Vidya Jyothi Institute of Technology

(An Autonomous Institution)

Aziznagar Gate, C.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.

S.No	Name of the Member	Designation	Signature
1.	Dr. B. Vijayakumar, Professor & Head, CSE, VJIT	Chairman	
2.	Dr. O.B.V. Ramanaiah, Professor, CSE, JNTUH	JNTUH Nominee	
3.	Dr. V. Vijaya Kumar, Professor & DEAN, CSE&IT, AGI	Member	
4.	Dr. Swamy Das, Professor & Head, CSE, CBIT	Member	
5.	Dr. K.V.Ranga Rao, Professor& Head, CSE, NGIT	Member	
6.	Mr. Subramanyam, Delivery Head, TCS	Member	
7.	Dr. J. Sasikiran, Professor, CSE, LIET	Member	
8.	Dr. D Aruna Kumari, Professor, CSE, VJIT	Member	
9.	Dr. Ravi Mathey, Professor, CSE, VJIT	Member	
10.	Mr. B. Srinivasulu, Head, IT, VJIT	Member	
11.	Dr. Siddhartha Ghosh, Professor &Head, AI, VJIT	Member	S. Ghosh.
12.	Dr. K. Ramesh Babu, Professor, CSE, VJIT	Member	

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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- 20regulations**
2. **Essentials of Computer Networks course along with the syllabus offered to III Year of EEE Department under R- 20regulations**

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:

Dr. B. Vijayakumar	Dr. O.B.V. Ramanaiah	Dr. V. Vijaya Kumar	Dr. Swamy Das
Dr. K.V.Ranga Rao	Mr. Subramanyam	Dr. J. Sasikiran	Dr. D Aruna Kumari
Dr. Ravi Mathey	Mr. B. Srinivasulu	Dr. Siddhartha Ghosh	Dr. K.Ramesh Babu

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Annexure -1

R-20 Regulations of VJIT.

B.TECH(CSE) FIRST YEAR COURSE STRUCTURE

B.Tech I Year I Semester

S. No	Course Category	Course Title	L	T	P	Credits
1	BS-1	Mathematics-I	3	1	0	4.0
2	BS-2	Chemistry	3	1	0	4.0
3	BS Lab -1	Chemistry Lab	0	0	3	1.5
4	ES -1	Basic Electrical Engineering	3	0	0	3.0
5	ES Lab-1	Basic Electrical Engineering Lab	0	0	2	1.0
6	ES Lab -2	Engineering Workshop	0	1	3	2.5
7	H&S Lab-1	English Language Skills Lab (ELSL)	0	0	2	1.0
8	ES-2	Programming for Problem Solving-I	2	0	0	2.0
9	ES Lab -3	Programming for Problem Solving Lab-I	0	0	2	1.0
		Total	**11**	**3**	**12**	**20.0**

B.Tech I Year II Semester

S.No	Course Category	Course Title	L	T	P	Credits
1	BS-3	Mathematics-II	3	1	0	4.0
2	BS-4	Applied Physics	3	1	0	4.0
3	BS Lab - 2	Physics Lab	0	0	3	1.5
4	H&S-1	English	2	0	0	2.0
5	H&S Lab-2	English Communication Skills Lab (ECSL)	0	0	2	1.0
6	ES-3	Programming for Problem Solving-II	2	0	0	2.0
7	ES-Lab -4	Programming for Problem Solving Lab-II	0	0	2	1.0
8	ES-4	Engineering Graphics & Modeling	1	0	3	2.5
		Total	**11**	**2**	**10**	**18**

B.TECH(CSE) SECOND YEAR COURSE STRUCTURE

B.Tech II Year I Semester

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

B.Tech II Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-4	Design & Analysis of Algorithms	3	1	0	4
2	PC-5	Computer Organization	3	0	0	3
3	PC-6	Java Programming	3	0	0	3
4.	PC-7	Software Engineering	3	0	0	3
5	PC-8	Database Management Systems	3	0	0	3
6	H&S-2	Professional Communication	2	0	0	2
7	PC Lab	Java Programming Lab	0	0	2	1
8	PC Lab	Database Management Systems Lab	0	0	2	1
9	MC-2	Environmental Science/ Gender Sensitization/Cyber Law	2	0	0	0
Total number of Credits			**18**	**1**	**6**	**20**

B.TECH (CSE) THIRD YEAR COURSE STRUCTURE

B.Tech III Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-9	Formal Languages and Automata Theory	3	0	0	3
2	PC-10	Computer Networks	3	0	0	3
3	PC-11	Operating Systems	3	0	0	3
4	PC-12	Web Technologies	3	0	0	3
5	PE-1	Principles of Programming Languages Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE – 1	Open Elective - I	3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	PC Lab	Web Technologies Lab	0	0	2	1
9	Value added course -1	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

B.Tech III Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	H&S-3	Managerial Economics and Financial Analysis	3	0	0	3
2	PC-13	Compiler Design	3	0	0	3
3	PC-14	Data Warehousing & Data Mining	3	0	0	3
4	PC-15	Artificial Intelligence	3	0	0	3
5	PE -2	Object Oriented Analysis & Design Information Security Software Testing Methodologies Information Retrieval Systems	3	0	0	3
6	OE - 2	Open Elective –II	3	0	0	3
7	PC Lab	Data mining & Case Tools Lab	0	0	2	1
8	H & S Lab-3	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -2	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

B.TECH (CSE) FOURTH YEAR COURSE STRUCTURE

B.Tech IV Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-16	Mobile Application Development	3	0	0	3
2	PC-17	Cloud Computing	3	0	0	3
3	PE -3	Big Data Analytics Internet of Things R Programming Introduction to Data Science	3	0	0	3
4	PE-4	Advanced Databases Block-Chain Technologies Machine Learning Image Processing	3	0	0	3
5	OE-3	Open Elective-3	3	0	0	3
6	PC Lab	Mobile Application Development Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab Data Science Lab	0	0	2	1
8	PW	Industry Oriented Mini Project	0	0	0	3
Total			**15**	**0**	**4**	**20**

B.Tech IV Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-18	Semantic Web and Social Networks	3	0	0	3
2	PC-19	E-Commerce	3	0	0	3
3	PW	Technical Seminar	0	0	4	2
4	PW	Comprehensive Viva Voce	0	0	0	2
5	PW	Major Project	0	0	20	10
Total			**6**	**0**	**24**	**20**

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Annexure -2

B.TECH (CSE) SECOND YEAR COURSE STRUCTURE & SYLLABUS

B.Tech II Year I Semester

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

B.Tech II Year II Semester

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

DATA STRUCTURES

B.Tech II Year I Semester

L	T	P	C
3	0	0	3

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:

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

Text Books:

1. Data Structures Using C, 2nd Edition, Reema Thereja OXFORD higher Education

2. Fundamentals of Data Structures, 2nd Edition, Horowitz and Sahani, *Galgotia Publications* Pvt Ltd Delhi India.

Reference Books:

1. Data Structures, Seymour Lipschutz, Schaum's Outlines, Tata McGraw-Hill, Special Second Edition.
2. Data Structures Using C and C++II, Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, Delhilndia.
3. Data Structures, A Pseudo code Approach with C, Richard F.Gillberg&Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition,2005.

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

B.Tech II Year I Semester

L	T	P	C
3	0	0	3

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:

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

UNIT - II:

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

UNIT - III:

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

UNIT - IV:

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

UNIT - V:

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

Text Books:

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

Reference Books:

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

PYTHON PROGRAMMING

B.Tech II Year I Semester

L	T	P	C
3	0	0	3

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, Buil-in Functions to Check, Get, Set and Delete Class Attributes, Garbage Collection(Destroying Objects).

Unit – IV:

Inheritance:

Inheriting Classes in Python: Types of Inheritance; Composition/Containership, Abstract Classes, Meta class.

Operator Overloading:

Introduction, Implementing Operator Overloading, Overriding Methods.

Unit – V:

File Handling

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

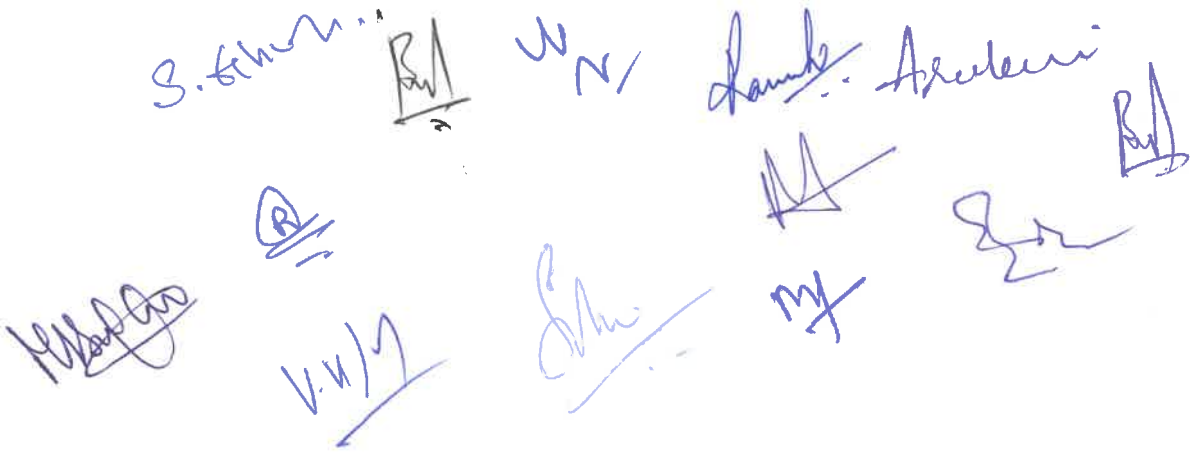
Exception Handling:
Introduction, Handling Exception, Multiple Except Blocks and Multiple Exceptions, Finally Block. Case Study: Data Science.

Text Books

1. "Reema Thareja", Python Programming using Problem Solving Approach, First Edition, Oxford Higher Education.

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

L	T	P	C
0	0	2	1

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
7. Program to illustrate insertion, deletion and searching in Binary Search Tree.
8. Program to illustrate Insertion, deletion and Rotation on AVL Trees.
9. 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 Stings, String Operations and Regular Expressions

Exercise - IV

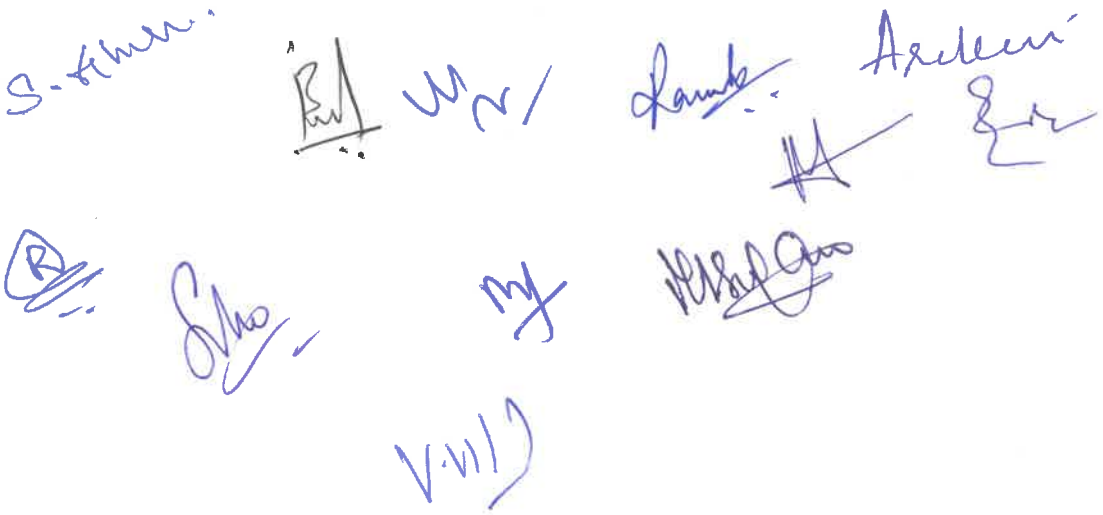
a) Write a Program to implement Class and Object
b) Write a Program to implement Static and Instance methods, and Abstract Classes.

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

L	T	P	C
4	0	0	4

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

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

UNIT III:

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

UNIT IV:

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph 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:

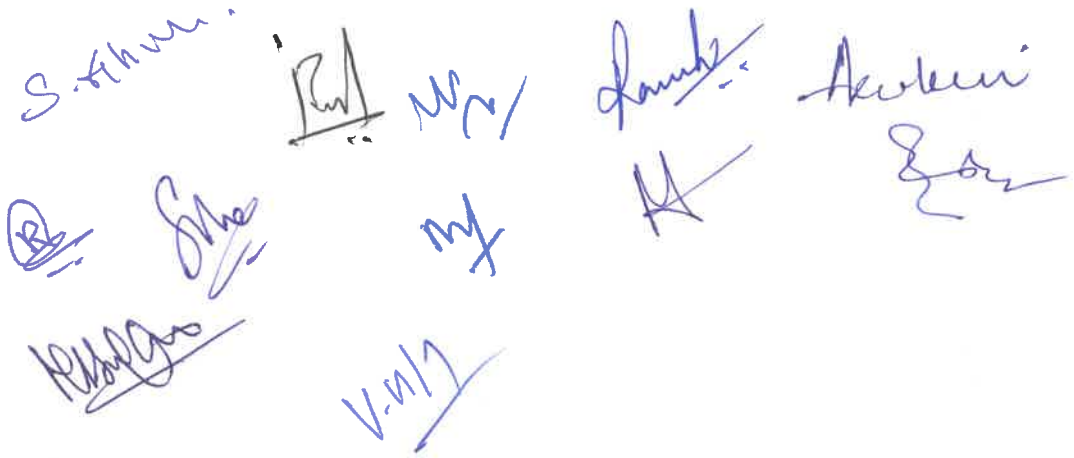
Lower Bound Theory: Comparison Trees, **NP-Hard and NP-Complete problems:** Basic concepts, non-deterministic algorithms, NP Hard and NP Complete classes, Satisfiability problem, Clique Decision Problem (CDP), Node cover decision problem.

Text Books:

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, SatrajSahni and Rajasekharan, Galgotia publications Pvt.Ltd.

References:

1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearsoneducation.
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGrawHill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearsoneducation.



COMPUTER ORGANIZATION

B.Tech II Year II Semester

L	T	P	C
3	0	0	3

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 inter connection 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 offlags.

UNIT III:

CPU and Main Memory interface- Programming the basic computer – Machine Assembly Languages. **Assembler:** basic assembly language instructions (ADD, SUB, LOAD, STORE, MOV, CMP, JUMP).

Micro-programmed control: control memory, address sequencing, micro program example and design of control unit.

UNIT IV:

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

I/O interface: I/O Bus and Interface modules, I/O versus Memory Bus.

Modes of Transfer: Example of programmed I/O, interrupt-initiated I/O, software considerations. Daisy- Chaining priority.

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

UNIT V:

Multi Processors: Characteristics of Multi-Processor; **Interconnection structures:** Time shared common bus, multiport memory, crossbar switch, multi-stage switching network; **Introduction to Flynn's classification:** SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

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

Reference Books:

1. Computer Organization Carl Hamacher, ZvonksVranesic, SafeaZaky, V Edition, McGraw Hill.

JAVA PROGRAMMING

B.Tech II Year II Semester

L	T	P	C
3	0	0	3

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, Adapterclasses.

UNIT V:

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

Applets Concepts of Applets, life cycle of an applet, creating applets, passing parameters toapplets.

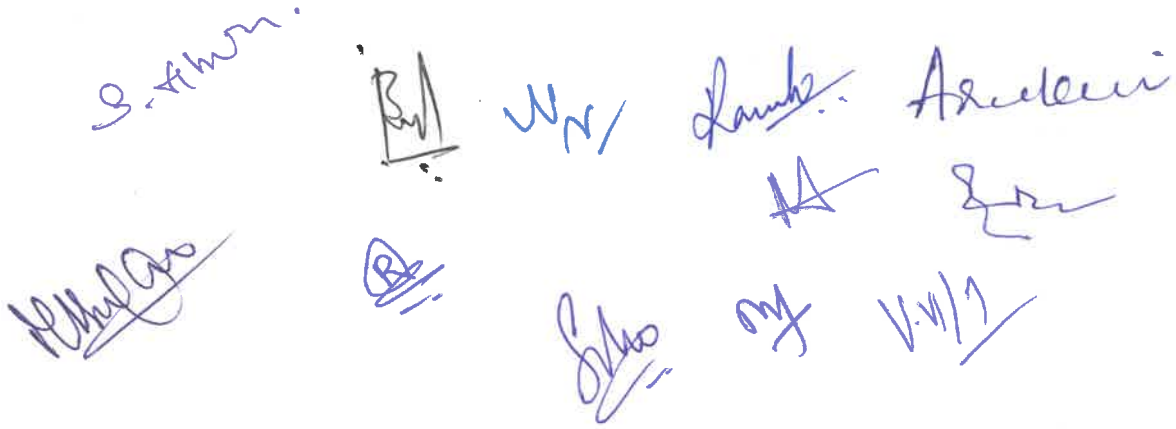
JDBC Connectivity: JDBC Type 1 to 4 Drivers, connection establishment, Query Execution.

Text Books:

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

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

L	T	P	C
3	0	0	3

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:

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

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

UNIT II:

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

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

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

UNIT III:

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

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

User interface design: Golden rules.

UNIT IV:

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

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

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, Bruce R. Maxim, 8th Edition, McGraw Hill International Edition.
2. Software Engineering- Ian Sommerville, 7th edition, Pearson education.

References:

1. Software Engineering- K.K. Agarwal& Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, JohnWiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.

DATABASE MANGEMENT SYSTEMS

B.Tech II Year II Semester

L	T	P	C
3	0	0	3

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:

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

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

UNIT-II:

Introduction to SQL: Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions Nested Sub queries, Modification of the Database.

Intermediate and Advanced SQL: Join Expressions, Views, Integrity Constraints, SQL Data Types, Authorization. Functions and Procedures, Triggers.

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:

Transactions: Transaction Concept, a Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity.

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

UNIT-V:

Recovery System: Failure Classification, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with Loss of Nonvolatile Storage, ARIES, Remote Backup Systems.

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S.Sudarshan, Database System Concepts, 6thEdition, Tata McGraw-Hill.
2. RaghuRamaKirshna , JohannesGehrk, Database Management System, Tata Mc GrawHill 3rd Edition.

Reference Books:

1. PeterRob&Carlos Coronel Database System Concepts Cengage Learning.
2. Ramez Elmasri, ShamkanthB. Navrate –Fundamentals of Database Systems 7th Edition, Pearson Education.
3. C.J. Date Introduction to Database Systems Pearson Education

JAVA PROGRAMMING LAB

B.Tech II Year II Semester

L	T	P	C
0	0	2	1

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

L	T	P	C
0	0	2	1

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_data: date, **cust_id: integer, item_id: integer,** qty sold: integer)
For the above schema, perform the following.

a. Create the tables with the appropriate integrity constraints.
b. Insert around 10 records in each of the tables
c. List all the bills for the current date with the customer names and item numbers
d. List the total Bill details with the quantity sold, price of the item and the final amount
e. List the details of the customer who have bought a product which has a price>200.
f. Give a count of how many products have been bought by each customer
g. Give a list of products bought by a customer having cust_id as5.
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**)
Book (**book_no: integer**, book_name:string, author: string)
Iss_rec **(iss_no:integer**, iss_date: date, **Mem_no: integer, book_no: integer**)
For the above schema, perform the following.

a. Create the tables with the appropriate integrityconstraints.
b. Insert around 10 records in each of thetables.
c. List all the student names with their membershipnumbers
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 eachstudent.
g. Give a list of books taken by student with stud_no as 5.
h. List the book details which are issued as oftoday.
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 integrityconstraints.
b. Insert around 10 records in each of thetables.
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 eachdepartment.
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 thetables.
c. List all the customer names with their membershipnumbers
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 Legendll
f. Give a count of how many cassettes have been borrowed by eachcustomer.
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 outs the iss_no, iss_date, cust_name,cass_name
j. Create a view which lists issues-date wise for the last one week

5. **Database Schema for a student-Lab scenario**

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

a. Create the tables with the appropriate integrity constraints.
b. Insert around 10 records in each of the tables.
c. List all the machine allotments with the student names, lab and machine numbers
d. List the total number of lab allotments 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 thelabs.
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

S. No.	Category	Course Title	L	T	P	Credits
1	PC-9	Formal Languages and Automata Theory	3	0	0	3
2	PC-10	Computer Networks	3	0	0	3
3	PC-11	Operating Systems	3	0	0	3
4	PC-12	Web Technologies	3	0	0	3
5	PE-1	Principles of Programming Languages Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE – 1	Open Elective – I	3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	PC Lab	Web Technologies Lab	0	0	2	1
9	Value added course -1	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

B.Tech III Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	H&S-3	Managerial Economics and Financial Analysis	3	0	0	3
2	PC-13	Compiler Design	3	0	0	3
3	PC-14	Data Warehousing & Data Mining	3	0	0	3
4	PC-15	Artificial Intelligence	3	0	0	3
5	PE -2	Object Oriented Analysis & Design Information Security Software Testing Methodologies Information Retrieval Systems	3	0	0	3
6	OE - 2	Open Elective –II	3	0	0	3
7	PC Lab	Data mining & Case Tools Lab	0	0	2	1
8	H & S Lab	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -2	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

III Year – I Semester (Fast Track Curriculum Scheme)

B.Tech III Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-9	Formal Languages and Automata Theory	3	0	0	3
2	PC-10	Computer Networks	3	0	0	3
3	PC-11	Operating Systems	3	0	0	3
4	PC-12	Web Technologies	3	0	0	3
5	PE-1	Principles of Programming Languages Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE - 1	Open Elective - I	3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	PC Lab	Web Technologies Lab	0	0	2	1
9	Value added course -1	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

III Year – II Semester (Fast Track Curriculum Scheme)

S. No.	Category	Course Title	L	T	P	Credits
1	H&S-3	Managerial Economics and Financial Analysis	3	0	0	3
2	PC-13	Compiler Design	3	0	0	3
3	PC-14	Data Warehousing& Data Mining	3	0	0	3
4	PC-15	Artificial Intelligence	3	0	0	3
5	PE -2	Object Oriented Analysis & Design Information Security Software Testing Methodologies Information Retrieval Systems	3	0	0	3
6	OE - 2	Open Elective –II	3	0	0	3
7	PC Lab	Data mining& Case Tools Lab	0	0	2	1
8	H & S - Lab 3	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -2	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
10	PC-18	Semantic Web & Social Networks	3	0	0	3
Total			**23**	**0**	**4**	**24**

FORMAL LANGUAGES AND AUTOMATA THEORY

L	T	P	C
3	0	0	3

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:

1. "Introduction to Automata Theory, Languages and Computation". Hopcroft H.E. and Ullman J.D., 3rd Edition, Pearson Education.
2. "Formal Languages and Automata Theory", Chander Kumar Nagpal , First edition, Oxford University press.

Reference Books:

1. Daniel I. A.Cohen, Introduction to Computer Theory, Second Edition, John Wiley.
2. John C Martin, Introduction to languages and the theory of Computation, Third Edition, TATA McGraw Hill, 2014.
3. Vivek Kulakarni, Theory of Computation, Oxford University press 2013, Second Edition, 2014.

COMPUTER NETWORKS

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

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:

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

Physical Layer: Guided transmission media, wireless transmission media.

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.

The Internet Transport Protocols: UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

UNIT - V:

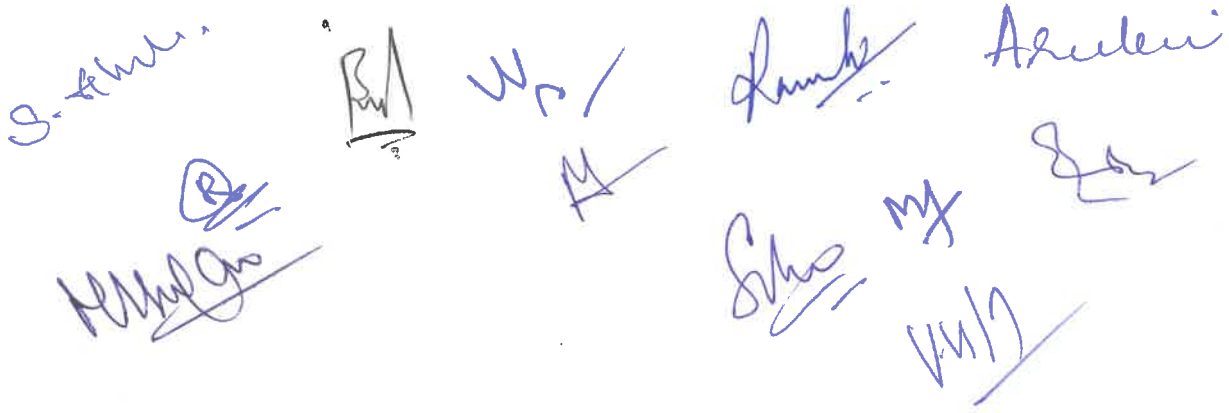
Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S.Keshav, 2ndEdition, Pearson Education.
2. Understanding Communications And Networks, 3rd Edition,W.A .Shay,Cengage Learning.
3. Introduction To Computer Networks And Cyber Security, Chwan-Hwa(John)Wu,J.David Irwin, CRC Press.



OPERATING SYSTEMS

L	T	P	C
3	0	0	3

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:

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

UNIT - II:

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling Scheduling Queues, Schedulers, Context Switching, Preemptive Scheduling, Scheduling Criteria, Scheduling algorithms, thread scheduling, Case studies: Linux, Windows.

Process Coordination Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

UNIT - III:

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

UNIT - IV:

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

Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management.

UNIT - V:

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

Protection System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

TEXT BOOKS:

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

REFERENCES BOOKS:

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

WEB TECHNOLOGIES

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

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:

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

TEXT BOOKS

1. Programming the World Wide Web, 4th Edition by Robert W. Sebesta
2. Web Technologies, Uttam K Roy, Oxford University Press, 2010.

REFERENCE BOOKS

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

PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective- 1)

III Year B.Tech. CSE – I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT I:

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

UNIT II:

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotation semantics and axiomatic semantics for common programming language features.

Names, Bindings, Data types: Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types.

UNIT III:

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

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

UNIT IV:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

UNIT V:

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction,fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.
3. LISP Patric Henry Winston and Paul Horn Pearson Education.

LINUX PROGRAMMING
(Professional Elective-1)

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT - I:

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities. Sed-Scripts, Operation, Addresses, Commands, Applications, awk-Execution, Fields and Records, Scripts, Operation, Patterns, Actions, functions.

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, pies-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:

1. UNIX Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
2. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.

REFERENCE BOOKS:

1. UNIX and Shell Programming, B. A. Forouzan and R. F. Gilberg, Cengage Learning.
2. UNIX for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
3. UNIX shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.

SOFTWARE PROJECT MANAGEMENT
(Professional Elective-1)

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT I:

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

UNIT II:

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new: The principles of conventional software engineering, principles of modern software management, transitioning to an iterative process.

UNIT III:

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures: A Management perspective and technical perspective.

UNIT IV:

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

Process Automation: Automation Building Blocks, the Project Environment.

UNIT V:

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Example: Future Software Project Management: Modern Project Profiles Next generation Software economics, modern Process transitions.

Case Study: The Command Center Processing and Display System-Replacement (CCPDS-R)

TEXT BOOKS:

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

REFERENCE BOOKS:

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

COMPUTER GRAPHICS
(Professional Elective - 1)

L	T	P	C
3	0	0	3

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.
3. Understand 3D Geometrical transforms.
4. Apply different visible surface detection methods.
5. Plan the sequence of an animation for a given scenario.

UNIT-I:

Introduction

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

Output Primitives

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

UNIT-II:

2D Geometrical Transformations

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

2D Viewing

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

UNIT-III:

3D Object Representation

Polygon surfaces, quadric surfaces. Spline representation, Hermite curve, Bezier curve and B-spine curves. Bezier and B-spline surfaces, sweep representations, octrees BSP Trees.

3D Geometric transformations

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

UNIT-IV:

Visible Surface Detection Methods:

Classification, back face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, and area sub division and octree methods.

Illumination Models and Surface Rendering Methods Basic illumination models, polygon rendering method.

UNIT-V

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

TEXT BOOKS

1 "Computer Graphics C version", Donald Hearn and M. Pauline Baker, 2nd Edition, Pearson education.

REFERENCE BOOKS

1 Computer Graphics Principles & practice, second edition In C, Foley, VanDam, Feiner and Hugues, Pearson Education.
2 "Computer Graphics Second edition", Zhigand xiang. Roy Plastock, Schaum's outlines. Rats Mc Graw 19 edition.
3 Procedural elements lot Computer Graphics, David F Rogers. Tata Mc Graw hill, 2nd edition.

COMPUTER NETWORKS & OPERATING SYSTEMS LAB

B.Tech III Year I Semester

L	T	P	C
0	0	2	1

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 farming 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

L	T	P	C
0	0	2	1

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.

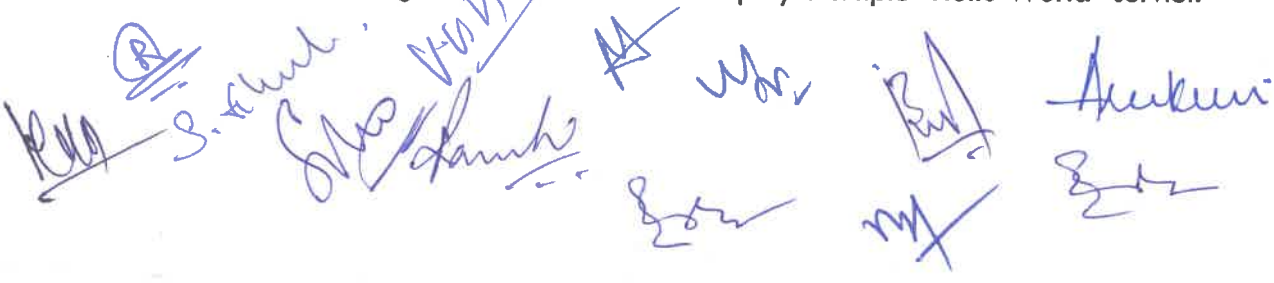
Week 6: Validate an XML document using DTD and XML schema.

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.

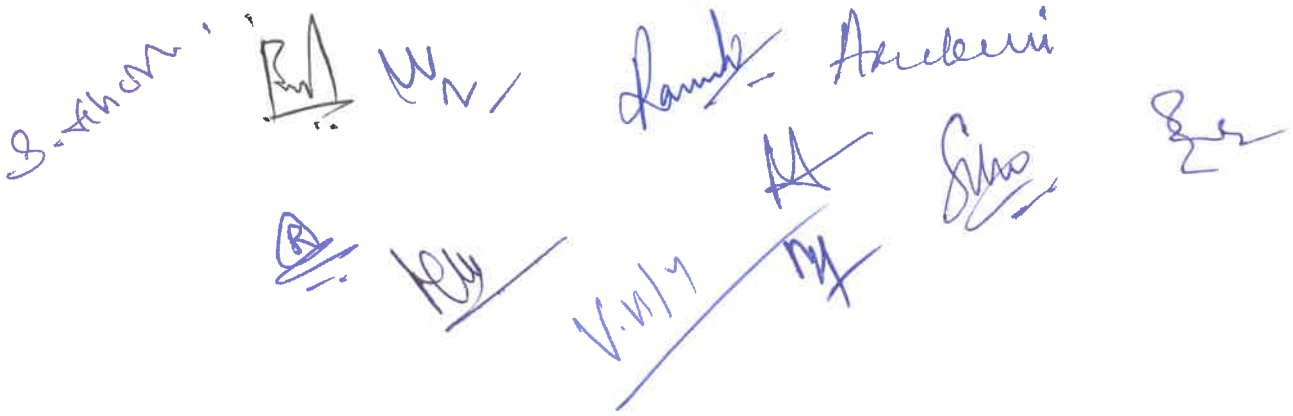
Week 12: Write a servlet program for authenticating users for the above program.

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

L	T	P	C
3	0	0	3

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:

Syntactic Specification: Context Free Grammars, Derivations and Parse Trees, Capabilities of Context Free Grammars, Syntactic Phase errors, Semantic errors.

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 CALR 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.

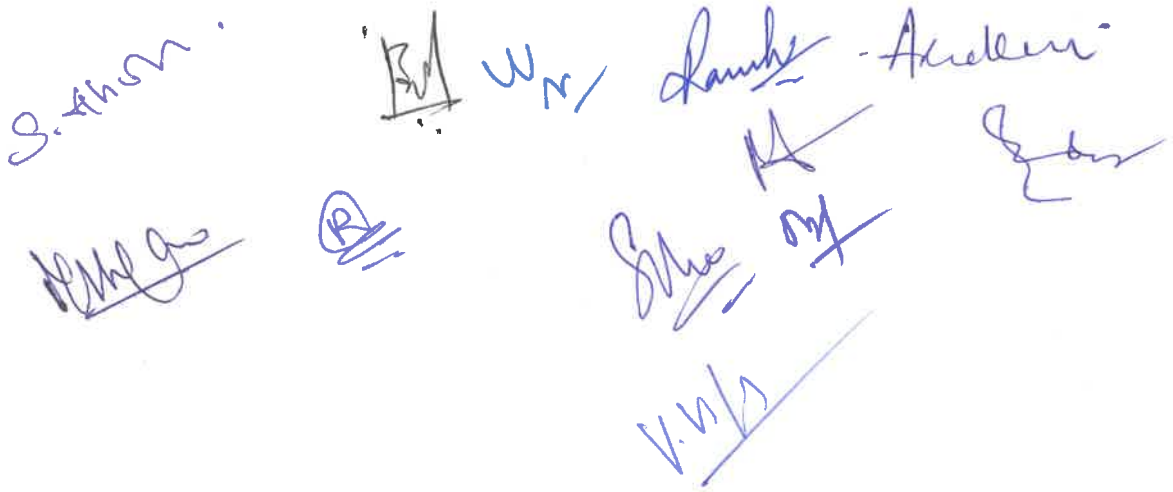
Code Generation: Object programs, problems in Code generation, A Machine Model, A Simple Code generator, Register allocation and assignment, Peephole optimization.

Text Book:

1. Alfred V Aho, Jeffrey D Ullman, Principles of Compiler Design, Pearson Education, 2001.

Reference Books:

1. J P Trembly and P G Sorenson, The Theory and practice of Compiler Writing, McGraw Hill, 2005.
2. Alfred V Aho, Ravi sethi, Jeffrey D Ullman, Compilers-Principles, Techniques and Tools, Pearson Education, second edition.
3. Dick Grone, Henri E Bal, Ceriel J H Jacobs, Modern Compiler Design, Wiley Dreamtech, 2006.



DATA WAREHOUSING & DATA MINING

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT – I:

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

UNIT – II:

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

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

UNIT – III:

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

UNIT – IV:

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

UNIT – V:

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

Text Books:

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

References:

1. Data Mining Techniques Arun K Pujari, 2nd edition, Universities Press.
2. Data Warehousing in the Real World Sam Aanhory & Dennis Murray, Pearson Edn Asia, 2002.
3. Data Warehousing Fundamentals Paulraj Ponnaiah Wiley student Edition.

ARTIFICIAL INTELLIGENCE

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

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:

Logical Agents: Knowledge-Based Agents, The Wumpus World, Logic, Propositional Logic - A Very Simple Logic, **First-Order Logic:** Representation of FOL, Syntax and Semantics of FOL, Knowledge Engineering in FOL

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

Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks, Efficient Representation of Conditional Distributions, inference in Bayesian Networks.

Unit – IV:

Probabilistic Reasoning over Time: Time and Uncertainty, Hidden Markov Models (HMM).
Sequential Decision Problems: Markov Decision Process, MDP Formulation, Utilities over time, Optimal policies and utilities of states, Value Iteration, Policy Iteration and Partially Observable MDPs.

Unit – V:

Reinforcement Learning: Passive Reinforcement Learning, Direct Utility Estimation, Adaptive dynamic Programming, Temporal Difference Learning, Active Reinforcement Learning- Q Learning.

Text Books:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 3rd Edition, Prentice Hall

Reference Books:

1. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill.
2. Trivedi, M.C., "A Classical Approach to Artificial Intelligence", Khanna Publishing House, Delhi.
3. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011.

OBJECT ORIENTED ANALYSIS & DESIGN
(Professional Elective-2)

L	T	P	C
3	0	0	3

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-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT– IV:

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

UNIT– V:

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

Case Study: The Unified library application, ATM System.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education 2nd Edition
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd,2003.

REFERENCE BOOKS:

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

INFORMATION SECURITY
(Professional Elective-2)

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT - I:

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

UNIT – II:

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

UNIT – III:

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

UNIT – IV:

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

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

UNIT – V:

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

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education, 4th Edition.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permeh, wiley Dreamtech,2nd Edition.

REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press), 2017.
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, 2nd Edition, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson.

SOFTWARE TESTING METHODOLOGIES
(Professional Elective-2)

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

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:

Testing as an Engineering Activity, Role of Process in Software Quality, Testing as a Process, Basic Definitions, Software Testing Principles, The Tester's Role in a Software Development Organization, Consequences of bugs and taxonomy of bugs, Levels of Testing.

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:

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

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:

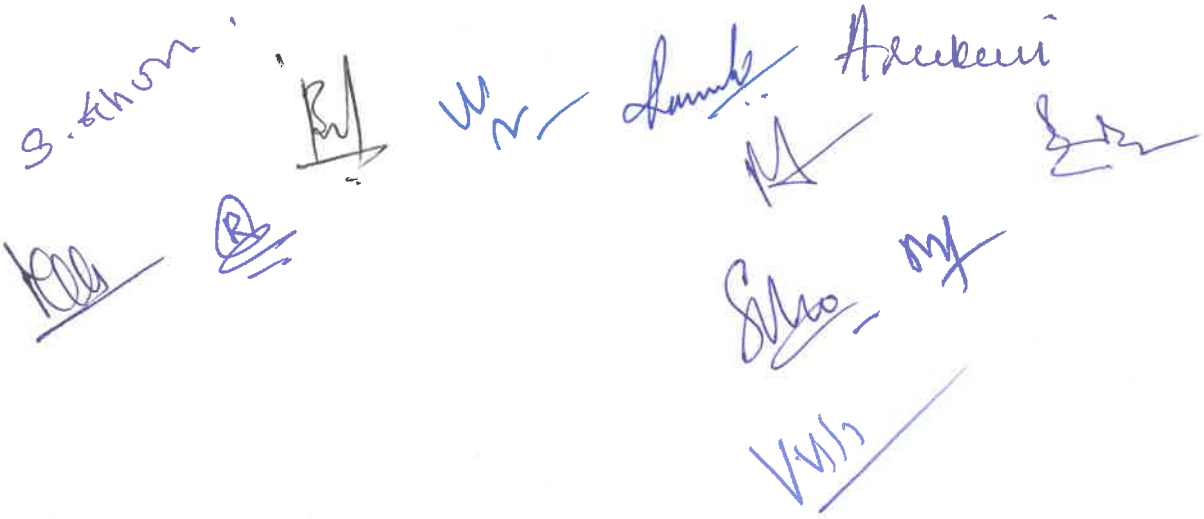
Test Automation: Skills needed for automation, scope of automation, design and architecture for automation, requirements for a test tool, challenges in automation, Test metrics and measurements, project, progress and productivity metrics.

TEXT BOOKS:

1. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing Principles and Practices", Pearson education, 2006.
2. Boris Beizer, "Software Testing Techniques", Second Edition,Dreamtech, 2003

REFERENCE BOOKS:

1. Ilene Burstein, "Practical Software Testing" , Springer International Edition, 2003
2. Aditya P.Mathur, "Foundations of Software Testing", Pearson Education, 2008.
3. Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education, 2003.



INFORMATION RETRIEVAL SYSTEMS
(Professional Elective – 2)

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

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.

Retrieval Strategies: Vector space model, Probabilistic retrieval strategies: Simple term weights, Non binary independence model, Language Models.

UNIT-II:

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

UNIT-III:

Retrieval Utilities: Semantic networks, Parsing Cross-Language Information Retrieval: Introduction, Crossing the language barrier.

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:

1. David A. Grossman, Ophir Frieder, information Retrieval —Algorithms and Heuristics, Springer, 2nd Edition (Distributed by Universities Press), 2004.
2. Gerald J Kowaiski, Mark T Maybury. Information Storage and Retrieval Systems, Springer, 2000

REFERENCE BOOKS:

1. Soumen Chakrabarti, Mining the Web : Discovering Knowledge from Hypertext Data, Morgan- Kaufmann Publishers, 2002
2. Christopher D. Manning, Prabhakar Raghavan, Hinñch Schütze, An Introduction to Information Retrieval, Cambridge University Press, Cambridge, England, 2009

DATA MINING & CASE TOOLS LAB

B.Tech III Year II Semester

L	T	P	C
0	0	2	1

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 ma-chine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)
The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

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

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

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

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

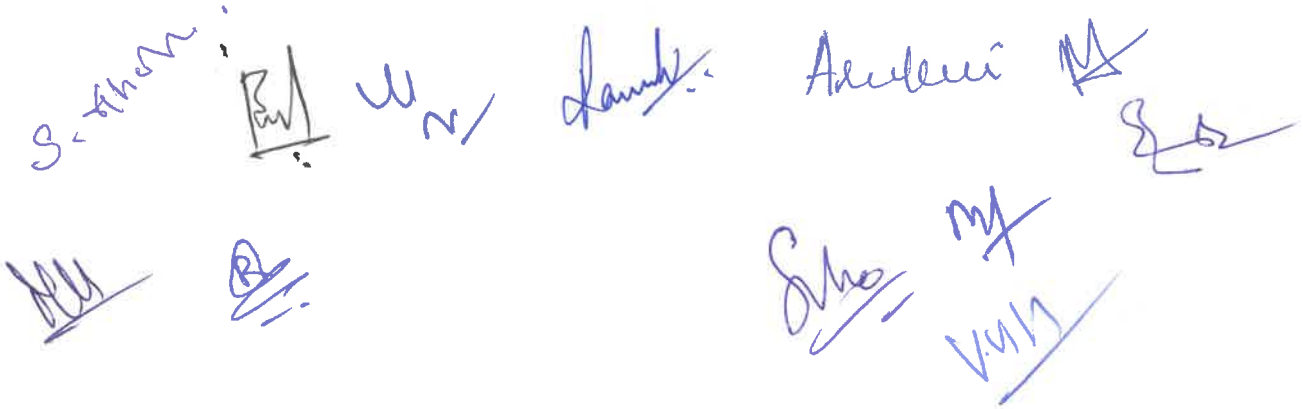
The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer.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

Week 3 & Week 4:

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

Week 5 & Week 6:

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



B.TECH (CSE) FOURTH YEAR COURSE STRUCTURE & SYLLABUS

B.Tech IV Year I Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-16	Mobile Application Development	3	0	0	3
2	PC-17	Cloud Computing	3	0	0	3
3	PE -3	Big Data Analytics Internet of Things R Programming Introduction to Data Science	3	0	0	3
4	PE-4	Advanced Databases Block-Chain Technologies Machine Learning Image Processing	3	0	0	3
5	OE-3	Open Elective-3	3	0	0	3
6	PC Lab	Mobile Application Development Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab Data Science Lab	0	0	2	1
8	PW	Industry Oriented Mini Project	0	0	0	3
Total			**15**	**0**	**4**	**20**

B.Tech IV Year II Semester

S. No.	Category	Course Title	L	T	P	Credits
1	PC-18	Semantic Web and Social Networks	3	0	0	3
2	PC-19	E-Commerce	3	0	0	3
3	PW	Technical Seminar	0	0	4	2
4	PW	Comprehensive Viva Voce	0	0	0	2
5	PW	Major Project	0	0	20	10
Total			**6**	**0**	**24**	**20**

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

S. No.	Category	Course Title	L	T	P	Credits
1	PC-16	Mobile Application Development	3	0	0	3
2	PC-17	Cloud Computing	3	0	0	3
3	PE -3	Big Data Analytics Internet of Things R Programming Introduction to Data Science	3	0	0	3
4	PE-4	Advanced Databases Block-Chain Technologies Machine Learning Image Processing	3	0	0	3
5	OE-3	Open Elective-3	3	0	0	3
6	PC Lab	Mobile Application Development Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab Data Science Lab	0	0	2	1
8	PW	Industry Oriented Mini Project	0	0	0	3
9	PC-19	E-Commerce	3	0	0	3
Total			**18**	**0**	**4**	**23**

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

S. No.	Category	Course Title	L	T	P	Credits
1	PW	Technical Seminar	0	0	4	2
2	PW	Comprehensive Viva Voce	0	0	0	2
3	PW	Major Project	0	0	20	10
Total			**0**	**0**	**24**	**14**

MOBILE APPLICATION DEVELOPMENT

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT I:

JAVA FX TECHNOLOGY FOR RICH CLIENT APPLICATIONS

Introduction: Introduction to mobile application development, 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.javafile, 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

Broad cast 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:

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

REFERENCE BOOKS:

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

CLOUD COMPUTING

IV Year B.Tech. CSE – I Semester

L	T	P	C
3	0	0	3

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:

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

UNIT II:

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

Enriching the 'Integration as a Service' Paradigm for the Cloud Era: An Introduction, The Onset of Knowledge Era, The Evolution of SaaS, The challenges of SaaS Paradigm, Approaching the SaaS integration enigma, new integration scenarios, the integration. Methodologies, Saas integration products and platforms, SaaS Integration Services, Business to Business Integration (B2Bi) Services.

UNIT - III:

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

UNIT - IV:

Virtual Machines Provisioning and Migration Services: Introduction and Inspiration, Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action, Provisioning in the Cloud Context, Future Research Directions.

Secure Distributed Data Storage in Cloud Computing: Introduction, Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing, Open Questions and Challenges.

UNIT - V:

SLA Management in Cloud Computing: A Service Provider's Perspective: Inspiration, Traditional Approaches to SLO Management, Types of SLA, Life Cycle of SLA, SLA Management in Cloud, Automated Policy based Management.

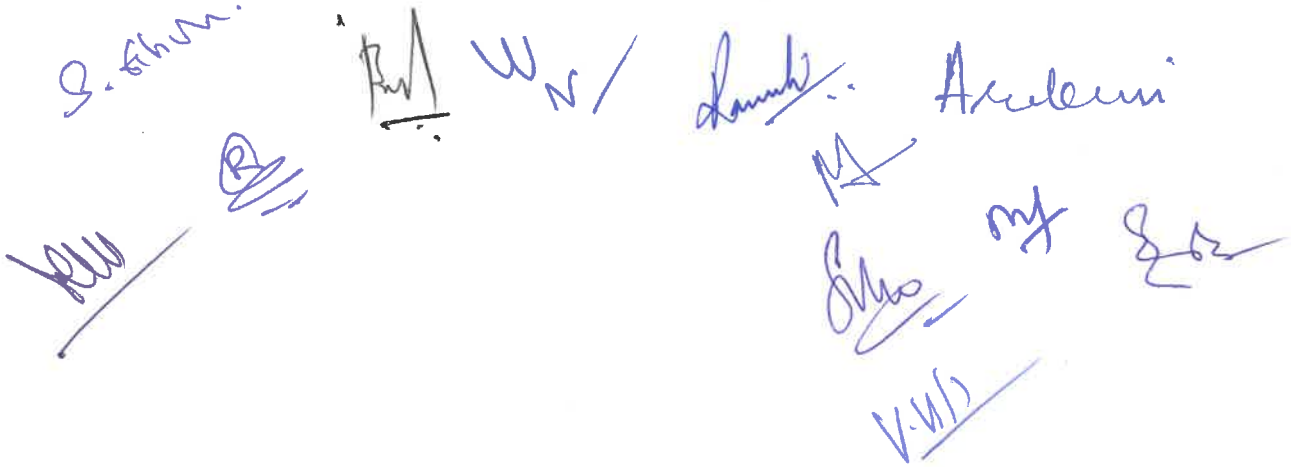
Data Security in the Cloud: An Introduction to the idea of Data Security, The Current State of Data Security in the Cloud, Homo Sapiens and Digital Information, Cloud Computing and Data Security Risk, Cloud Computing and Identity, Digital Identity and Data Security, Content Level Security-Pros and Cons.

TEXT BOOK:

1. Rajkumar Buyya, James Broberg, AndrZejGoscinski, Cloud Computing Principles and Paradigms, Wiley Publications,2013.

REFERENCE BOOKS:

1. Michael Miller, Cloud Computing – Web-Based Application That Change the Way You Work and Collaborate Online, Pearson Publications,2008.
2. Thomas Erl, Zaigham Mahmood, & Ricardo Puttini, Cloud Computing- Concepts, Technology & Architecture Pearson Publications,2013.
3. Kai Hwang, Geoffrey C.Fox. Jack J. Dongarra, Distributed and Cloud Computing – From Parallel Processing to the Internet of Things, 1st Edition, ELSEVIER Publications.



BIG DATA ANALYTICS
(Professional Elective - 3)

L	T	P	C
3	0	0	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

Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analyzing Data with UNIX tools, Analyzing Data with Hadoop, Hadoop Streaming, Hadoop Echo System.

UNIT-II:

HDFS (Hadoop Distributed File System)

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

UNIT-III:

Map Reduce

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

UNIT-IV:

Hadoop Eco System-I

Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.

Hive: Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

UNIT-V:

Hadoop Eco System-II

HBase: HBasics, Concepts, Clients, Example, Hbase versus RDBMS.

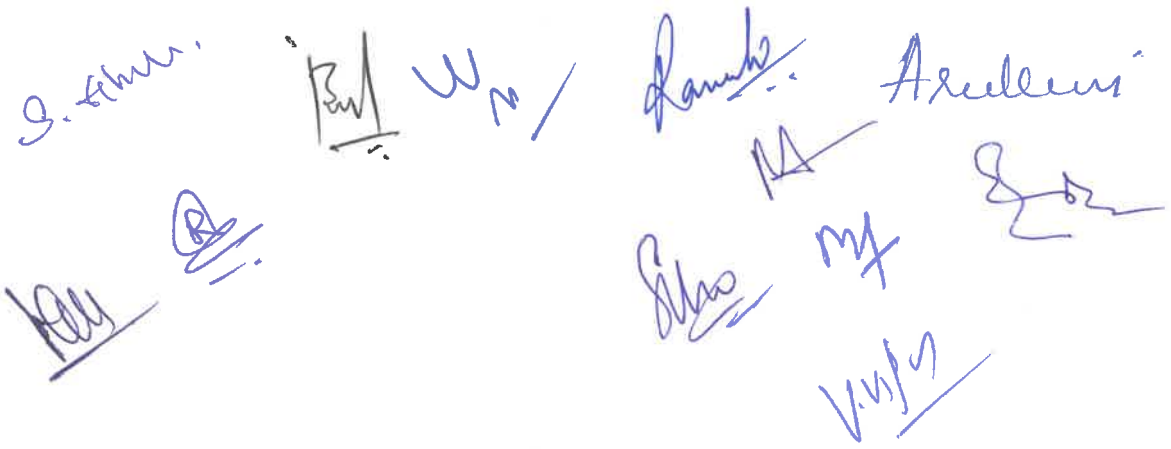
Zookeeper: The Zookeeper Services, Zookeeper in Production.

TEXT BOOK:

1. Tom White "Hadoop: The Definitive Guide" Third Edition, O'reily Media, 2012.
2. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.

REFERENCE BOOKS:

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Jay Liebowitz, "Big Data and Business Analytics" Auerbach Publications, CRC press (2013)
3. Tom Plunkett, Mark Hornick, "Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop", McGraw-Hill/Osborne Media (2013), Oracle press.



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

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

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, ArshdeepBahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.

REFERENCE BOOKS:

1. Getting started with the Internet of Things: connecting sensors and micro controllers to the cloud CUNO Pfister, O' Reily publications.
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

R PROGRAMMING
(Professional Elective - 3)

L	T	P	C
3	0	0	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:

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

Unit – II:

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

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

Unit – III:

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

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

Unit – IV:

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

Unit-V:

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

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

TEXT BOOK:

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

REFERENCE BOOKS:

1. K Beginning R: The Statistical Programming Language, Mark Gardener, Wrox.
2. Y. anchang Zhao, R and Data Mining: Examples and Case Studies. Elsevier December 2012.
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

L	T	P	C
3	0	0	3

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:

Terminology and Concepts, Applying statistics, Central Tendencies and Distributions, Variance, Distribution Properties and Arithmetic, Samples/CLT, Basic Machine Learning Algorithms, Linear Regression, SVM, Naive Bayes.

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 :

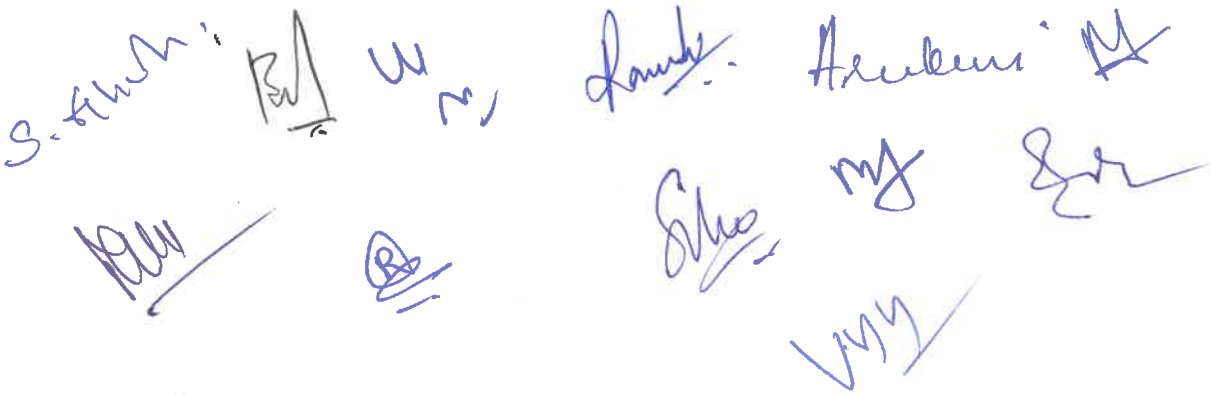
1. Cathy O'Neil, Rachel Schutt,"Doing Data Science, Straight Talk from The Frontline", 1st Edition, O'Reilly

2. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, "Introducing Data Science", Manning Publications Co., 1st Edition, 2016

REFERENCE BOOKS:

1. Jure Leskovek, AnandRajaraman, Jeffrey Ullman, "Mining of Massive Datasets", v2.1, Cambridge University Press, 2014.

2. Joel Grus, "Data Science from Scratch: First Principles with Python", O'Reilly, 1st Edition, 2015



ADVANCED DATABASES
(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT-I:

Introduction

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Design Issues.

UNIT-II:

Distributed DBMS Architecture: ANSI SPARC, Centralized DBMS Architecture, Architectural Models for Distributed DBMS.

Distributed Database Design: Top-Down Design Process, Distribution Design issues, Fragmentation, Allocation.

UNIT-III:

Introduction to RDBMS: Overview of Relational DBMS: Relational Database Concepts, Normalization, And Relational Data Languages.

Query Processing and Decomposition: Query Processing Objectives, Characterization of query processors, layers of query processing, query decomposition, Localization of distributed data.

UNIT–IV:

Distributed Query Optimization:Query optimization, centralized query optimization, Distributed query optimization algorithms.

Transaction Management: Definition, properties of transaction; types of transactions.

UNIT-V:

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

TEXT BOOKS:

1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez, 3rd Edition, Springer.
2. RaghuRamaKirshna,JohannesGehrk,DatabaseManagementSystemllTataMcGrawHi ll 3rd Edition.

REFERENCE BOOKS:

1 Distributed Databases Stefano Ceri and Willipse Pelagatti:, McGraw Hill.
2 M.Tamer OZSU and Pauck Valduriez: Principles of Distributed DatabaseSystems, Pearson Edn. Asia, 2001.
3 Henry F Korth, a Silberchatz and Sudershan: Database System Concepts. Tata MGH.

BLOCKCHAIN TECHNOLOGIES
(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

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:

Ethereum blockchain, The Ethereum Network, Components of Ethereum Ecosystem.
Current Landscape and what'snext: Emerging trends, Blockchain Research.

TEXT BOOKS:

1. Imran Bashir,Mastering Block chain, Packt Publishing,2018.
2. VikramDhillon, DavidMetcalf, MaxHooper, BlockchainEnabledApplications, Apress, 2017.

REFERENCE BOOKS:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).

MACHINE LEARNING
(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

Unit – I:

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

Unit II:

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

Unit III:

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

Unit – IV:

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

Unit – V:

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

IMAGE PROCESSING
(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

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:

Digital image fundamentals - Digital Image through scanner, digital camera. Concept of gray levels. Gray level to binary image conversion. Sampling and quantization. Relationship between pixels. Imaging Geometry.

UNIT-II:

Image Transforms 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform. Image enhancement Point processing. Histogram processing. Spatial filtering.

UNIT-III:

Enhancement in frequency domain, Image smoothing, Image sharpening. Color image processing: Pseudo color image processing, full color image processing.Image Restoration Degradation model, Algebraic approach to restoration, Inverse filtering, least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

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:

1 Digital Image processing R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education.

REFERENCE BOOKS:

1 Image Processing with Scilab and Image Processing Design Toolbox; Dr. Eng. (J) Harald Galda, 2011.
2 Fundamentals of Digital Image processing – A.K.Jain, PHI.
3 Digital Image processing using MAT LAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.

MOBILE APPLICATION DEVELOPMENT LAB

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

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

L	T	P	C
0	0	2	1

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 indexesii) 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

L	T	P	C
0	0	2	1

Course outcomes:

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

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

List of Experiments

Week 1:

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

Week 2:

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

Week 3:

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

Week 4:

5. Introduction to IoT & Sensor control with IFTTT.

Week 5:

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

Week 6:

8. Live Temperature and Humidity monitoring over Internet.

Week 7:

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

Week 8:

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

Week 9 & 10:

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

Week 11:

13. Home Automation System.

Week 12:

14. Build a Restful web service for IoT Management.

Week 13:

15. Build a web server for IoT Management

R PROGRAMMING LAB
(Professional Elective–3 LAB)

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

Course outcomes:

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

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

Week-1:
Installation and Environment set up R and Rstudio

Week-2:
Experiments on Vector Arithmetic operations

Week-3:
Experiments on Matrices operations

Week-4
Experiments on Arrays functions

Week-5:
Experiments on Factors

Week-6:
Experiments on Data Frames

Week-7:
Experiments on List operations

Week-8:
Write R scripts which demonstrate logical operations and Conditional Statements

Week-9:
Write R scripts which demonstrate Looping over List

Week-10:
Write R scripts which demonstrate Nested Functions and Function Scoping

Week-11:
Experiments on Mathematical Functions in R

Week-12:
Experiments on Calculus in R

Week13:
Experiments on Lapply, Sapply and Apply functions

Week-14:
Generate different Charts and Graphs using R

DATA SCIENCE LAB
(Professional Elective - 3 Lab)

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

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

L	T	P	C
0	0	0	3

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

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT-I:

Empowering the Information Age: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Today's Web, The Next Generation Web.

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

Berners-Lee: What is Solvable on the Web? : Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT-II:

Resource Description Framework: HTML Language, XML Language,RDF Language,Basic Elements, RDF Schema.

Web Ontology Language: Ontology Language,Ontology Language Requirements, Compatibility of OWL and RDF/RDFS, The OWL Language, Basic Elements, OWL Example: Compute Ontology,OWL Capabilities and Limitations.

UNIT-III:

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

UNIT-IV:

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

Semantic Search Technology: Search Engines, Semantic Search, Semantic Search Technology, Web Search Agents, Semantic Methods.

UNIT-V:

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

Electronic sources for network analysis: Electronic Discussion networks. Blogs and Online Communities, Web Based Networks.

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

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, Audi Studer, Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)

E – COMMERCE

B.Tech IV Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT-I:

Electronic Commerce

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

UNIT-II:

Electronic Payment Systems

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

UNIT-III:

Intra Organizational Commerce 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

Information search and Retrieval, Commerce Catalogues, Information Filtering. Multimedia – key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing's, Desktop video conferencing.

TEXT BOOK:

1. Frontiers of electronic commerce Kalakata, Whinston, Pearson Education, 2004

REFERENCE BOOKS:

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.

TECHNICAL SEMINAR

B.Tech IV Year II Semester

L	T	P	C
0	0	4	2

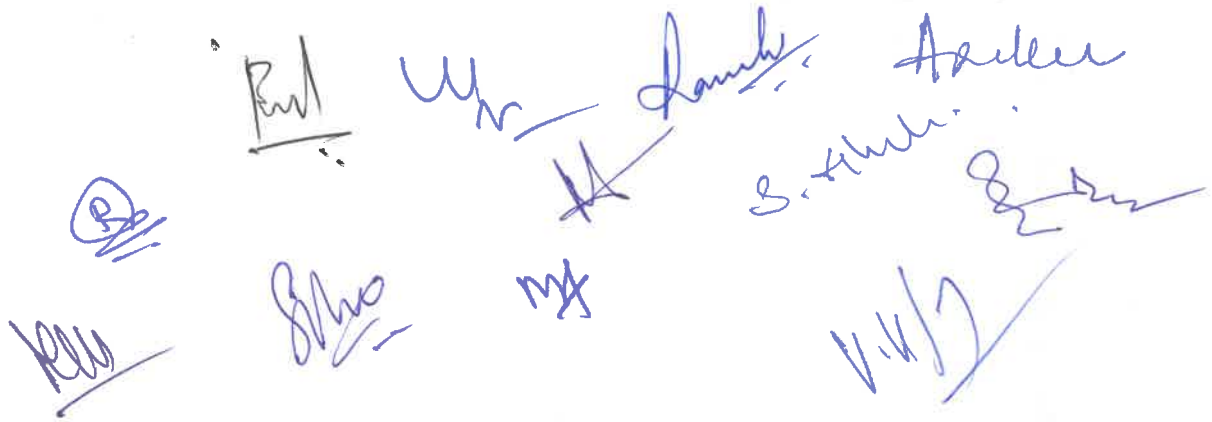
Course Outcomes:

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

L	T	P	C
0	0	0	2

COURSE OUTCOMES:

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 VivaVoce is evaluated by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

MAJOR PROJECT

B.Tech IV Year II Semester

L	T	P	C
0	0	20	10

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.

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Annexure -3

III Year – I Semester (Fast Track Curriculum Scheme)

S. No.	Category	Course Title	L	T	P	Credits
1	PC-9	Formal Languages and Automata Theory	3	0	0	3
2	PC-10	Computer Networks	3	0	0	3
3	PC-11	Operating Systems	3	0	0	3
4	PC-12	Web Technologies	3	0	0	3
5	PE-1	Principles of Programming Languages Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE – 1	Open Elective - I	3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	PC Lab	Web Technologies Lab	0	0	2	1
9	Value added course -1	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
Total			**20**	**0**	**4**	**21**

III Year – II Semester (Fast Track Curriculum Scheme)

S. No.	Category	Course Title	L	T	P	Credits
1	H&S-3	Managerial Economics and Financial Analysis	3	0	0	3
2	PC-13	Compiler Design	3	0	0	3
3	PC-14	Data Warehousing & Data Mining	3	0	0	3
4	PC-15	Artificial Intelligence	3	0	0	3
5	PE -2	Object Oriented Analysis & Design Information Security Software Testing Methodologies Information Retrieval Systems	3	0	0	3
6	OE - 2	Open Elective –II	3	0	0	3
7	PC Lab	Data mining & Case Tools Lab	0	0	2	1
8	H & S - Lab 3	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -2	Quantitative Methods & Logical Reasoning/ Personality Development & Behavioural Skills	2	0	0	1
10	PC-18	Semantic Web & Social Networks	3	0	0	3
Total			**23**	**0**	**4**	**24**

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

S. No.	Category	Course Title	L	T	P	Credits
1	PC-16	Mobile Application Development	3	0	0	3
2	PC-17	Cloud Computing	3	0	0	3
3	PE -3	Big Data Analytics Internet of Things R Programming Introduction to Data Science	3	0	0	3
4	PE-4	Advanced Databases Block-Chain Technologies Machine Learning Image Processing	3	0	0	3
5	OE-3	Open Elective-3	3	0	0	3
6	PC Lab	Mobile Application Development Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Internet of Things Lab R Programming Lab Data Science Lab	0	0	2	1
8	PW	Industry Oriented Mini Project	0	0	0	3
9	PC-19	E-Commerce	3	0	0	3
Total			**18**	**0**	**4**	**23**

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

S. No.	Category	Course Title	L	T	P	Credits
1	PW	Technical Seminar	0	0	4	2
2	PW	Comprehensive Viva Voce	0	0	0	2
3	PW	Major Project	0	0	20	10
Total			**0**	**0**	**24**	**14**

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Annexure -4

Annexure – 4

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
&
DEPARTMENT OF INFORMATION TECHNOLOGY

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

S. No.	Course Category	Course Title
1	Open Elective – 1 B.Tech III Yr I Sem	1. Basics of Operating Systems 2. Core Java Programming 3. Fundamentals of Computer Networks
2	Open Elective – 2 B.Tech III Yr II Sem	4. Database Management Systems 5. Software Engineering Fundamentals 6. Essentials of Python Programming
3	Open Elective – 3 B.Tech IV Yr I Sem	7. Web Design 8. Introduction to IOT 9. Fundamentals of Cyber Security

III Year B.Tech. CSE & IT - I Sem

L	T	P	C
3	0	0	3

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:

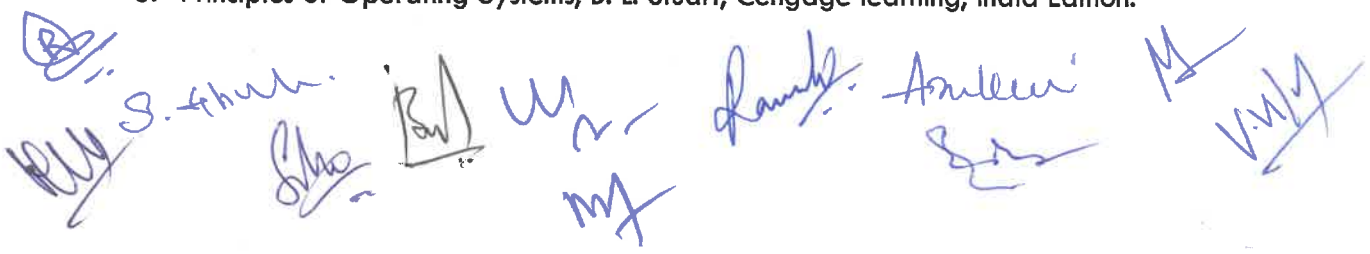
Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.
Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix.
Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication.

TEXT BOOKS:

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

REFERENCES BOOKS:

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



III Year B.Tech. CSE & IT - I Sem

L	T	P	C
3	0	0	3

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
AWT controls: Button, Label, TextField, TextArea, Checkbox, and CheckboxGroups, List, Choice, Layout Managers - Flow, Border, Grid, Card and Gridbag
Applets: Concepts of Applets, Differences between Applets and Applications, Life Cycle of an Applet, Creating Applets, Passing Parameters to Applets.

TEXT BOOKS:

1. Java the Complete Reference, 7th Editon, Herbert Schildt, TMH.
2. Understanding OOP with Java Updated Edition, T. Budd, Pearson Education.

REFERENCE BOOKS:

1. An Introduction to Programming and OO Design using Java, J.Nino and F.A. Hosch, John wiley & Sons.
2. An Introduction to OOP, Third Edition, T. Budd, Pearson Education.
3. Introduction to Java Programming, Y. Daniel Liang, Pearson Education.

III Year B.Tech. CSE & IT - I Sem

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

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.
Internetworking: IP addresses, IPv4, IPv6 Protocol.

UNIT - IV:
Transport Layer: Introduction to TCP and UDP, difference between TCP & UDP, The TCP Connection Management Modeling, The TCP Congestion Control.

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

REFERENCE BOOKS:
1. An Engineering Approach To Computer Networks-S.Keshav ,2nd Edition ,Pearson Education.
2. Understanding Communications And Networks,3rd Edition,W.A .Shay,Cengage Learning.
3. Introduction To Computer Networks And Cyber Security ,Chwan-Hwa(John)Wu,J.David Irwin, CRC Press.

III Year B.Tech. CSE & IT - II Sem

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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

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

UNIT-II

Introduction to Data base design , ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, 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

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

TEXT BOOKS:

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

REFERENCES BOOKS:

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

III Year B.Tech. CSE & IT - II Sem

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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. Indentify various testing techniques.
5. Examine various metrics for process and products.

UNIT-I:

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

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

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

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.

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

UNIT V:

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

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

TEXT BOOKS:

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

REFERENCES:

1. Software Engineering. A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGrawhill,2008.
3. Fundamentals of Software Engineering, Rajid Mall, PHI, 2005

III Year B.Tech. CSE & IT - II Sem

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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

Lists: Creating a List , Access Values, Updating Values in Lists, Nested Lists, Cloning Lists, Basic List Operations, List Methods, List Comprehensions, Looping in Lists

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.

Dictionaries: Creating a Dictionary, Accessing Values, Modifying an Entry, Deleting Items, Sorting Items in a Dictionary, Nested Dictionaries, Built-in Dictionary Functions and Methods.

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:

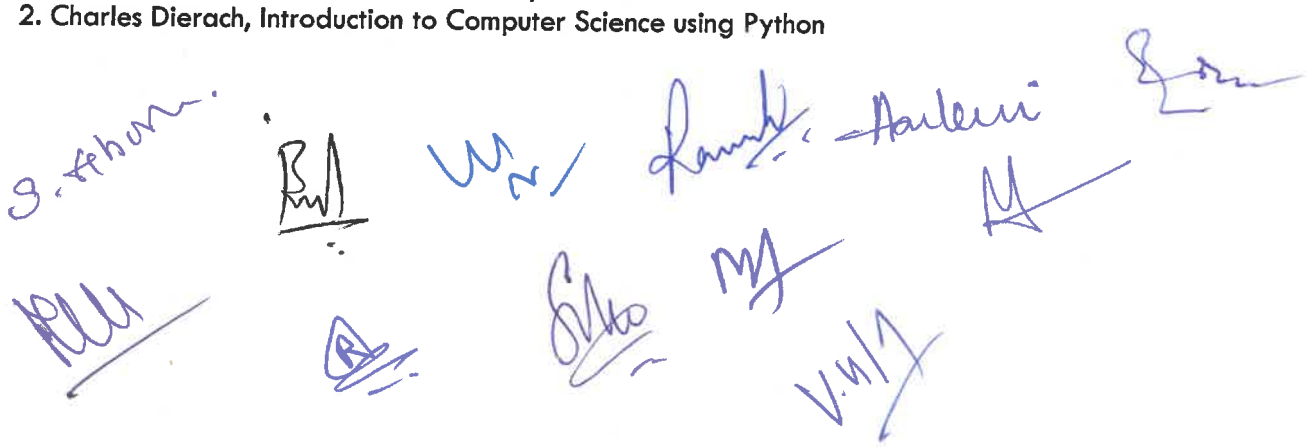
Introduction, Handling Exception, Multiple Exceptions in a single Except block,, Multiple Except Blocks and Multiple Exceptions, Finally Block.

Text Books

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

Reference Books

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



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

L	T	P	C
3	0	0	3

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

HTML basics tags - LIST – unordered list – nested and ordered list – Basic HTML Tables – Intermediate HTML table and Formatting – basic HTML Forms and Formatting –More Complex HTML Forms – Frames -Frameset Element – Nested Frameset, page layout and navigation.

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 Java Script, Dynamic HTML with Java Script, 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

1. Faithe Wempen,*"Microsoft Step by Step – HTML and XH"*, Prentice Hall of India Private Limited, New Delhi,2011.
2. The complete reference –PHP by Steven Holzner

REFERENCES

1. Achyut S Godbole&AtulKahate, *"WEB TECHNOLOGIES TCP/IP to Internet Applications Architectures"*, TMH 2007
2. Thomas A. Powell, McGraw-Hill *"HTML & CSS: The Complete Reference"*, Fifth Edition (Complete Reference Series) Osborne Media; 5 edition, 2010.
3. Java Server Pages -Hans

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

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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
Security Challenges: Data Exchange Security, Physical Security, Cloud Storage Security, Privacy Updates

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"

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

L	T	P	C
3	0	0	3

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

Forensic of Hand: Held Devices-Understanding cell phone working characteristics-Hand-Held devices and digital forensic- Toolkits for Hand-Held device-Forensic of i-pod and digital music devices-Techno legal Challenges with evidence from hand-held Devices.

Unit-V

Cyber Security: Organizational implications-cost of cybercrimes and IPR issues Web threats for organizations: the evils and Perils-Social media marketing Security and privacy Implications Protecting people privacy in the organizations Forensic best practices for organizations.

TEXT BOOK:

1. **Cyber Security:** *Understanding Cyber Crimes, Computer Forensics and Legal Perspectives*, Nina Godbole and Sunil Belapure, Wiley INDIA.

REFERENCE BOOK:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security , Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group

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Annexure -5

Vidya Jyothi Institute of Technology

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

List of Courses offered to other Departments (R20)

S. No.	Department	Course Title
1	ECE B.Tech II Yr I Sem	Object-Oriented Programming through Java
2	EEE B.Tech III Yr II Sem	Essentials of Computer Networks

OBJECT ORIENTED PROGRAMMING through JAVA
(For the Dept. of Electronics and Communication Engineering)

II B.Tech I Semester

L	T	P	C
3	0	0	3

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:

1. Herbert Schildt , The Complete Reference Java, Tata Mc Graw Hill, 2002
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
2. Budd T, An Introduction to Object Orient Programming, Pearson, 2008

ESSENTIALS OF COMPUTER NETWORKS

(For the Dept. of Electrical and Electronics Engineering)

B. Tech. III Year II Semester

L	T	P	C
3	0	0	3

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

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

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, subnetting

UNIT - IV:

Transport Layer: Introduction to TCP and UDP, difference between TCP & UDP, The TCP Connection Management Modeling, The TCP Congestion Control.

UNIT - V:

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

TEXT BOOKS:

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

REFERENCE BOOKS:

1. An Engineering Approach To Computer Networks-S.Keshav ,2nd Edition ,Pearson Education.
2. Understanding Communications And Networks,3rd Edition,W.A .Shay,Cengage Learning.
3. Introduction To Computer Networks And Cyber Security ,Chwan-Hwa(John)Wu,J.David Irwin, CRC Press.