Vidya Jyothi Institute of Technology  
(An Autonomous Institution)  
Azimnagar Gate, G.B. Post, Hyderabad - 500 075, Telangana.  
Department of Computer Science & Engineering

MINUTES OF THE BOARD OF STUDIES

Meeting held on 13th July 2021 at 2.30PM in the online mode

The following members were present in the online meeting:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Member</th>
<th>Designation</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dr. B. Vijayakumar, Professor &amp; Head, CSE, VJIT</td>
<td>Chairman</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Dr. O.B.V. Ramaanalah, Professor, CSE, JNTUH</td>
<td>JNTUH Nominee</td>
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<tr>
<td>3.</td>
<td>Dr. V. Vijaya Kumar, Professor &amp; DEAN, CSE&amp;IT, AGI</td>
<td>Member</td>
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<tr>
<td>4.</td>
<td>Dr. Swamy Das, Professor &amp; Head, CSE, CBIT</td>
<td>Member</td>
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<tr>
<td>5.</td>
<td>Dr. K.V.Ranga Rao, Professor &amp; Head, CSE, NGIT</td>
<td>Member</td>
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<tr>
<td>6.</td>
<td>Mr. Subramanyam, Delivery Head, TCS</td>
<td>Member</td>
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<tr>
<td>7.</td>
<td>Dr. J. Sasikiran, Professor, CSE, LIET</td>
<td>Member</td>
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<td>8.</td>
<td>Dr. D Aruna Kumari, Professor, CSE, VJIT</td>
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<tr>
<td>9.</td>
<td>Dr. Ravi Mathey, Professor, CSE, VJIT</td>
<td>Member</td>
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<tr>
<td>10.</td>
<td>Mr. B. Srinivasulu, Head, IT, VJIT</td>
<td>Member</td>
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<tr>
<td>11.</td>
<td>Dr. Siddhartha Ghosh, Professor &amp; Head, AI, VJIT</td>
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<tr>
<td>12.</td>
<td>Dr. K. Ramesh Babu, Professor, CSE, VJIT</td>
<td>Member</td>
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</table>
Vidya Jyothi Institute of Technology
(An Autonomous Institution)
Azimnagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

Department of Computer Science & Engineering

Resolutions

Item No. 1 : Approval of B.Tech. (CSE) II, III and IV Year Course Structure of R-20 regulations
The chairman of BoS presented a detailed course structure of B.Tech.(CSE ) II, III and IV Years under R-20 regulations.

Resolution 1 : The members after thorough discussion approved the course structure of B.Tech. (CSE ) II, III and IV Years. The details of the course structure are given in Annexure -1
Noted and Approved.

Item No. 2 : Approval of B.Tech. (CSE) II, III and IV Year Syllabi of R-20 regulations
The Chairman presented a detailed syllabi of B.Tech.(CSE ) II, III and IV Years

Resolution 2 : The members after thorough discussion approved the syllabi of B.Tech. (CSE ) II, III and IV Years. The details of the syllabi approved are given in Annexure -2
Noted and Approved.

Item No. 3 : Approval of B.Tech. (CSE ) Fast track Curriculum scheme offered to B.Tech III and IV Year students of R-20 regulations
The chairman of BoS presented the salient features of B.Tech.(CSE ) Fast track Curriculum scheme (FTCS) offered to B.Tech. (CSE ) III and IV Years students.

Resolution 3 : The members after thorough discussion approved the Fast track Curriculum scheme offered to B.Tech. (CSE ) III and IV Years students and the details are given in Annexure – 3
Noted and Approved.

Item No. 4 : Approval of syllabi of B.Tech. (CSE ) III and IV Year Open Elective Courses of R-20 regulations
The chairman of BoS presented the details of open elective courses offered to other than CSE students.

Resolution 4 : The members after thorough discussion approved the syllabi of Open Elective courses of B.Tech. (CSE ) III and IV Years.
The details of the syllabi are given in Annexure -4
Noted and Approved.

Item No. 5 : Approval of the courses offered by CSE department to other departments
1. Object-Oriented Programming through Java course along with the syllabus offered to II Year of ECE Department under R-20 regulations
2. Essentials of Computer Networks course along with the syllabus offered to III Year of EEE Department under R-20 regulations
The Chairman presented detailed syllabi of above said courses that are offered to ECE & EEE Departments under R-20 regulations.

Resolution 5: The members after thorough discussion approved the courses offered to ECE & EEE department and the details are given in Annexure – 5.

**Noted and Approved**

Item No.6: The BoS Chairman is also authorized to add or remove professional/Open elective courses with the approval of internal BoS members and through mail confirmation from the external BoS members.

Resolution 6: The BoS Members have agreed to authorize the BoS Chairman to add or remove professional/Open elective courses with the approval of internal BoS members and through mail confirmation from the external BoS members.

**Noted and Approved**

Item No.7: To approve the Panel of examiners

The BoS Chairman emphasized the necessity of Panel of Examiners. Their services will be utilized in the preparation of End-Semester Question paper(s), Evaluation of End-Semester Examination Answer Scripts. They will be paid remuneration as per the recommendations of College Finance Committee.

Resolution 7: The BoS Chairman is authorized to prepare the Panel of examiners for all the B.Tech (CSE) courses in consultation with the senior faculty members of the dept. The same may be presented to the Examination branch (Autonomous) for further processing.

**Noted and Approved.**

Suggestions:

1. As per the AICTE modern Curriculum the more weightage should be given to the Laboratory courses. In this context the BoS members advised to follow the 5 theory and 3 laboratory courses per semester for the upcoming regulations.

2. The BoS Members also advised to give the choice to the fastrack students to opt IV Year II Semester Courses as NPTEL Courses.

Signatures of the Members Present:

<table>
<thead>
<tr>
<th>Dr. B. Vijayakumar</th>
<th>Dr. O.B.V. Ramanaiah</th>
<th>Dr. V. Vijaya Kumar</th>
<th>Dr. Swamy Das</th>
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<td>Mr. B. Srinivasulu</td>
<td>Dr. Siddhartha Ghosh</td>
<td>Dr. K. Ramesh Babu</td>
</tr>
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# B.TECH(CSE) FIRST YEAR COURSE STRUCTURE

## B.Tech I Year I Semester

<table>
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<tr>
<th>S. No</th>
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<th>Course Title</th>
<th>L</th>
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### B.TECH(CSE) SECOND YEAR COURSE STRUCTURE

#### B.Tech II Year I Semester

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#### B.Tech II Year II Semester

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### B.TECH (CSE) THIRD YEAR COURSE STRUCTURE

#### B.Tech III Year I Semester

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<td>Personality Development &amp; Behavioural Skills</td>
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**Total**                                                                 | 20 | 0 | 4 | 21     |

#### B.Tech III Year II Semester

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**Total**                                                                 | 20 | 0 | 4 | 21     |

[Signature]
# B.TECH (CSE) FOURTH YEAR COURSE STRUCTURE

## B.Tech IV Year I Semester

<table>
<thead>
<tr>
<th>S. No.</th>
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<th>Course Title</th>
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## B.Tech IV Year II Semester

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Annexure -2
## B.TECH (CSE) SECOND YEAR COURSE STRUCTURE & SYLLABUS

### B.Tech II Year I Semester

<table>
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<tr>
<th>S. No.</th>
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<td>Database Management Systems Lab</td>
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<tr>
<td>9</td>
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<td>Environmental Science/ Gender Sensitization/ Cyber Law</td>
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</table>
DATA STRUCTURES

B.Tech II Year I Semester

Course Outcomes:

At the end of the course student would be able to
1. Understand the concepts of Stacks and Queues with their applications.
2. Analyze various operations on Binary trees.
3. Examine of various concepts of binary trees with real time applications.
4. Analyze the shortest path algorithm on graph data structures.
5. Outline the concepts of hashing, collision and its resolution methods using hash functions.

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, Representation of Trees using Arrays and Linked lists (advantages and disadvantages), Tree Traversal, Representation of Algebraic expressions, Threaded Binary Trees.

UNIT - III:
Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Operations on BST, Representation and advantages of AVL Trees, algorithms & operations on AVL Trees, Multi-way trees, 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 algorithms. Spanning Tree, Minimum Spanning Trees- Prim’s Algorithm, Kruskals Algorithm, Dijkstra Algorithm.

UNIT - V:

Text Books:

Reference Books:
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

B.Tech II Year I Semester

Course Outcomes:
At the end of the course student would be able to
1. Analyze elementary mathematical arguments.
2. Apply discrete mathematics problems that involve computing permutations and combinations of a set.
3. Analyze problems involving recurrence relations & generating functions.
4. Demonstrate various operations on discrete structures.
5. Apply graph theory models to solve the problems of networks.

UNIT - I:

UNIT - II:

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.

UNIT - V:

Text Books:
Reference Books:
PYTHON PROGRAMMING

B.Tech II Year I Semester

Course Outcomes:
At the end of the course student would be able to
1. Implement the programming skills in core Python.
2. Apply built-in methods of strings, sequences and regular expressions in real time applications
3. Understand the object oriented programming techniques.
4. Implement the concepts of inheritance and polymorphism.
5. Develop file manipulation and exception handling skills

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, Build-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, 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

Reference Books
1. James Payne, Beginning Python using Python 2.6 and Python 3
2. Kenneth A. Lambert, Fundamentals of Python
3. Charles Dierach, Introduction to Computer Science using Python
DATA STRUCTURES & PYTHON PROGRAMMING LAB

B.Tech II Year I Semester

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. Apply Hashing techniques in real world applications
4. Implement oops concepts in Python
5. Develop Programs on modules and Packages
6. Design Programs that handle errors

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
10. Program to implement hash table using linear and quadratic probing.

Part-B
Exercise - I
   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 - II
   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 - III
   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 Strings, String Operations and Regular Expressions
Exercise - IV
   a) Write a Program to implement Class and Object
   b) Write a Program to implement Static and Instance methods, and Abstract Classes.

Exercise - V
   a) Write a program to implement Inheritance
   b) Write a program to implement Polymorphism

Exercise - VI
   a) Write a program to implement Files
   b) Write a program to implement Exception Handling.
DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech II Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Analyze the efficiency of algorithms
2. Develop algorithms divide & conquer, greedy and related problems
3. Examine the performance of Dynamic programming
4. Explain performance of algorithm using Backtracking
5. Analyze NP-Hard and NP-Complete problems

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

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 coloring, 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, Satisfiability problem, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:
References:
1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearsoneducation.
COMPUTER ORGANIZATION

B.Tech II Year II Semester

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 microprocessor instructions to write simple programs in assembly language.
4. Classify various modes of data transfers.
5. Outline various interconnection structures of multiprocessors.

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:

Reference Books:
JAVA PROGRAMMING

B.Tech II Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Understand OOP concepts to apply basic Java constructs.
2. Analyze different forms of inheritance and usage of Exception Handling
3. Understand the different kinds of file I/O Multithreading in complex Java programs, and usage of Container classes
4. Contrast different GUI layouts and design GUI applications
5. Construct a full-fledged Java GUI application and Applet with database connectivity.

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 me /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: Linked List, 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, Checkbox Group, 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 ManagerBorder, Grid, Flow, Card and Gridbag.
Applets Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets.
JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

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.
SOFTWARE ENGINEERING

B.Tech II Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Outline the framework activities for a given project.
2. Examine Right process model for a given project.
3. Analyze various system models for a given Context.
4. Understand various testing techniques for a given project.
5. Identify various risks in project development.

UNIT I:
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:
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 techniques, Validation testing, System testing.
Product Metrics: Software Quality, Metrics for requirements Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics, component design metrics, Metrics for source code, Metrics for Testing, Metrics for maintenance.
UNIT V:
Risk Management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Text Books:

References:
DATABASE MANAGEMENT SYSTEMS

B.Tech II Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Understand the concepts of Entity-Relationship Model for enterprise level databases.
2. Analyze the database and provide restricted access to different users of database.
3. Understand various Normal forms to carry out schema refinement.
4. Analyze various Concurrency control protocols.
5. Understand working principles of Recovery algorithms

UNIT-I:

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.

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, BCNF.

UNIT-IV:
Concurrency Control: Lock-Based Protocols, Deadlock Handling, Timestamp-Based Protocols, Validation based protocols.
UNIT-V:

Text Books:

Reference Books:
3. C.J. Date Introduction to Database Systems Pearson Education
JAVA PROGRAMMING LAB

B.Tech II Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Apply basic Java constructs and OOP to solve mathematical problems.
2. Apply Inheritance in Java programs and Analyze Exception Handling code
3. Implement File input/output and multithreading concepts in advanced Java programs.
4. Design different GUI applications using GUI layouts.
5. Apply Applet development and Database connectivity to build GUI applications

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:
1. Write a program to illustrate different types of inheritances.
2. Write a java program to illustrate Method overriding.
3. Write a java program to demonstrate the concept of polymorphism (Dynamic Method Dispatch).
4. Write a program to demonstrate final keyword.

Week 4 & 5:
1. Write a program to illustrate the use of creation of packages.
2. Write a java program to handle the situation of exception handling using multiple catch blocks.
3. Write a program to implement the concept of User defined Exceptions.

Week 6 & 7:
1. Write a program to illustrate Multithreading and Multitasking.
2. Write a program to illustrate thread priorities.
3. Write a program to illustrate Synchronization

Week 8 & 9:
1. Write a program to implement StringTokenizer.
2. Write a program to read one line at a time, and write it to another file.

Week 10 & 11:
1. Write a program to illustrate Event Handling (keyboard, Mouse events)
2. Write a program to illustrate applet life cycle and parameter passing.

Week 12:
1. Write a program to develop a calculator application using AWT.

Week 13:
1. Write a program to illustrate JDBC.
DATABASE MANAGEMENT SYSTEMS LAB

B.Tech II Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Use the SQL commands such as DDL and DML statements to perform different operations.
2. Apply various integrity constraints on the database tables.
3. Apply Joins to retrieve the information from multiple tables.
4. Design different Views of tables for different users.
5. Design and implement a PL/SQL program which includes procedures, functions, 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_date: 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.
   j. Create a view which lists the daily sales date wise for the last oneweek

2. Database Schema for a Student Library scenario
   Student (Stud_no :integer, Stud_name: string)
   Membership (Mem_no: integer, Stud_no: integer)
   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 Booknames
   e. List the details of students who borrowed book whose author is KORTH.
   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-payscenario
   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 departmentwise.
   d. List all the employee names who joined after particular date.
   e. List the details of employees whose basic salary is between 50,000 and 1,00,000
   f. Give a count of how many employees are working in each department.
   g. Give a name of the employees whose net salary > 1,00,000.
   h. List the details for an employee_id=5
   i. Create a view which lists out the emp_name, department, basic, deductions, net salary.
   j. Create a view which lists the emp_name and his net salary.

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 Legend!
   f. Give a count of how many cassettes have been borrowed by each customer.
   g. Give a list of cassettes which has been taken by the Customer with mem_no as 5
   h. List the cassettes issues for today.
   i. Create a view which lists out 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 daywise.
   e. Give a count of how many machines have been allocated to the 'CSE' 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 –Monday.
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, day of week.
j. Create a view which lists the machine allotment details for–Thursday.

6. Create a procedure to find reverse of a given number.
7. Create a procedure to update the salaries of all employees as per the given data.
8. Create a procedure to demonstrate IN, OUT and INOUT parameters.
9. Create a function to check whether given string is palindrome or not.
10. Create a function to find sum of salaries of all employees working in depart number 10.
11. Create a trigger before/after update on employee table for each row/statement.
12. Create a trigger before/after delete on employee table for each row/statement.
13. Create a trigger before/after insert on employee table for each row/statement.
B.TECH (CSE) THIRD YEAR COURSE STRUCTURE & SYLLABUS

B.Tech III Year I Semester

<table>
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### III Year – I Semester (Fast Track Curriculum Scheme)

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FORMAL LANGUAGES AND AUTOMATA THEORY

B.Tech III Year I Semester

Course Outcomes:
At the end of the course, student will be able to:
1. Appreciate the role and structure of Language theory.
2. Design of regular expressions for language constructs and conversions of NFA and DFA.
3. Demonstrate the derivations and properties of various CFG and Regular grammars.
4. Design of PDA for the given CFG.
5. Appreciate the role of the Turing machine as computational and universal machine.

Unit -I:
Fundamental concepts: Strings, Alphabets, Language operations, Regular Expressions, Regular Languages: Finite automata, Types of finite automata (FA)-Non deterministic Finite Automata (NFA), Deterministic Finite Automata (DFA), NFA with ε-Moves, regular expression representation; Regular expressions to NFA; NFA with ε-Moves to NFA without ε-Moves; NFA to DFA Conversions; Minimization of DFA (Proofs Not Required)

Unit -II:
DFA with outputs: Moore and Melay machines, Pumping Lemma for Regular Sets: Closure properties of Regular Sets (Proofs Not Required); Context Free Grammars (CFG), Right most, Left most –derivations, Ambiguity, Parse Trees, Minimization of CFG: Elimination of useless symbols and unit productions, Chomsky Normal Forms (CNF).

Unit -III:
Left recursion and Elimination of left recursion in CFG, Greibach Normal Form, Push Down automata (PDA), Types of PDA, Design of a PDA for a given CFG. (Proofs Not Required)

Unit -IV:
Regular Grammars (RG), Design of DFA for a given RG: Right linear and left linear Grammars and conversions; Definition of Context Sensitive Grammar (CSG) and Linear bounded automata (LBA) (Proofs Not Required).

Unit -V:
Definition of unrestricted Grammar and Turing Machine (TM); Chomsky hierarchy on Languages, Grammars and recognizers; Design of TM as recognizer; Types of TM: Computational problems of TM with multiple tracks; Decidability Problem; Churches hypothesis (Proofs Not Required)

Text Books:
Reference Books:
COMPUTER NETWORKS

B.Tech III Year I Semester

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. Recommend transport protocol for the given scenarios.
5. Identify the protocols and functionalities in application layer

UNIT - I:
Physical Layer: Guided transmission media, wireless transmission media.

UNIT - II:
Data Link Layer Design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol.
Multi Access Protocols ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer CSMA/CD with Binary Exponential Back off, 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, routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Count to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control
Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP

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

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

REFERENCE BOOKS:
OPERATING SYSTEMS

B.Tech III Year I Semester

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:

UNIT - II:

UNIT - III:

UNIT - IV:

UNIT - V:
Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery.

TEXT BOOKS:

REFERENCES BOOKS:
WEB TECHNOLOGIES

B.Tech III Year I Semester
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.

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:

TEXT BOOKS
REFERENCE BOOKS

2. Java Script, D Flanagan, O'Reilly, SPD
3. Java Server Pages, Hans Bergsten, SPD O'Reilly
PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective-1)

III Year B.Tech. CSE – I Semester

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:

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 smalltalk, 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:

REFERENCE BOOKS:
3. LISP Patric Henry Winston and Paul Horn Pearson Education.
LINUX PROGRAMMING
(Professional Elective-1)

B.Tech III Year I Semester

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:

UNIT - II:
Shell programming with Bourn 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 and Directories- File Concept, File types, File System Structure, Inodes, 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.

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. 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, popen and pclose library functions. Message Queues- APIs for message queues Semaphores- APIs for semaphores Shared Memory- APIs for shared memory. Sockets- Introduction to Sockets, basic functions of Socket.
TEXT BOOKS:

REFERENCE BOOKS:
SOFTWARE PROJECT MANAGEMENT
(Professional Elective-1)

B.Tech III Year I Semester

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:

UNIT II:
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:
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. 
Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R)
TEXT BOOKS:

REFERENCE BOOKS:
COMPUTER GRAPHICS
(Professional Elective - 1)

B.Tech III Year I Semester

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.
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, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT-II:
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-spline 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 BOOKS

REFERENCE BOOKS
B.Tech III Year I Semester

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. Write Programs on File allocation strategies
4. Implement various algorithms for error detection and correction
5. Implement Algorithms on Shortest path routing
6. Write a program for congestion control

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 implement Banker's algorithm for deadlock avoidance.
Week 7: Implement the data link layer framing methods such as character stuffing and bit stuffing.
Week 8: Implementation of hamming code algorithm
Week 9: Implement on a data set of characters the three CRC polynomials – CRC 12, CRC and CCIP.
Week 10: Implement Dijkstra's algorithm to compute the Shortest path through a graph.
Week 11: Take an example subnet of hosts. Obtain broadcast tree for it.
Week 12: Write a program for congestion control using leaky bucket algorithm.
WEB TECHNOLOGIES LAB

B.Tech III Year I Semester
Course Outcomes:
At the end of the course, student will be able to:
1. Design static web pages that perform client side authentication.
2. Understand XML data representation.
3. Create dynamic web application using PHP and access database.
4. Implement sessions in web applications
5. Design dynamic 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 the fields 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 information from the XML document using (a) DOM Parser and (b) SAX parser

Week 8: Create a PHP application that reads request parameters from the registration page created in the first experiment and stores in the database.

Week 9: Create a PHP application program for authenticating users for the above program using sessions.

Week 10: Installation and configuration of Tomcat and deploy a simple “Hello World” servlet.
**Week 11:** Write a servlet that reads request parameters from the registration page created in the first experiment and stores in the database.

**Week 12:** Write a servlet program for authenticating users for the above program.

**Week 13:** Implement the following session handling techniques using servlets:

i) Cookies

ii) Hidden form field

iii) HttpSession

iv) URL Rewriting

**Week 14:** Create a JSP application that reads request parameters from the registration page created in the first experiment and stores in the database using Java Beans.

**Week 15:** Create a JSP application for authenticating users for the above program
COMPILER DESIGN

B.Tech III Year II Semester

Course Outcomes:
At the end of the course student would be able to
1. Formulate tokens for various programming languages.
2. Apply principles of parsing techniques to do syntax analysis.
3. Formulate semantic rules to do semantic analysis.
4. Apply optimization techniques on the intermediate code.
5. Generate the target code.

Unit I:
Introduction to Compilers: Structure of Compiler-Phases of Compiler, Symbol Table Management, Grouping of Phases into Passes, Compiler Vs Interpreter.
Lexical Analysis: Role and need of Lexical Analyzer, Input Buffering, Regular expressions for identifiers, Signed numbers etc., A Language for specifying Lexical Analyzer, Lexical phase errors.

Unit II:
Basic Parsing Techniques: Parsers, Top-Down parsing, Predictive parsers and construction of predictive parsing and LL (1) parser table, LL (1) grammar.

Unit III:
Construction of efficient Parsers: Introduction to Bottom Up parsing, shift reduceparser,LR Parsers, Canonical collection of LR(0) items, construction of SLR parsing tables, Construction of canonical LR(0) parsing tables, Construction of LALR parsing tables, Comparison of SLR, LALR and CALLP parsers, Comparison of Top down and Bottom up parsers.

Unit IV:
Syntax Directed Translation: Syntax Directed Translation schemes, Intermediate codes, Postfix notation, Three Address code, Quadruples and triples.
Run-Time Environments: Storage allocation strategies, Stack allocation of space, Access to non-local names. Symbol table: Contents of Symbol table, Data Structures for symbol tables, representing scope information

Unit V:
Code Optimization: Principal sources of optimization, Loop optimization, Copy Propagation, Dead code elimination, Redundant sub expression elimination.
Text Book:

Reference Books:
DATA WAREHOUSING & DATA MINING

B.Tech III Year II Semester

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 warehousing 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 Books:
1. Data Mining: Concepts and Techniques by Jiawei Han, Micheline Kamber and Jian Pei
   Morgan Kaufmann publishers 2nd edition

References:
2. Data Warehousing in the Real World Sam Aanhory & Dennis Murray, Pearson Edn
   Asia, 2002.
ARTIFICIAL INTELLIGENCE

B.Tech III Year II Semester

Course Outcomes:
At the end of the course, student will be able to:
1. Understand the evolution and present status of AI
2. Understand different searching algorithms used in AI
3. Analyze different knowledge representation techniques.
4. Demonstrate probabilistic reasoning & uncertain knowledge
5. Apply various learning techniques to AI systems for learning process.

Unit – I:
Concept of AI, History, Current Status, Scope, Intelligent Agents, Environments, Problem Formulations, Review of Tree and Graph Structures, State Space Representation, Search Graph and Search Tree.

Unit – II:
Uninformed and Informed Search Algorithms: Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search: Generate & Test, Hill Climbing, Best first search, A* algorithm, Game Search, Alpha-Beta Pruning Genetic Algorithm

Unit – III:

Uncertain Knowledge and reasoning: Acting under Uncertainty, Basic Probability Notation, Inference Using Full Joint Distribution, Independence, Baye’s Rule and Its use.


Unit – IV:

Unit – V:

Text Books:
Reference Books:

OBJECT ORIENTED ANALYSIS & DESIGN
(Professional Elective-2)

B.Tech III Year II Semester

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, use case diagrams and activity diagrams for a given project
4. Design State diagrams involving processes and threads
5. Apply the concept of architectural design for deploying the code for software

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-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:

REFERENCE BOOKS:
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.
INFORMATION SECURITY
(Professional Elective-2)

B.Tech III Year II Semester

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.

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

UNIT - V:

TEXT BOOKS:
REFERENCE BOOKS:
SOFTWARE TESTING METHODOLOGIES
(Professional Elective-2)

B.Tech III Year II Semester

Course Outcomes:
At the end of this course, the student would be able to
1. Understand the purpose of Software testing.
2. Discuss various testing techniques and able to prepare the test cases for specific requirements.
3. Understand transaction and data flow testing.
4. Construct the test plans and validate the test plan.
5. Understand the testing policies and standards.

UNIT - I:

UNIT-II:
Test Case Design Strategies, Using Black Box Approach to Test Case Design: Requirements based testing, positive and negative testing, Boundary Value Analysis, Logic based Testing, Equivalence Class Partitioning, State-transition testing, Domain Testing, Using White Box Approach to Test design: code functional testing, Coverage and Control Flow Graphs, Covering Code Logic, Paths and their Role in White-box Based Test Design.

UNIT-III:

UNIT-IV:
Test Management: People and organizational issues in testing, organization structures for testing teams, testing services, Test Planning Test Plan Components, Test Plan Attachments, Locating Test Items, test management, test process, Reporting Test Results, The role of three groups in Test Planning and Policy Development, Introducing the test specialist, Skills needed by a test specialist, Building a Testing Group.

UNIT-V:
Test Automation: Skills needed for automation, scope of automation, design and architecture for automation, requirements for a test tool, challenges in automation, Test metrics and measurements, project, progress and productivity metrics.

TEXT BOOKS:
REFERENCE BOOKS:
INFORMATION RETRIEVAL SYSTEMS
(Professional Elective – 2)

B.Tech III Year II Semester

Course Outcomes
1. Understand the concepts of information system models
2. Ability to use various retrieval utilities for improving search
3. Analyze the crossing language barrier and learn about crossing language information retrieval.
4. Evaluate indexing and compressing documents to improve space and time efficiency.
5. Understand issues in web search, structured and unstructured data.

UNIT-I:
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

UNIT-II:
Retrieval Utilities: Relevance feedback, Clustering, N-grams, Regression analysis, Thesauri.

UNIT-III:

UNIT-IV:
Efficiency: Inverted index, Query processing, Signature files, Duplicate document detection.

UNIT-V:
Integrating Structured Data and Text: A Historical progression, Information retrieval as a relational application, Semi-structured search using a relational schema
Distributed Information Retrieval: A Theoretical model of distributed retrieval Web search.

TEXT BOOK:

REFERENCE BOOKS:
1. Soumen Chakrabarti, Mining the Web : Discovering Knowledge from Hypertext Data, Morgan—Kaufmann Publishers, 2002
DATA MINING & CASE TOOLS LAB

B.Tech III Year II Semester

Course outcomes:
At the end of the course, student will be able to:
1. Demonstrate frequent pattern algorithms
2. Explore Weka environment
3. Apply data mining techniques for realistic data
4. Design various UML diagrams for ATM application
5. Design Unified Library application
6. Explore 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 machine. 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 envelopes 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.
# B.TECH (CSE) FOURTH YEAR COURSE STRUCTURE & SYLLABUS

## B.Tech IV Year I Semester

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## B.Tech IV Year II Semester

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<td>Major Project</td>
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</table>

**Total** 6 0 24 20

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These tables outline the course structure and syllabus for the B.Tech IV Year I and II Semesters, listing courses, their codes, titles, lecture (L), theory (T), practical (P), and total credits. The tables also provide a total for credits across all courses for each semester.
### B.Tech IV Year – I Semester (Fast Track Curriculum Scheme)

<table>
<thead>
<tr>
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**Total**: 18 L 0 T 4 P 23 Credits

### B.Tech IV Year – II Semester (Fast Track Curriculum Scheme)

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</table>

**Total**: 0 L 0 T 24 P 14 Credits
MOBILE APPLICATION DEVELOPMENT

B.Tech IV Year I Semester

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 into Android Market

UNIT I:
JAVA FX TECHNOLOGY FOR RICH CLIENT APPLICATIONS
Introduction: Introduction to mobile application development, Android platform features and architecture, versions, comparison added features in each version, 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.java file, Android manifest file, creating a simple application.

UNIT II:
ANDROID UI DESIGN
GUI for Android: Introduction to activities, activities life-cycle
Intent: intent object, intent filters, linking activities.
Views and View Groups: Basic views, picker views, adapter views, Menu, App Bar etc, basics of screen design, different layouts, App widgets.
Material design: 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
Broadcast receivers: LocalBroadcastManager, Dynamic broadcast receiver, System Broadcast. Pending Intent, Notifications
Telephony Manager: Sending SMS and making calls.

UNIT V:
Location based services: Displaying Maps, Obtaining the Maps API Key, Displaying the zoom control, changing views, navigating to a specific location, Getting the location that was touched, Geocoding and Reverse Geocoding, Getting Location Data, Monitoring a Location

TEXT BOOKS:
2. J.F.DiMarzio's, "Android 4 Application Development"

REFERENCE BOOKS:
CLOUD COMPUTING

IV Year B.Tech. CSE – I Semester

Course Outcomes:
At the end of this course, the student would be able to:
1. Understand different Cloud Services
2. Analyze different cloud deploy and service models.
3. Understand various enterprise applications in cloud computing
4. Understand and apply the virtualization concepts
5. Understand the data security mechanism and SLA management in cloud.

UNIT - I:

UNIT II:
Migration into a Cloud: Introduction, Broad Approaches to Migrating into the Cloud, the Seven-Step Model of Migration in to a Cloud.

UNIT - III:

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.

UNIT - V:

TEXT BOOK:

REFERENCE BOOKS:

BIG DATA ANALYTICS  
(Professional Elective - 3)

B.Tech IV Year I Semester

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

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:
REFERENCE BOOKS:


INTERNET OF THINGS (IoT)
(Professional Elective - 3)

B.Tech IV Year 1 Semester

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 BOOKS:
1. Internet of Things a Hands-on Approach, Arshdeep Bahga and Vijay Madisetti,
REFERENCE BOOKS:

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

R PROGRAMMING
(Professional Elective - 3)

B.Tech IV Year I Semester

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:

Unit – II:

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

Unit – IV:

Unit-V:
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 BOOK:

REFERENCE BOOKS:
3. Avril Coghlan, A Little Book of R For Time Series, Release 0.2.
INTRODUCTION TO DATA SCIENCE
(Professional Elective – 3)

B.Tech IV Year I Semester

Course Outcomes:
At the end of the course, students will be able to
1. Understanding the fundamental concepts of Data Science
2. Understanding how data is collected, managed and stored for data science
3. Understand the real-world applications of data scientists
4. Visualize and present the inference using various tools
5. Implement data collection and management scripts using MongoDB

UNIT – I
Introduction to core concepts and technologies:
Introduction to Data Science, Terminology, Data Science Process, Data Science Toolkit, Types of Data, Example Applications, Data Science Tools, Applications of Data Science

UNIT – II
Data Collection and Management:
Sources of data, Data Collection and APIs, Exploring and Fixing Data, Data Storage and Management, Using Multiple Data Sources

UNIT-III
Data Analysis:

UNIT-IV
Data Visualization:
Types of data Visualization, Data for Visualization: Data Types, Data Encodings, Retinal Variables, Mapping Variables to Encodings, Visual Encodings

UNIT-V
Different Technologies for Visualization, Bokeh (Python), Recent Trends in Various Data Collection and Analysis Techniques, Various Visualization Techniques, Application Development methods of used in Data science

TEXT BOOKS:
REFERENCE BOOKS:
ADVANCED DATABASES
(Professional Elective - 4)

B.Tech IV Year I Semester

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.
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.

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:
REFERENCE BOOKS:

1. Distributed Databases Stefano Ceri and Willipse Pelagatti, McGraw Hill.
BLOCKCHAIN TECHNOLOGIES
(Professional Elective - 4)

B.Tech IV Year I Semester

Course Outcomes:
At the end of the course student would be able to
1. Understand the Cryptography, and Block Chain
2. Discuss about Generic elements of blockchain
3. Demonstrate various methods and routes of Decentralization
4. Analyze the concepts of Bitcoin
5. Apply Block chain in Real time scenario.

Unit I:
Introduction to Cryptography and Blockchain: Symmetric Cryptography, Stream Ciphers, Block Ciphers, Hash functions: Design of SHA-256, Merkle trees, Patricia trees, Distributed hash tables, Digital signatures. The Growth of Block Chain Technology: Electronic cash, Block Chain

Unit II:
Generic Elements of Blockchain, Blockchain working and Accumulation blocks, Benefits and Limitations of blockchain, Tiers of blockchain technology, Features of blockchain, Types of block chain, Consensus, CAP Theorem and block chain.

Unit-III:
Decentralization: Decentralization using block chain, Methods of Decentralization, Routes to Decentralization, Block chain and full Ecosystem Decentralization, Smart Contracts, Platforms for Decentralization.

Unit IV:
Introducing Bitcoin: Digital keys and addresses, Transactions, Block Chain, Mining, the Bitcoin Network.

Unit V:

TEXT BOOKS:

REFERENCE BOOKS:
MACHINE LEARNING
(Professional Elective - 4)

B.Tech IV Year I Semester

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:

REFERENCE BOOKS:
3. Chris Bishop, Neural Network for, Pattern Recognition, Oxford University Press. 1995
IMAGE PROCESSING
(Professional Elective - 4)

B.Tech IV Year I Semester

Course Outcomes:
After completion of the course, student would be able to:
1. Understand Digital image fundamentals,
2. Program Image Transformations,
3. Design Color Image Processing and Restoration,
4. Implement Image segmentation techniques and
5. Program Image Compression techniques.

UNIT-I:

UNIT-II:

UNIT-III:

UNIT-IV:
Image segmentation Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

UNIT-V:
Image compression Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression.

TEXT BOOKS:

REFERENCE BOOKS:
1. Image Processing with Scilab and Image Processing Design Toolbox; Dr. Eng. (J) Harald Galda, 2011.
MOBILE APPLICATION DEVELOPMENT LAB

B.Tech IV Year I Semester

Course Outcomes:
At the end of this course, the student would be able to:
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.
BIG DATA ANALYTICS LAB
(Professional Elective - 3 Lab)

B.Tech IV Year I Semester

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
INTERNET OF THINGS LAB
(Professional Elective - 3 Lab)

B.Tech IV Year I Semester

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:
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:

Week 8:

Week 9 & 10:
11. Introduction to Open Web Services for IoT
12. Experiments with Open Web Services for IoT:
   a. M2M Labs
   b. The Thing Box
   c. The Thing System
   d. Node-RED

Week 11:

Week 12:

Week 13:
15. Build a web server for IoT Management
R PROGRAMMING LAB
(Professional Elective–3 LAB)

B.Tech IV Year I Semester

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. Analyze 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

Week-13:
Experiments on Lapply, Sapply and Apply functions

Week-14:
Generate different Charts and Graphs using R
Course Outcomes:
1. To make students understand learn about a Data Science—Python Programming, way of solving problems.
2. To teach students to write programs in Python to solve problems.
3. Demonstrate the usage of built-in objects in Python.
4. Analyze the significance of Python program development environment by working on real world examples
5. Implement numerical programming, data handling and visualization through NumPy, Pandas and Matplotlib modules.

1. INTRODUCTION TO PYTHON
Structure of Python Program-Underlying mechanism of Module Execution-Branching and Looping-Problem Solving Using Branches and Loops-Functions- Lists and Mutability- Problem Solving Using Lists and Functions

Week 1:
1. Demonstrate usage of branching and looping statements
2. Demonstrate Recursive functions
3. Demonstrate Lists

Week 2:
SEQUENCE DATATYPES AND OBJECT-ORIENTED PROGRAMMING
Sequences, Mapping and Sets- Dictionaries- -Classes: Classes and Instances-Inheritance- Exceptional Handling-Introduction to Regular Expressions using “re” module.
Lab Exercises
1. Demonstrate Tuples and Sets
2. Demonstrate Dictionaries
3. Demonstrate inheritance and exceptional handling
4. Demonstrate use of “re”.

Week 3:
USING NUMPY
Basics of NumPy-Computation on NumPy-Aggregations-Computation on Arrays-Comparisons, Masks and Boolean Arrays-Fancy Indexing-Sorting Arrays-Structured Data: NumPy’s Structured Array.
Lab Exercises
1. Demonstrate Aggregation
2. Demonstrate Indexing and Sorting
Week 4:
DATA MANIPULATION WITH PANDAS -I
Introduction to Pandas Objects-Data indexing and Selection-Operating on Data in Pandas-
Handling Missing Data-Hierarchical Indexing - Combining Data Sets
Lab Exercises
1. Demonstrate handling of missing data
2. Demonstrate hierarchical indexing

Week 5:
DATA MANIPULATION WITH PANDAS -II
Aggregation and Grouping-Pivot Tables-Vectorized String Operations -Working with Time
Series-High Performance Pandas- and query ()
Lab Exercises
1. Demonstrate usage of Pivot table
2. Demonstrate use of and query ()

Week 6:
VISUALIZATION AND MATPLOTLIB
Basic functions of matplotlib-Simple Line Plot, Scatter Plot-Density and Contour Plots-
Histograms, Binnings and Density-Customizing Plot Legends, Colour Bars-Three-Dimensional
Plotting in Matplotlib.
Lab Exercises
1. Demonstrate Scatter Plot
2. Demonstrate 3D plotting

Week 7:
Perform Data exploration and pre-processing in Python
Week 8:
Implement regularised linear regression
Week 9:
Implement Naive Bayes classifier for dataset stored as CSV file.
Week 10:
Implement regularized logistic regression
Week 11:
Build models using different Ensembling techniques
Week 12:
Build models using Decision trees
Week 13:
Build model using SVM with different kernels
Week 14:
Implement K-NN algorithm to classify a dataset.
Week 15:
Build model to perform Clustering using K-means after applying PCA and determining the
value of K using Elbow method.
INDUSTRY ORIENTED MINI PROJECT

B.Tech IV Year I Semester

Course Outcomes:

At the end of the course the student should be able to

1. Understand the working environment of an industry
2. Create an avenue in the industry in terms of a mini project
3. Predict a timeline for the project
4. Evaluate the requirements of the projects in terms of different subsystems
5. Create a dissemination report for the mini project.

METHOD OF EVALUATION:

The students in a group of 3 to 4 works on an industry oriented topic approved by the head of the department and prepare a comprehensive mini project report after completing the work to the satisfaction. The progress of the project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A mini project report is required at the end of the semester. The mini project work is evaluated based on oral presentation and the mini project report jointly by external and internal examiners constituted by the Head of the Department.
SEMANTIC WEB AND SOCIAL NETWORKS

B.Tech IV Year II Semester

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).
5. Understand and Analyze Social Networks and design solution for Web based Social Networks like Blogs and Online Communities.

UNIT-I:
Turing: What is Machine Intelligence?: Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents.

UNIT-II:
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:

UNIT-IV:

UNIT-V:
Social Network Analysis: What is Networks analysis, Development of the social networks analysis.

Developing social-semantic applications: Building Semantic Web Applications with social network features, Semantic Web Architecture.

TEXT BOOKS:

REFERENCE BOOKS:
E-COMMERCE

B.Tech IV Year II Semester

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.

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 and work Flow, Automation, Customization, 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

TEXT BOOK:

REFERENCE BOOKS:
1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, John Wiley.
TECHNICAL SEMINAR

B.Tech IV Year II Semester

Course Outcomes:

At the end of the course the student should be able to

1. Synthesizing information on any one specialized topic from text books, peer revised journals, hand books and other technical resources.
2. Accumulate information regarding the topic
3. Create a presentation to disseminate the accumulated data as presentation
4. Generation a technical seminar report comprising of all relevant information with stipulated standards.
5. Evaluate the intensity of topic in real time

METHOD OF EVALUATION:

During the seminar session each student is expected to prepare and present a topic on engineering/technology, for duration of about 8 to 10 minutes. In a session of three periods per week, 15 students are expected to present the seminar. Each student is expected to present at least twice during the semester and the student is evaluated based on that. At the end of the semester, he / she can submit a report on his / her topic of seminar and marks are given based on the report. A Faculty guide is to be allotted and he / she will guide and monitor the progress of the student and maintain attendance also. Evaluation is 100% internal.
COMPREHENSIVE VIVA VOCE

B.Tech IV Year II Semester

COURSE OUTCOMES:

1. Remember the fundamentals of Computer Science
2. Present his/her views logically and precisely
3. Explain the importance of Programming in terms of applications
4. Demonstrate the knowledge in program level
5. Exhibit professional etiquette suitable for career progression.

METHOD OF EVALUATION:

Comprehensive Viva-Voce will be conducted by a Committee consisting of Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is intended to assess the student's understanding of the subjects he/she studied during the B. Tech. course of study. The Comprehensive Viva-Voce is evaluated by the Committee. There are no internal marks for the Comprehensive Viva-Voce.
MAJOR PROJECT

B.Tech IV Year II Semester

COURSE OUTCOMES:
1. Analyze and communicate software requirement specifications
2. Apply design and development principles in the construction of software systems of varying complexity
3. Function effectively on team to accomplish a common goal
4. Demonstrate the knowledge, skills and attitudes of a professional engineer.
5. Exhibit documentation skills to generate project reports.

METHOD OF EVALUATION:

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepare a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.
Annexure -3
### III Year — I Semester (Fast Track Curriculum Scheme)

<table>
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<tr>
<th>S. No.</th>
<th>Category</th>
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### III Year — II Semester (Fast Track Curriculum Scheme)

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### B.Tech IV Year – I Semester (Fast Track Curriculum Scheme)

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### B.Tech IV Year – II Semester (Fast Track Curriculum Scheme)

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List of Open Elective Courses offered to other Departments (R20)

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<td>3. Fundamentals of Computer Networks</td>
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<td>4. Database Management Systems</td>
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<td>5. Software Engineering Fundamentals</td>
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<td>6. Essentials of Python Programming</td>
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<td>8. Introduction to IOT</td>
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<td>9. Fundamentals of Cyber Security</td>
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BASICS OF OPERATING SYSTEMS
(Open Elective – 1)

Course Outcomes:
At the end of the course, student will be able to:
1. Understand the basic functions of Computer System and Operating system.
2. Analyze process scheduling and synchronization.
3. Analyze various memory allocation techniques for effective utilization of memory.
4. Understand various file concepts for effective storage.
5. Understand the concept deadlock.

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

TEXT BOOKS:

REFERENCES BOOKS:
III Year B.Tech. CSE & IT - I Sem

CORE JAVA PROGRAMMING
(Open Elective - 1)

Course Outcomes:
At the end of the course student would be able to
1. Understanding of OOP concepts and basics of java programming
2. Analyze the concepts of Java programming in problem solving
3. Identify the concepts of packages and interfaces in java.
4. Analyze the usage of Exception handling and Multithreading in complex programs
5. Indentify the GUI applications and Applets

UNIT-I

OOPs concepts - Data abstraction, encapsulation, inheritance, benefits of inheritance, polymorphism, classes and objects, Procedural and object oriented programming paradigms.
Java Programming History of Java, Java buzzwords, comments, data types, variables, constants, scope and life time of variables, operators, expressions, type conversion and casting, enumerated types, control flow block scope, conditional statements, loops, break and continue statements, simple java stand alone programs, arrays.

UNIT-II

Concepts of classes and objects: class fundamentals Declaring objects, assigning object reference variables, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing - call by value, recursion
Inheritance : Inheritance types , super keyword, Method Overriding, Abstract Classes, final with inheritance

UNIT-III

Interfaces - Defining an interface, implementing interfaces, and accessing implementations through interface references, extending interfaces. Interfaces vs. Abstract classes.
Packages -Defining, Creating and Accessing a Package, Understanding Class path, Importing Packages, Member access rules

UNIT-IV

Exception Handling: Concepts of Exception Handling, Benefits of Exception Handling, Exception Hierarchy, Usage of try, catch, throw, throws and, finally, Built in Exceptions, Creating Own Exception Sub Classes.
Concepts of Multithreading: differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, thread priorities, daemon threads

UNIT-V

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, AWT Class Hierarchy
Applets: Concepts of Applets, Differences between Applets and Applications, Life Cycle of an Applet, Creating Applets, Passing Parameters to Applets.
TEXT BOOKS:
2. Understanding OOP with Java Updated Edition, T. Budd, Pearson Education.

REFERENCE BOOKS:
3. Introduction to Java Programming, Y. Daniel Liang, Pearson Education.
FUNDAMENTALS OF COMPUTER NETWORKS
(Open Elective - 1)

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. Analyze transport protocols for the given scenario.
5. Identify the protocols and functionalities in application layer

UNIT - I:

UNIT - II:
Data Link Layer - Design issues, Elementary Data Link Layer Protocols.
Multi Access Protocols - ALOHA, CSMA, Ethernet- Physical Layer, Ethernet, Mac Sub layer – CSMA/CD, Fast, Gigabit, 10-Gigabit Ethernets, Data link layer repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:
Network Layer: Network Layer Design issues, Routing algorithms - shortest path, flooding, Distance Vector Routing.

UNIT - IV:

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

TEXT BOOKS:

REFERENCE BOOKS:
DATABASE MANAGEMENT SYSTEMS
(Open Elective – 2)

Course Outcomes:
1. Understand the concepts of Database Management Systems
2. Understand Entity-Relationship Model for enterprise level databases
3. Analyze database and formulate the complex SQL queries
4. Identify various Relational Formal Query Languages
5. Analyze various Normal forms to carry out Schema refinement

UNIT-I

UNIT-II
Introduction to Data base design, ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. 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 and Views.

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

TEXT BOOKS:
REFERENCES BOOKS:
SOFTWARE ENGINEERING FUNDAMENTALS
(Open Elective – 2)

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

1. Understand various process models
2. Analyze the requirement engineering process for a project.
3. Analyze the design engineering and architectural design concepts.
4. Identify various testing techniques.
5. Examine various metrics for process and products.

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

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, Architectural styles and patterns.

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.

UNIT V:
TEXT BOOKS:

REFERENCES:
3. Fundamentals of Software Engineering, Rajid Mall, PHI, 2005
ESSENTIALS OF PYTHON PROGRAMMING
(Open Elective – 2)

Course Outcomes
At the end of the course, student will be able to:
1. Understand program flow in Python programming
2. Write programs on functions, modules and packages
3. Compare strings and regular expressions in data manipulation and validation
4. Analyse Lists, Tuples and Dictionaries in Python
5. Illustrate role of exception handling in managing errors

Unit – I
Introduction to Python:
History of python, Features of Python Language, Literal Constants, Comments, Reserved Words, Variables and Identifiers, Data Types, Input and output functions, Operators, Expressions, Type Conversion,
Control Statements: Selection / Conditional Branching Statements , Loop / Iterative statements . break, continue, pass, and else with loops

Unit – II
Functions and Modules:
Function Definition, Function Calling, Variable Scope and Lifetime, return statement, Types of Arguments: Required, Keyword, Default Variable-length . Recursive Functions, Modules, Packages in Python, Doc Strings

Unit – III
Strings and Regular Expressions:
String Operations, String Formatting Operator, Built-in String Methods and Functions, Comparing Strings, Metacharacters in Regular Expression ,Function in Regular Expression: match(),search(),sub(), findall() and finditer()

Unit – IV
Tuples: Creating Tuple, Accessing Values in a Tuple, Basic Tuple Operations, Nested Tuples, index() and count() methods of tuple, Variable-length Argument Tuples, zip() Function, Advantages of Tuple over List.
Difference between a List and a Dictionary
Unit V
File Handling
Introduction, Types of Files, Opening and Closing Files, Reading and Writing Files, File Positions, Renaming and Deleting Files.

Exception Handling:
Introduction, Handling Exception, Multiple Exceptions in a single Except block, Multiple Except Blocks and Multiple Exceptions, Finally Block.

Text Books
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
IV Year B.Tech. CSE & IT - I Sem

WEB DESIGN
(Open Elective – 3)

Course Outcomes:
At the end of this course, the student would be able to
1. Understand the HTML tags
2. Understand different style sheets.
3. Analyze the client side scripting through JavaScript
4. Analyze the server side scripting language through PHP
5. Examine the server side programming using JSP

UNIT I - INTRODUCTION

UNIT II – CSS
Style Sheets: Introduction to Style sheets – Formatting Text by Using Style Sheets – Formatting Paragraphs by Using Style Sheets

UNIT III - Client side Scripting
JavaScript language- Declaring variables, scope of the variables, functions, Objects in JavaScript, Dynamic HTML with JavaScript, Form validation.

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

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 in JSP.

TEXT BOOKS
2. The complete reference –PHP by Steven Holzner

REFERENCES
3. Java Server Pages -Hans
INTRODUCTION TO IoT
(Open Elective – 3)

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

1. Understand the concepts of IOT
2. Understand the architecture of IOT
3. Classify Communication Protocols
4. Discuss Various IOT challenges
5. Interpret the applications of IOT.

UNIT I:
Introduction to IoT
Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs

UNIT II:
IoT & M2M
Machine to Machine, Difference between IoT and M2M, Software define Network, The international-driven global value chain and global information monopolies

UNIT III:
Network & Communication aspects
Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination

UNIT IV:
Challenges in IoT
Design Issues: Connectivity, Security and Privacy, Flexibility and Compatibility, Data Collection and Processing
Development Challenges: Connectivity, Cross-Platform Compatibility (Hardware Devices), Data Collection & Processing, Lack of Skill Set

UNIT V:
Domain specific applications of IoT
Home automation, Industry applications, Surveillance applications, Healthcare applications.

Text Books:
1. Jan Holler Vlasios Tsiatsis Catherine Mulligan Stamatis Karnouskos Stefan Avesand David Boyle, "From Machine-to-Machine to the Internet of Things"
2. Vijay Madisetti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach"
FUNDAMENTALS OF CYBER SECURITY
(Open Elective – 3)

Course Outcomes:
At the end of the course, student will be able to:
1. Identify various cybercrimes.
2. Understand the tools and methods used in cyber crimes.
3. Understand computer forensics.
4. Identify various tools for computer forensics.
5. Discuss the importance of cyber security.

Unit-I
Cyber crime: Mobile and Wireless devices-Trend mobility-authentication service security-attacks on mobile phones-mobile phone security Implications for organizations-Organizational measurement for Handling mobile-Security policies and measures in mobile computing era. Cases.

Unit-II
Tools and methods used in cyber crime: Proxy servers and Anonymizers- Phishing Password cracking Keyloggers and Spy wares-Virus. and worms-Trojan Horse and Backdoors-Steganography-SQL Injection-Buffer overflow-Attacks on wireless network.

Unit-III
Understanding computer forensics: Historical background of cyber forensic analysis of e-mail Digital forensic life cycle-Network forensic-Setting up a computer forensic Laboratory-Relevance of the OSI 7 Layer model to computer Forensic-Computer forensic from compliance perspectives.

Unit-IV

Unit-V

TEXT BOOK:

REFERENCE BOOK:
2. Introduction to Cyber Security, Chwan-Hwa(john) Wu, J.David Irwin.CRC Press T&F Group
Annexure -5
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

List of Courses offered to other Departments (R20)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Department</th>
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<td>1</td>
<td>ECE</td>
<td>Object-Oriented Programming through Java</td>
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<td>B.Tech II Yr I Sem</td>
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<tr>
<td>2</td>
<td>EEE</td>
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</tr>
<tr>
<td></td>
<td>B.Tech III Yr II Sem</td>
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OBJECT ORIENTED PROGRAMMING through JAVA
(For the Dept. of Electronics and Communication Engineering)

II B.Tech I Semester

COURSE OUTCOMES:

After going through this course the student will be able to:
1. Able to solve real world problems using OOP techniques.
2. Able to understand the use of abstract classes.
3. Able to solve problems using inheritance, polymorphism.
4. Able to develop multithreaded applications with synchronization.
5. Able to handle run time errors while applying exception handling

Unit-I:
Fundamentals of Object Oriented Programming:
Object-Oriented Paradigm, Basic Concepts of Object Oriented Programming- Objects and Classes, Data abstraction and encapsulation, inheritance , Polymorphism, Data binding, Message Communication, Benefits of OOP, Applications of OOP.

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

Unit-II:
Concepts of classes and objects:
classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, Strings.

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

Unit-IV:
Packages:
Defining a Package, CLASSPATH, Access protection, importing packages.

Interfaces:
Defining an interface, implementing interfaces, variables in interfaces and extending interfaces.

Stream based I/O (java.io):
The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, The Console class, Serialization, Enumerations, auto boxing, generics.
Unit V:
Exception handling:
Concepts of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.
Multithreading:
Difference between multitasking and multithreading, Thread Lifecycle, Thread class, Runnable interface, Thread priorities, Daemon threads

TEXTBOOKS:
2. Budd T, Understanding Object Orient Programming with Java, Pearson, 2002

REFERENCE BOOKS:
1. Jaime Nino, Frederick A. Hosch, An Introduction to programming and object oriented design using java, Wiley, 2009
ESSENTIALS OF COMPUTER NETWORKS
(For the Dept. of Electrical and Electronics Engineering)

B. Tech. III Year II Semester

Course Outcomes:

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

1. Understand the scenario of reference models.
2. Illustrate various sub protocols in multi access protocols.
3. Outline various routing algorithms and their operations.
4. Analyze transport protocols for the given scenario.
5. Identify the protocols and functionalities in application layer

UNIT - I:

Introduction to Data Communication


UNIT - II:

Data Link Layer - Design issues, Elementary Data Link Layer Protocols.

Medium Access Protocols - ALOHA, CSMA, Ethernet- Physical Layer, Ethernet, Mac Sub layer - CSMA/CD, Fast, Gigabit, 10-Gigabit Ethernets, Data link layer repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:

Network Layer: Network Layer Design issues, Routing algorithms - shortest path, flooding, Distance Vector Routing.

Internetworking: IP addresses, IPv4, IPv6 Protocol, subetting

UNIT - IV:


UNIT - V:

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, DNS.
TEXT BOOKS:


REFERENCE BOOKS: