration Services, Business to Business Integration (B2Bi) Services.

UNIT III

The Enterprise Cloud Computing Paradigm: Introduction, Background, Issues for Enterprise Applications on the Cloud, Transition Challenges, Enterprise Cloud Technology and Market Evolution, Business Drivers toward a Marketplace for Enterprise Cloud Computing, the Cloud Supply Chain.

UNIT IV

Virtual Machines Provisioning and Migration Services: Introduction and Inspiration,
Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context, Future Research Directions.
Secure Distributed Data Storage in Cloud Computing: Introduction, Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing, Open Questions and Challenges.

UNIT V
SLA Management in Cloud Computing : A Service Provider's Perspective: Inspiration , Traditional Approaches to SLO Management, Types of SLA, Life Cycle of SLA , SLA Management in Cloud, Automated Policy based Management.
Data Security in the Cloud: An Introduction to the idea of Data Security, The Current State of Data Security in the Cloud, Homo Sapiens and Digital Information, Cloud Computing and Data Security Risk, Cloud Computing and Identity, Digital Identity and Data Security, Content Level Security-Pros and Cons.

Text Book:

1. Rajkumar Buyya, James Broberg, AndrZejGoscinski, Cloud Computing Principles and Paradigms, Wiley Publications.

Reference Books:

1. Michael Miller, Cloud Computing – Web-Based Application That Change the Way You Work and Collaborate Online, Pearson Publications.
2. Thomas Erl, Zaigham Mahmood, & Ricardo Puttini, Cloud Computing- Concepts, Technology & Architecture Pearson Publications.
3. Kai Hwang, Geoffrey C.Fox. Jack J. Dongarra, Distributed and Cloud Computing – From Parallel Processing to the Internet of Things, ELSEVIER Publications.

IV Year B.Tech. CSE – I Sem

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BIG DATA ANALYTICS
(PROFESSIONAL ELECTIVE–4)

Course Outcomes:
At the end of this course, the student would be able to:

1. Explain the foundations, definitions, and challenges of Big Data.
2. Use Hadoop file system interfaces.
3. Program using HADOOP and Map reduce.
4. Understand various Hadoop Eco Systems like Pig, Hive.
5. Outline Hadoop Eco System using HBase, Zookeeper.

UNIT-I
Introduction to Big Data and Hadoop
Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analyzing Data with Unix tools, Analyzing Data with Hadoop, Hadoop Streaming, Hadoop Echo System.

UNIT-II
HDFS (Hadoop Distributed File System)
The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT-III
Map Reduce
Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

UNIT-IV
Hadoop Eco System-I
Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.
Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

UNIT-V
Hadoop Eco System-II
HBase: HBasics, Concepts, Clients, Example, Hbase versus RDBMS.
Zookeeper: The Zookeeper Services, Zookeeper in Production.

TEXT BOOK

1. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reily Media, 2012.

REFERENCE BOOKS

1. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015. References
2. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
3. Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)
4. Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.
5. Anand Rajaraman and Jef rey David Ulman, "Mining of Massive Datasets", Cambridge University Press, 2012.
6. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", John Wiley & sons, 2012.
7. Glen J. Myat, "Making Sense of Data", John Wiley & Sons, 2007
8. Pete Warden, "Big Data Glossary", O'Reily, 2011.
9. Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.

IV Year B.Tech. CSE – I Sem

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INTERNET OF THINGS (IoT)

(PROFESSIONAL ELECTIVE–4)

Course Outcomes:

At the end of this course, the student would be able to:

1. Describe various IoT enabled technologies.
2. Understand the concepts of M2M with necessary protocols.
3. Illustrate Python programming for IoT
4. Examine the Python programming with Raspberry PI
5. Design web applications for IoT

UNIT I

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT– IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT II

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPPER.

UNIT III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Web server – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API.

Case study: Amazon web services for IoT.

TEXT BOOK(S)

1. Internet of Things - A Hands-on Approach, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.

2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

REFERENCE BOOK(S):

1.Getting started with the Internet of Things: connecting sensors and micro controllers to the cloud – CUNO Pfister, O' Reily publications

IV Year B.Tech. CSE – I Sem

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R PROGRAMMING
(PROFESSIONAL ELECTIVE–4)

Course Outcomes:

At the end of this course, the student would be able to:

1. Apply operations on basic data types using R
2. Apply various operators on data frames, factors and list
3. Develop functions using iterative programming for real world problems
4. Analyze the data by plotting using R
5. Formulate linear and multiple regression models for time series data & web data

Unit – I

Basics of R: Introduction, R-Environment Setup, Programming with R, Basic Data Types, Vectors: Creating and Naming Vectors, Vector Arithmetic, Vector Subsetting, Matrices: Creating and Naming Matrices, Matrix Subsetting, Arrays, Class.

Unit – II

Factors and Data Frames : Introduction to Factors: Factor Levels, Summarizing a Factor, Ordered Factors, Comparing Ordered Factors, Introduction to Data Frame, Subsetting of Data Frames, Extending Data Frames, Sorting Data Frames,

Lists: Introduction, Creating a List: Creating a Named List, Accessing List Elements, Manipulating List Elements, Merging Lists, Converting Lists to Vectors, Conditionals and Control Flow: Relational Operators, Relational Operators and Vectors, Logical Operators, Logical Operators and Vectors, Conditional Statements.

Unit – III

Iterative Programming in R: Introduction, While Loop, For Loop, Looping Over List.

Functions in R: Introduction, Writing a Function in R, Nested Functions, Function Scoping, Recursion, Loading an R Package, Mathematical Functions in R, Cumulative Sums and Products, Calculus in R, Input and Output Operations.

Unit – IV

Apply Family in R : Introduction, Using Apply in R, Using Lapply in R, Using Sapply, Using Tapply in R: Split Function, Using Mapply in R, Charts and Graphs : Introduction, Pie Chart: Chart Legend, 3D Pie Chart, Bar Chart, Box Plot, Histogram, Line Graph: Multiple Lines in Line Graph, Scatter Plot.

Unit-V

Data Interfaces: Introduction, CSV Files: Syntax, Importing a CSV File, Excel Files: Syntax, Importing an Excel file, Binary Files: Syntax, XML Files, Web Data, Databases.

Statistical Applications: Introduction, Basic Statistical Operations, Linear Regression Analysis, Chi-Squared Goodness of Fit Test, Chi-Squared Test of Independence, Multiple Regression, Time Series Analysis.

Text Books:

1. K G Srinivas ,G M Siddesh "Statistical programming in R", Oxford Publications.

References:

1. K Beginning R: The Statistical Programming Language,Mark Gardener,Wrox
2. Y. anchang Zhao ,R and Data Mining: Examples and Case Studies . Elsevier in December 2012.
3. Avril Coghlan ,A Little Book of R For Time Series,Release 0.2.

IV Year B.Tech. CSE – I Sem

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DISTRIBUTED SYSTEMS

(PROFESSIONAL ELECTIVE–5)

Course Outcomes:
At the end of this course, the student would be able to:

1. Able to understand characteristics of distributed Systems.
2. Analyze the concepts of time and global states.
3. Able to differentiate the types of inter process communication.
4. Able to understand file service architecture.
5. Able to analyze the distributed transaction management.

Unit I:

Characterization of Distributed Systems: Introduction, Examples of Distributed systems, Resource sharing and web, challenges,

System Models: Introduction, Architectural Models, Fundamental models.

Unit II:

Time and Global States: Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical Time and Logical clocks, distributed debugging, Distributed mutual exclusion.

Unit III:

Interprocess Communication: Introduction, The API for the Internet Protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call , Events and Notifications, Case Study:JAVA RMI.

Unit IV:

Distributed file system: Introduction, , File service architecture, Case Study 1: Sun Network File System, Case Study 2: The Andrew File System.

Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case Study of the Global Name Services.

Unit V:

Transactions and Concurrency control: Introduction, Transactions, Nested Transactions Locks, Optimistic concurrency control, Timestamp ordering, Comparison of Methods for Concurrency control

Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols

Text Books:

1. G Coulouris, J Dollimore, T Kindberg, Distributed Systems Concepts and Design, Third Edition, Pearson Education.

Reference Books:

1. S.Mahajan and S.Shah, Distributed Computing, Oxford University Press.
2. PradeepK.Sinha, Distributed Operating Systems Concepts and Design, PHI.
3. A.S. Tanenbaum and M.V. Steen, Distributed Systems: Principles and Paradigms, Pearson Education.
4. A.S.Tanenbaum, Distributed Operating Systems, Pearson Education.

IV Year B.Tech. CSE – I Sem

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MOBILE COMPUTING

(PROFESSIONAL ELECTIVE–5)

Course Outcomes:
At the end of this course, the student would be able to:

1. Think and develop new mobile application.
2. Take any new technical issue related to this new paradigm and come up with a solution(s).
3. Develop new ad hoc network applications and/or algorithms/protocols.
4. Understand & develop any existing or new protocol related to mobile environment
5. Understand Data Transformation.

UNIT – I: Introduction: Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices. GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT – II: (Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11) Mobile Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT – III: Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks. Database Issues: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues.

UNIT – IV: Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols.

UNIT – V: Mobile Adhoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery. Protocols and Platforms for Mobile Computing: WAP, Bluetooth, XML, J2ME, Java Card, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

TEXT BOOKS:

- Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2009.
- Raj Kamal, "Mobile Computing", Oxford University Press, 2007, ISBN: 0195686772.

REFERENCE BOOKS:

- Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2004.
- Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
- Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, Oct 2004

IV Year B.Tech. CSE – I Sem

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SEMANTIC WEB AND SOCIAL NETWORKS
(PROFESSIONAL ELECTIVE - 5)

Course Outcomes:

At the end of this course, the student would be able to:

1. Identify the Structure of the Semantic Web Technology in reference with the World Wide Web.
2. Design the concepts of Resource Description Framework, Ontology and Web Ontology Language (OWL).
3. Understand Ontology Engineering Tools and Methods.
4. Apply Logic, Rule and Inference Engines in Semantic Applications.
5. Understand and Analyze Social Networks and design solution for Web based Social Networks like Blogs and Online Communities.

UNIT-I

Empowering the Information Age : Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web.
Turing: What is Machine Intelligence? : Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents.
Berners-Lee: What is Solvable on the Web? : Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT-II

Resource Description Framework: HTML Language, XML Language, RDF Language, Basic Elements, RDF Schema.
Web Ontology Language: Ontology Language, Ontology Language Requirements, Compatibility of OWL and RDF/RDFS, The OWL Language, Basic Elements, OWL Example: Compute Ontology, OWL Capabilities and Limitations.

UNIT-III

Ontology Engineering: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT-IV

Logic, Rules, Inference & Semantic Web Applications: Logic, Rule and Inference, Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base.
Semantic Search Technology: Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods.

UNIT-V

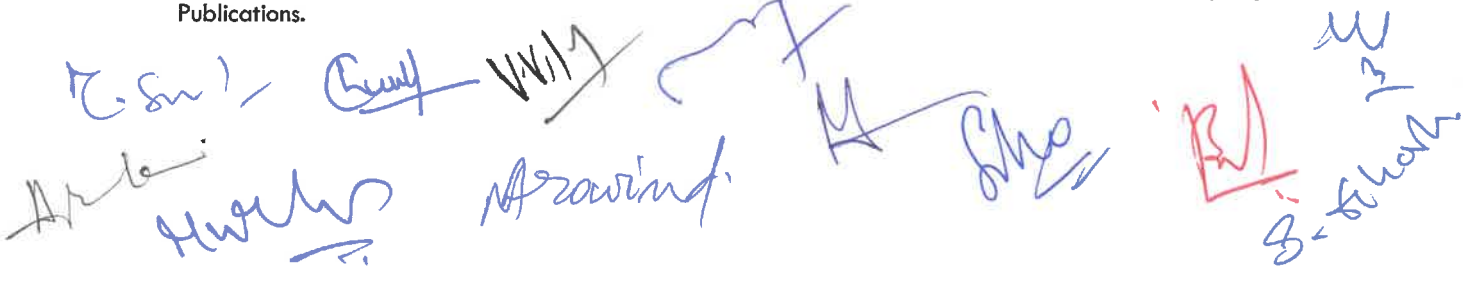
Social Network Analysis: What is Networks analysis, Development of the social networks analysis.
Electronic sources for network analysis: Electronic Discussion networks. Blogs and Online Communities, Web Based Networks.
Developing social-semantic applications: Building Semantic Web Applications with social network features, Semantic Web Architecture.

TEXT BOOKS

1. Thinking on the Web – Berners Lee, Godel and Turing, Wiley interscience, 2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

REFERENCE BOOKS

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Audi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information sharing on the semantic Web – Heiner Stucken schmidt; Frank Van Harmelen, Springer Publications.



IV Year B.Tech. CSE – I Sem

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MACHINE LEARNING
(PROFESSIONAL ELECTIVE -6)

Course Outcomes:

At the end of this course, the student would be able to:

1. Ability to understand the basic concepts such as Decision trees and Neural Networks.
2. Analyze various Machine Learning techniques and their efficiency.
3. Apply Machine Learning algorithms to solve problems of moderate complexity.
4. Understand Genetic algorithms and their applications.
5. Identify ML Applications.

Unit – I

Introduction and Concept Learning: An illustrative learning task, A few approaches of learning task, what is known from algorithms? Theory, Experiment, Biology and Psychology, Introduction to Concept Learning, Version Space, Inductive Bias, Active Queries, Mistake Bound/PAC Model, Basic Results, Overview of issues regarding data sources, Success Criteria

Unit II

Decision Tree learning and Neural Network learning: Introduction to Decision Tree Learning, Minimum Description Length Principle, Occam's razor, Learning with active queries, Introduction to Neural Network Learning, Introduction to Perceptions, Perceptions, Introduction to Gradient Descent and Back propagation.

Unit III

Sample Complexity and Over fitting And Bayesian Approaches: Introduction to Sample Complexity and Over fitting, Errors in estimating means, Cross Validation and Jackknifing VC Dimension, Irrelevant features , Multiplicative rules for Weight tuning, Introduction to Bayesian Approaches, The basics Expectation Maximization, Hidden Markov Models

Unit – IV

Instance-based Techniques: Introduction to Instance-based Techniques, Lazy vs. eager generalization, K nearest neighbor, Case-based reasoning

Unit – V

Genetic Algorithms: Different search methods for induction, Explanation based Learning, Using prior knowledge to reduce sample complexity

Text Books:

1. Machine Learning - Mc Graw Hill, Tom M. Mitchell.
2. Trevor Hus tie, Robert Tibshirani& Jerome Friedman. The Elements of Statically Learning, Springer Veriag 2001

REFERENCE BOOKS

1. Machine Learning Methods en the Environmental Science, Neural Network, William W Hsieh Cambridge UniversityPress.
2. Rbchard o Duda, Peter E. Hart and David G. Stork, & pattern Classification,.John Wiley & Sons Inc,2001
3. Chris Bishop, Neural Network for, Pattern Recognition, Oxford University Press. 1995

IV Year B.Tech. CSE – I Sem

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E – COMMERCE
(Professional Elective - 6)

Course Outcomes:
At the end of this course, the student would be able to:

1. Identify the anatomy of E-Commerce applications and its process models.
2. Categorize different Electronic payment systems.
3. Examine Supply chain Management.
4. Analyze the various marketing strategies for an online business.
5. Design strategies for E-Commerce Catalogues.

UNIT-I
Electronic Commerce
Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications and E-Commerce organization applications, Consumer Oriented Electronic commerce, Mercantile Process models.

UNIT-II
Electronic Payment Systems
Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce – EDI, EDI Implementation, Value added networks.

UNIT-III
Intra Organizational Commerce – work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT-IV
Corporate Digital Library – Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing – Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT-V
Consumer Search and Resource Discovery
Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia – key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK
1. Frontiers of electronic commerce — Kalakata, Whinston, Pearson.

REFERENCES
1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce Gary P.Schneider — Thomson.

IV Year B.Tech. CSE – I Sem

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CYBER FORENSICS

(PROFESSIONAL ELECTIVE -6)

Course Outcomes:
At the end of this course, the student would be able to:

1. Perform a forensic investigation by following guidelines to secure the crime or corporate scene.
2. Learn what legal issues are involved and what rights the person of interest has.
3. Perform digitally and court approved images of evidence to be used in a court of law.
4. Learn how to document and store evidence.
5. Learn how to analyze evidence using commercial forensic software and also how to create a report of the said evidence.

Unit I: Computer Forensics and Investigations: What is computer Forensics? Use of computer forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceeding, Computer Forensics services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists.
Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of law Enforcement-Computer forensic Technology – Types of Business computer Forensic Technology.

Unit II:
Computer Forensics Evidence and capture: Data Recovery Defined Data Backup and Recovery – The Role of Back-up in Data Recovery – The Data – Recovery Solution
Evidence Collection and Data Seizure: Why Collection Evidence? Collection Options - Obstacles - Types of Evidence – The Rules of Evidence – General Procedure – Collection and Archiving –Methods of Collection – Artifacts – Collection Steps.
Controlling Contamination: The Chain of Custody duplication and Preservation of Digit Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps – Legal Aspects of Collection and Preserving computer Forensics Evidence.

Unit –III:
Computer Image Verification and Authentication: Special Needs of Evidential Authentication – Practical Consideration – Practical Implementation.
Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, Hiding Partitions, Marking bad clusters, Stegonography to hide data, performing remote acquisitions.
Network Forensics: Network Forensics: Network forensics overview, performing live acquisitions.

Unit –IV: Processing Crime and Incident Scenes: Identifying Digital Evidence, Collecting the Evidence in Private-Sector Incident Scenes, Processing law Enforcement Crime Scenes, Preparing for a Search, Securing a Computer Incident or Crime Scene, Sizing Digital evidence at the Scene, Storing Digital evidence, obtaining a Digital Hash.

Current Computer Forensics Tools: Evaluating Computer Forensics Tool Needs, Computer Forensics Software Tools, Computer Forensics Hardware Tools, Validating and Testing Forensics Software

Unit –V: E-mail Investigations and Cell Phone and Mobile Device Forensics: Exploring the Role of E-mail in Investigations, Exploring the Role of Client and Server in E-mail, Investigating E-mail Crimes and Violations, Understanding E-mail Servers, Using Specialized E-mail Forensics Tools, Understanding Mobile Device Forensics, Understanding Acquisition Procedure for Cell Phones and Mobile Devoices

Text Books:

1. John R.Vacca, Computer Forensics, Computer Crime Investigation, firewall Media, New Delhi
2. Nelson, Phillips Enfinger, Steuart, Computer Forensics and Investigations, Cengage Learning.

Reference Books:

1. Keith J. Jones, Richard Bejthich, Curtis W Rose ,Real Digital Forensics, Addition- Wesley Pearson Education.
2. Tony Sammesand Bairn Jenkinson, Forensic Compiling A Practitioner's Guide, ,Springer International edition.
3. Christopher L.T.Brown, Computer Evidence Collection & Presentation, Firewall Media.
4. Jesus Mena , Homeland Security, Techniques & Technologies, Firewall Media.

IV Year B.Tech. CSE – I Sem

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MOBILE APPLICATION DEVELOPMENT LAB

Course Outcomes:

1. Ability to develop GUI based android applications.
2. Ability to develop event based android applications.
3. Design android applications that can access database.

LIST OF EXPERIMENTS

Week 1: Installation and configuration of Android Studio

Week 2: Develop an application that uses GUI components to display a "Hello World" message and change its color and font size.

Week 3: Develop an application that receives user's name, contact and city and displays the same using Layout Managers and Event Listeners.

Week 4: Create a native calculator application.

Week 5: Design an application that draws basic graphical primitives: line, circle, square, rectangle etc., on the screen.

Week 6: Develop a Registration and Login application that makes use of database.

Week 7: Develop an application that makes use of RSS Feed.

Week 8: Create an application that implements Multi threading.

Week 9: Develop a native application that uses GPS location information.

Week 10: Implement an application that writes data to the SD card.

Week 11: Develop an application that creates notification upon receiving a message.

Week 12: Create an alarm clock mobile application.

IV Year B.Tech. CSE – I Sem

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BIG DATA ANALYTICS LAB
(PROFESSIONAL ELECTIVE–4 LAB)

Course Outcomes:
At the end of this course, the student would be able to:

1. To introduce the tools required to manage and analyze big data like Hadoop,NoSql
2. To impart knowledge of map reduce paradigm to solve complex problems Map-Reduce
3. To introduce several new algorithms for big data mining like classification, clustering and finding frequent patterns

LIST OF EXPERIMENTS

Week 1, 2:
1. Implement the following Data structures in Java
a) Linked Lists b) Stacks c) Queues d) Set e) Map
Week 3
2. Perform setting up and Installing Hadoop in Pseudo distributed mode
Week 4:
3. Implement the following file management tasks in Hadoop:
i. Adding files and directories
ii. Retrieving files
iii. Deleting files
Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.
Week 5:
4. Run a basic Word Count Map Reduce program to understand Map-Reduce Paradigm.
Week 6:
5. Write a Map Reduce program that mines weather data.
Weather sensors collecting data every hour at many locations across the globe gather a Large volume of log data, which is a good candidate for analysis with Map-Reduce, since it is semi structured and record-oriented.
Week 7:
6. Implement Matrix Multiplication with Hadoop Map Reduce
Week 8, 9:
7. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your Data.
Week 10, 11:
8. i) Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, Functions and indexes
ii) Performance techniques in Hive partitions, bucketing.
Week 12:
9. Migration from Mysql database to hive using Sqoop

IV Year B.Tech. CSE – I Sem

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INTERNET OF THINGS LAB

(PROFESSIONAL ELECTIVE–4 LAB)

Course outcomes:
At the end of this course, the student would be able to:

1. Apply the concepts of IoT by identifying different related technologies.
2. Apply IoT to different applications by evaluating IoT protocols.
3. Design and develop smart IoT solutions by analyzing the data received from sensors.

List of Experiments

Week 1:

1. Introduction to Arduino Uno – Sensors & Actuators
    a. Temperature & Humidity Sensors
    b. Air Quality Sensor
    c. PIR Motion Sensor
    d. Micro Servo Motor
    e. Stepper Motor
    f. 100RPM Motor

Week 2:

2. Introduction to NodeMCU – Sensors & Actuators
    a. Temperature & Humidity Sensors
    b. Air Quality Sensor
    c. PIR Motion Sensor
    d. Micro Servo Motor
    e. Stepper Motor
    f. 100RPM Motor

Week 3:

3. Setting up your Raspberry Pi. Installation of software.
4. Introduction to Raspberry Pi – Sensors & Actuators
    a. Temperature & Humidity Sensor
    b. Ultrasonic Sensor
    c. Micro Servo Motor

Week 4:

5. Introduction to IoT & Sensor control with IFTTT

Week 5:

6. Build a Web-App: Blinking an LED over Internet
7. Build a Web-App: Control a motor over Internet when motion is detected

Week 6:

8. Live Temperature and Humidity monitoring over Internet.

Week 7:

9. Introduction to Open Source Cloud Platforms for IoT: OpenIoT, ThingSpeak

Week 8:

10. Open Source Cloud Platforms for IoT: thinger.io, Google Cloud Platform.

Week 9 & 10:

11. Introduction to Open Web Services for IoT
12. Experiments with Open Web Services for IoT:
    a. M2M Labs
    b. The ThingBox
    c. The Thing System
    d. Node-RED

Week 11:

13. Home Automation System

Week 12:

14. Build a RESTful web service for IoT Management

Week 13:

15. Build a web server for IoT Management

IV Year B.Tech. CSE – I Sem

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R PROGRAMMING LAB
(PROFESSIONAL ELECTIVE–4 LAB)

Course outcomes:
At the end of this course, the student would be able to:

1. Explore R environment
2. Visualize data insights using charts and graphs
3. Analysis data with linear regression model

Week-1:

Installation and Environment set up R and Rstudio

Week-2:

Experiments on Vector Arithmetic operations

Week-3:

Experiments on Matrices operations

Week-4

Experiments on Arrays functions

Week-5:

Experiments on Factors

Week-6:

Experiments on Data Frames

Week-7:

Experiments on List operations

Week-8:

Write R scripts which demonstrate logical operations and Conditional Statements

Week-9:

Write R scripts which demonstrate Looping Over List

Week-10:

Write R scripts which demonstrate Nested Functions and Function Scoping

Week-11:

Experiments on Mathematical Functions in R

Week-12:

Experiments on Calculus in R

Week13:

Experiments on Lapply, Sapply and Apply functions

Week-14:

Generate different Charts and Graphs using R

III Year B.Tech I Sem

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FUNDAMENTALS OF OPERATING SYSTEMS
(Open Elective – 1)

Course Outcomes:

1. Understand the operating system concepts
2. Analyze the various process scheduling algorithms and synchronization
3. Understand Memory management concepts
4. Illustrate File system implementation
5. Analyze Deadlock mechanisms and system protection

UNIT-I:
Computer System and Operating System Overview: Overview of computer operating systems, operating systems functions, protection and security, distributed systems, special purpose systems, operating systems structures; operating systems generation.

UNIT-II:
Process Management – Process concepts threads, scheduling-criteria algorithms, their evaluation.
Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization.

UNIT-III:
Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation.

UNIT-IV:
File system Interface- The concept of a file, Access Methods, Directory structure, File system mounting and file sharing, protection.
File System implementation- File system structure, file system implementation, directory implementation, directory implementation, allocation methods.

UNIT-V:
Principles of deadlock – System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.
Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix.

Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication.

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCES BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH

III Year B.Tech I Sem

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BASICS OF JAVA PROGRAMMING

(Open Elective-1)

Course Outcomes:

1. Understand OOP concepts to apply basic Java constructs
2. Applying OOP concepts in JAVA programming to solve the problems
3. Analyze different types of inheritance, abstract classes and interfaces
4. Evaluate the usage of Exception Handling
5. Design GUI applications

UNIT – I:

Object Oriented Programming Concepts:, Procedural and Object Oriented Programming paradigms, class, object, Data abstraction , Encapsulation, inheritance ,Polymorphism, Data binding, Message Communication.

Java Basics History of Java, Java buzzwords, simple java program , Comments, variables, data types, constants, scope and life time of variables, operators, expressions, type conversion and casting, Control Statements: selection, iteration and jump statements, arrays.

UNIT – II:

concepts of classes and objects: class fundamentals ,declaring objects, assigning object reference variables, methods, constructors, static variables, static methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion.

UNIT – III

Inheritance – Benefits of inheritance, Inheritance types, method overriding, super keyword, final keyword, abstract classes

Interfaces: Defining and implementing interfaces, extending interfaces, interfaces vs abstract classes

UNIT – IV:

Packages: Creating and Accessing a Package, Understanding CLASSPATH, importing packages, Member Access Rules.

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

UNIT – V:

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, AWTclass hierarchy, Layout Managers –flow, boarder, grid

AWT controls: Label, Button, TextField, TextArea, Checkbox, CheckboxGroup, Choice, and List

Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, create applets, passing parameters to applets.

Text Books:

1. Java- the complete reference, Seventh edition, Herbert Schildt, Tata McGraw Hill.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

Reference Books:

1. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.
3. Programming in JAVA Second Edition, OXFORD Higher Education.

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IV Year B.Tech.– II Sem

FUNDAMENTALS OF DATA BASE MANAGEMENT SYSTEMS
(Open Elective – 2)

Course Outcomes:

1. Understand the concept of database and architecture
2. Design the E-R model and logical database
3. Understand and formulate the SQL queries
4. Analyze the various Relational Query Languages
5. Analyze the various normal form for schema refinement

UNIT-I
Introduction-Database System Applications, Purpose of Database Systems, View of Data - Data Abstraction, Instances and Schemas, Data Models, Database Languages - DDL, DML, Transaction Management, Database Architecture, Database Users and Administrators, History of Data base Systems.

UNIT-II
Introduction to Data base design, ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Conceptual Design with the ER Model. Relational Model: Introduction to the Relational Model –Creating and modifying relations using SQL, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design

UNIT-III
Over view of SQL Query Language, SQL Data definition, Basic structure of SQL Queries, Additional Basic Operations, Set Operations, Aggregate functions, Null values, Sub Queries, Nested and Correlated Sub Queries, Modification of data base (DML), Altering tables.

UNIT-IV
Relational Algebra and Calculus: Relational Algebra - Selection and Projection, Set operations, Renaming, All Types of Joins, Division, Examples of Algebra Queries, Relational calculus - Tuple relational Calculus - Domain relational calculus.

UNIT-V
Introduction to Schema Refinement - Problems Caused by redundancy, Decompositions - Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms - FIRST, SECOND, THIRD Normal forms - BCNF - Properties of Decompositions - Loss less join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design - Multi valued Dependencies - FOURTH Normal Form, Join Dependencies, FIFTH Normal form.

TEXT BOOKS:

1. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw Hill, V edition, 2006.
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill, 3rd Edition, 2003.

REFERENCES BOOKS:

1. Database Systems, 6th edition, Ramez Elmasri, ShamkatB.Mavathe, Pearson Education, 2013.
2. Database Principles, Programming, and Performance, P.O'Neil, E.O'Neil, 2nd ed., ELSEVIER.
3. Database Systems, A Practical approach to Design implementation and Management Fourth edition, Thomas Connolly, carolyn Begg, Pearson education.
4. Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.

IV Year B.Tech.– II Sem

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SOFTWARE ENGINEERING FUNDAMENTALS
(Open Elective – 2)

Course Outcomes:

1. Understand the framework activities for a given project
2. Choose a process model to apply for given project requirements
3. Design various system models for a given scenario
4. Design and apply various testing techniques
5. Analyze the risk's for a given project

UNIT-I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Legacy Software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI).

Process models: The waterfall model, Incremental process models, Evolutionary process models, Agile Process.

UNIT-II:

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

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT-III:

Design Engineering: Design process and Design quality, Design concepts, The design model.

Creating an architectural design: Software architecture, Data design.

UNIT IV:

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

Metrics for Process and Products: Software Measurement, Metrics for software quality.

UNIT V:

Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical Reviews, Statistical Software Quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES:

1. Software Engineering. A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGrawhill,2008.
3. Fundamentals of Software Engineering, Rajid Mall, PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering 1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.

IV Year B.Tech II Sem

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HUMAN COMPUTER INTERACTION
(Open Elective-3)

Course Outcomes:

1. Explain the capabilities of both humans and computers from the viewpoint of human information processing.
2. Describe and use HCI design principles, standards and guidelines.
3. Analyze and identify user models, user support, communication and collaboration models of HCI systems.
4. Discuss about different mobile applications and related design issues.
5. Analyze and discuss HCI issues in virtual reality, multimedia, and Word Wide Web-related environments.

UNIT I

FOUNDATIONS OF HCI: The Human- I/O channels, Human Memory, Thinking: Reasoning ; **The computer-**Display Devices, Memory; **The Interaction-** Models of interaction, frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface.

UNIT II

DESIGN PROCESS: Interaction Design basics – The process of design, Scenarios, Navigation design, Screen Design and layout, Iteration and prototyping; **HCI in software process** – software life cycle, Design rationale; **Design rules** – Principles to support usability, Standards, Guidelines .

UNIT III

MODELS AND THEORIES: Cognitive models: Goal and Task hierarchies, Linguistic and Grammatical models, Physical and Device-level models; Communication and collaboration models.

UNIT IV:

MOBILE HCI: Mobile Ecosystem-Platforms, Application frameworks; **Types of Mobile Applications:** Widgets, Applications, Games; **Mobile Design:** Elements of Mobile Design, Tools.

UNIT V

WEB INTERFACE DESIGN: Drag & Drop, Overlays, Inlays and Virtual Pages, Process Flow.

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004 (UNIT I , II & III).
2. Brian Fling, "Mobile Design and Development", First Edition, O'Reilly Media Inc., 2009 (UNIT –IV).
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009.(UNIT-V).

REFERENCE BOOKS

1. The essential guide to user interface design, Wilbert 0 Galitz, Wiley DreamTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
3. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

IV Year B.Tech II Sem

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INFORMATION SYSTEMS FOR ENGINEERS

(Open Elective-3)

Course Outcomes: At the end of this course, the student would be able to

1. Understand the basic concepts of Information Systems applicable to Engineers.
2. Study the design, development and security of Information Systems.
3. Learn the various modules in ethical and social issues while using Information Systems.
4. Understand issues in data security.
5. Analyse ethics in information systems.

UNIT I – INTRODUCTION

Introduction to Information Technology - Need for information technology; Information Systems: Concepts and overview of information systems; Components of information Systems, Types of Information systems.

UNIT II - SYSTEMS ANALYSIS AND DESIGN

System Analysis : System and system concepts, classification of information System, SDLC framework. System Design-Deterministic System and Probabilistic System, Basic elements of business organization, Business system and objectives.

UNIT III – DATABASES AND INFORMATION MANAGEMENT

Database Management Systems for information Systems: File Organization concepts, Database Management systems, capabilities of DBMS, Database Design, Challenges of Big Data.

UNIT IV - SECURITY IN INFORMATION SYSTEMS

Information Systems Security –System Vulnerability and abuse – improve Business value of security & control using various technologies – framework security and control –recent technologies and tools for protecting information resources.

UNIT V - ETHICS IN INFORMATION SYSTEMS

Ethical and Social Issues in Information Systems – ethics in an information society – moral dimensions of Information Systems.

TEXT BOOKS:

1. Kenneth C. Laudon & Jane P.Laudon, "Management Information Systems" Managing the Digital Firm-Twelfth Edition, Pearson.

2. Gerald V.Post David L. Anderson, "Management Information System-Solving Business Problems with Information Technology" Tata McGraw Hill Publishing Co. ltd, New Delhi

REFERENCES:

1. Management Information Systems by CSV Murthy, HIM publishers

2. Raymond Meleod, JR "Information Systems" Mac Millan Publishing Co. ltd4th Edition.

I Year M.Tech CSE

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HUMAN COMPUTER INTERACTION
(Open Elective-1)

Course Outcomes:

6. Explain the capabilities of both humans and computers from the viewpoint of human information processing.
7. Describe and use HCI design principles, standards and guidelines.
8. Analyze and identify user models, user support, communication and collaboration models of HCI systems.
9. Discuss about different mobile applications and related design issues.
10. Analyze and discuss HCI issues in virtual reality, multimedia, and Word Wide Web-related environments.

UNIT I

FOUNDATIONS OF HCI: The Human- I/O channels, Human Memory, Thinking: Reasoning ; **The computer-**Display Devices, Memory; **The Interaction-** Models of interaction, frameworks and HCI, Ergonomics, Interaction styles, Elements of the WIMP interface.

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DESIGN PROCESS: Interaction Design basics – The process of design, Scenarios, Navigation design, Screen Design and layout, Iteration and prototyping; **HCI in software process –** software life cycle, Design rationale; **Design rules –** Principles to support usability, Standards, Guidelines .

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MODELS AND THEORIES: Cognitive models: Goal and Task hierarchies, Linguistic and Grammatical models, Physical and Device-level models; Communication and collaboration models.

UNIT IV:

MOBILE HCI: Mobile Ecosystem-Platforms, Application frameworks; **Types of Mobile Applications:** Widgets, Applications, Games; **Mobile Design:** Elements of Mobile Design, Tools.

UNIT V

WEB INTERFACE DESIGN: Drag & Drop, Overlays, Inlays and Virtual Pages, Process Flow.

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3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O'Reilly, 2009.(UNIT-V).

REFERENCE BOOKS

4. The essential guide to user interface design, Wilbert 0 Galitz, Wiley DreamTech.
5. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
6. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.

I Year M.Tech CSE

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INFORMATION SYSTEMS FOR ENGINEERS

(Open Elective-2)

Course Outcomes: At the end of this course, the student would be able to

6. Understand the basic concepts of Information Systems applicable to Engineers.
7. Study the design, development and security of Information Systems.
8. Learn the various modules in ethical and social issues while using Information Systems.
9. Understand issues in data security.
10. Analyse ethics in information systems.

UNIT I – INTRODUCTION

Introduction to Information Technology - Need for information technology; Information Systems: Concepts and overview of information systems; Components of information Systems, Types of Information systems.

UNIT II - SYSTEMS ANALYSIS AND DESIGN

System Analysis : System and system concepts, classification of information System, SDLC framework. System Design-Deterministic System and Probabilistic System, Basic elements of business organization, Business system and objectives.

UNIT III – DATABASES AND INFORMATION MANAGEMENT

Database Management Systems for information Systems: File Organization concepts, Database Management systems, capabilities of DBMS, Database Design, Challenges of Big Data.

UNIT IV - SECURITY IN INFORMATION SYSTEMS

Information Systems Security –System Vulnerability and abuse – improve Business value of security & control using various technologies – framework security and control –recent technologies and tools for protecting information resources.

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Ethical and Social Issues in Information Systems – ethics in an information society – moral dimensions of Information Systems.

TEXT BOOKS:

1. Kenneth C. Laudon & Jane P.Laudon, "Management Information Systems" Managing the Digital Firm-Twelfth Edition, Pearson.

2. Gerald V.Post David L. Anderson, "Management Information System-Solving Business Problems with Information Technology" Tata McGraw Hill Publishing Co. ltd, New Delhi

REFERENCES:

1. Management Information Systems by CSV Murthy, HIM publishers

2. Raymond Meleod, JR "Information Systems" Mac Millan Publishing Co. ltd4th Edition.

I Year M.Tech. CSE

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E – COMMERCE
(Open Elective-3)

Course Outcomes:
At the end of this course, the student would be able to:

1. Identify the anatomy of E-Commerce applications and its process models.
2. Categorize different Electronic payment systems.
3. Examine Supply chain Management.
4. Analyze the various marketing strategies for an online business.
5. Design strategies for E-Commerce Catalogues.

UNIT-I
Electronic Commerce
Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications and E-Commerce organization applications, Consumer Oriented Electronic commerce, Mercantile Process models.

UNIT-II
Electronic Payment Systems
Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce – EDI, EDI Implementation, Value added networks.

UNIT-III
Intra Organizational Commerce – work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT-IV
Corporate Digital Library – Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing – Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT-V
Consumer Search and Resource Discovery
Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia – key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK
1. Frontiers of electronic commerce — Kalakata, Whinston, Pearson.

REFERENCES
1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce Gary P.Schneider — Thomson.