Vidya Jyothi Institute of Technology
(An Autonomous Institution)
Aziznagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

Annexure -1

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)
Department of Information Technology

Annexure -1

R-20 Regulations of VJIT

B.TECH FIRST YEAR COURSE STRUCTURE

B.Tech I Year I Semester

S. No	Course Category	Course Title	L	T	P	Credits
1	B S-1	Mathematics - I	3	1	0	4.0
2	B S-2	Chemistry	3	1	0	4.0
3	BS Lab -1	Chemistry Lab	0	0	3	1.5
4	E S -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	E S-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**

B.Tech I Year II Semester

S. No	Course Category	Course Title	L	T	P	Credits
1	B S-3	Mathematics - II	3	1	0	4.0
2	B S-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	E S-4	Engineering Graphics & Modeling	1	0	3	2.5
		Total	11	2	10	18

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Department of Information Technology

B.TECH 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-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	Gender Sensitization/ Environmental Science / 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	Gender Sensitization / Environmental Science/ Cyber Law	2	0	0	0
		Total	**20**	**0**	**4**	**24**

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Department of Information Technology

B.TECH 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	H&S	Managerial Economics and Financial Analysis	3	0	0	3
5	PE-1	Cloud Computing Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE - 1	Open Elective - 1	3	0	0	3
7	PC Lab	Computer Networks & Operating Systems Lab	0	0	2	1
8	H & S Lab-3	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -1	Personality Development & Behavioural Skills/ Quantitative Methods & Logical Reasoning	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	PC - 12	Web Technologies	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	Object Oriented Analysis & Design	3	0	0	3
5	PE - 2	Artificial Intelligence Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	OE - 2	Open Elective - 2	3	0	0	3
7	PC Lab	Data Mining & Case Tools Lab	0	0	2	1
8	PC Lab	Web Technologies 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**

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Department of Information Technology

B.TECH 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	Internet of Things	3	0	0	3
3	PE - 3	Big Data Analytics Image Processing R Programming Introduction to Data Science	3	0	0	3
4	PE – 4	Machine Learning Blockchain Technologies Advanced Databases Information Retrieval Systems	3	0	0	3
5	OE - 3	Open Elective-3	3	0	0	3
6	PC Lab-7	Mobile Application Development Lab & IoT Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Image Processing Lab R Programming Lab Data Science Lab	0	0	2	1
8	P W	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 & Social Networks	3	0	0	3
2	PC - 19	E-Commerce	3	0	0	3
3	P W	Technical Seminar	0	0	4	2
4	P W	Comprehensive Viva-Voce	0	0	0	2
5	P W	Major Project	0	0	20	10
Total			**6**	**0**	**24**	**20**

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Annexure -2

B.TECH 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	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	Gender Sensitization/ Environmental Science/ 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	Gender Sensitization / Environmental Science/ 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:

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 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++ll, Aaron M. Tenenbaum, YedidyahLangsam and Moshe J. Augenstein PHI Learning Private Limited, Delhi India.
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:

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

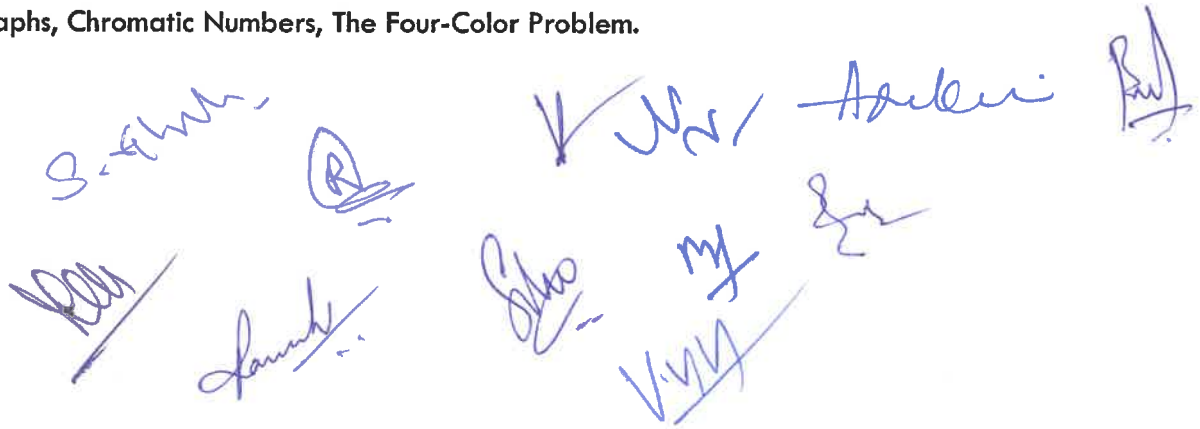
Relations and Digraphs:

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 Joe L. 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 Higher Education.
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:

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:

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
    b. In order b) Pre order c) Post order
5. Program to illustrate insertion, deletion and searching in Binary Search Tree.
6. Program to illustrate Insertion, deletion and Rotation on AVL Trees.
7. Program to illustrate Graph traversals
    a. Breadth First Search
    b. Depth First Search
8. Program to implement hash table using linear and quadratic probing.

Part- B

Exercise 1

a) Installation and Environment setup of python.
b) Write a program to demonstrate the use of basic Data Types
c) Write a program to demonstrate the Operators and Expressions
d) Write a program to demonstrate the Functions and parameter passing Techniques.

Exercise 2

a) Write a program to 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 3

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 4

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

Exercise 5

a) Write a program to implement Inheritance
b) Write a program to implement Polymorphism

Exercise 6

a) Write a program to implement Files

b) Write a program to Implement Exception Handling.

DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech II Year I Semester

L	T	P	C
4	0	0	4

Course Outcomes:

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 colouring, Hamiltonian cycles.

Branch and Bound:

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

UNIT V

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

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharan, Galgotia publications Pvt. Ltd.

References:

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

COMPUTER ORGANIZATION

B.Tech II Year II Semester

L	T	P	C
3	0	0	3

Course outcomes:

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

UNIT - I

Introduction to computer organization:

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

Addressing modes:

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

UNIT - II

CPU-Organization:

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

UNIT - III

CPU and Main Memory interface:

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

Micro-programmed control:

Control memory, address sequencing, micro program example and design of control unit.

UNIT - IV

Memory Organization:

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

I/O interface:

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

DMA:

DMA Controller, DMA Transfer, Intel 8089 IOP.

UNIT - V

Multi Processors: Characteristics of Multi Processor;

Interconnection structures:

Time shared common bus, multiport memory, crossbar switch, multi-stage switching network;

Introduction to Flynn's classification:

SISD, SIMD, MISD, MIMD (Introduction).

Text Books:

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

Reference Books:

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

JAVA PROGRAMMING

B.Tech II Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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 and 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 I/O.

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

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

UNIT - IV

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

AWT controls:

Labels, Button, Scrollbar, Text Components, Checkbox, CheckboxGroup, Choice, List, Panes – ScrollPane, Dialog and Menu Bar.

Event Handling:

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

UNIT - V

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

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

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

Text Books:

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. Programming in JAVA, Second Edition, OXFORD Higher Education.
2. Thinking in Java Fourth Edition, Bruce Eckel
3. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
4. 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:

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.

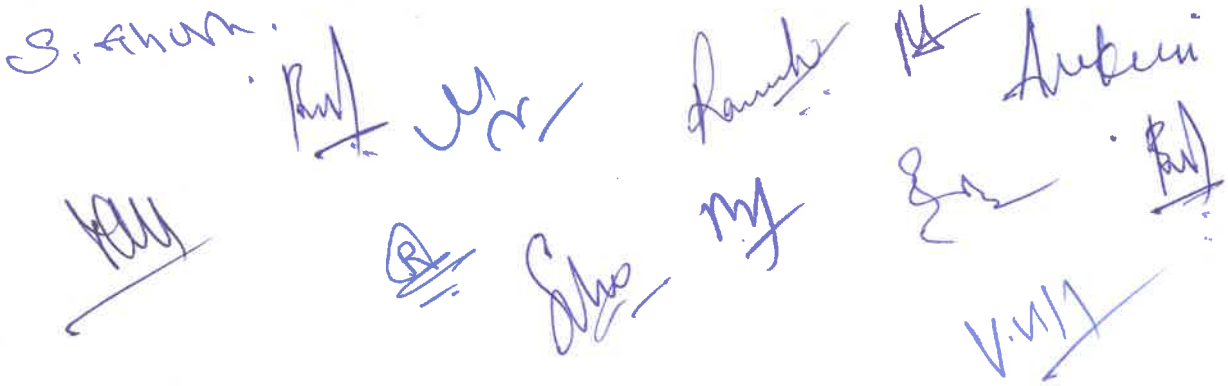
Quality Management: Quality concepts, Software Reviews, Formal technical reviews, Software reliability, The ISO 9000 quality standards.

Text Books:

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

References Books:

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



DATABASE MANGEMENT SYSTEMS

B.Tech II Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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, 6th Edition, Tata McGraw-Hill.
2. Raghu Rama Kirshna, Johannes Gehrk, Database Management Systemll Tata McGraw Hill 3rd Edition.

Reference Books:

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

JAVA PROGRAMMING LAB

B.Tech II Year II Semester

L	T	P	C
0	0	2	1

Course Outcomes:

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

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

Week 4 & 5

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

Week 6 & 7

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

Week 8 & 9:

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

Week 10 & 11

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

Week 12:

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

Week 13

21. Write a program to illustrate JDBC.

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 integrityconstraints.
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 Libraryscenario

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 –Mondayl

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 (IT) 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	H&S	Managerial Economics and Financial Analysis	3	0	0	3
5	PE-1	Cloud Computing Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE – 1	Open Elective - 1	3	0	0	3
7	PC Lab-4	Computer Networks & Operating Systems Lab	0	0	2	1
8	H & S	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -1	Personality Development & Behavioural Skills/ Quantitative Methods & Logical Reasoning	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	PC – 12	Web Technologies	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	Object Oriented Analysis & Design	3	0	0	3
5	PE - 2	Artificial Intelligence Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	OE – 2	Open Elective – 2	3	0	0	3
7	PC Lab -6	Data Mining & Case Tools Lab	0	0	2	1
8	PC Lab-5	Web Technologies 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**

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Department of Information Technology

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	H&S-3	Managerial Economics and Financial Analysis	3	0	0	3
5	PE-1	Cloud Computing Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE - 1	Open Elective – 1	3	0	0	3
7	PC Lab-4	Computer Networks & Operating Systems Lab	0	0	2	1
8	H & S Lab-3	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -1	Personality Development & Behavioural Skills / Quantitative Methods & Logical Reasoning	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	PC-12	Web Technologies	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	Object Oriented Analysis & Design	3	0	0	3
5	PE -2	Artificial Intelligence Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	OE - 2	Open Elective – 2	3	0	0	3
7	PC Lab -6	Data Mining & Case Tools Lab	0	0	2	1
8	PC Lab-5	Web Technologies 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.

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:

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.

Data Link Layer:

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

UNIT - II

Multiple Access Protocols:

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

UNIT - III

Network Layer:

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

UNIT - IV

Internetworking:

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

Transport Layer:

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

UNIT - V

The Internet Transport Protocols:

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

Application Layer:

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

Text Books:

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

Reference Books:

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

OPERATING SYSTEMS

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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:

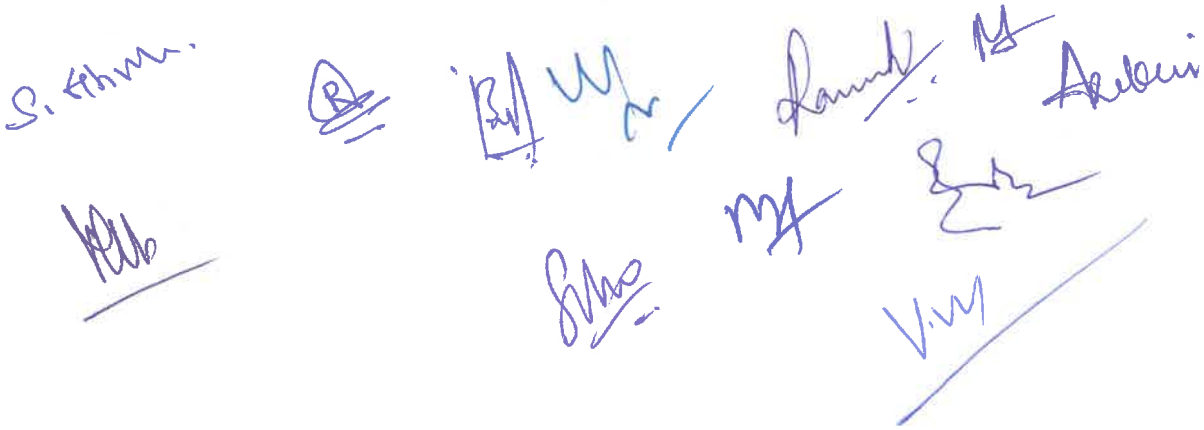
System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

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.



CLOUD COMPUTING
(Professional Elective - 1)

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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, ELSEVIER Publications-First Edition.

LINUX PROGRAMMING
(Professional Elective-1)

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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:

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 Book:

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)

B.Tech III Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

UNIT-I

Introduction

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

Output Primitives

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

UNIT-II

2D Geometrical Transformations

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

2D Viewing

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

UNIT-III

3D Object Representation

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

3D Geometric transformations

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

UNIT-IV

Visible Surface Detection Methods:

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

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

UNIT-V

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

Text Book:

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

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.

ADVANCED COMMUNICATION SKILLS (ACS) LAB

B.Tech III Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

1. Develop sound communication skills in various situations with the help of enriched vocabulary.
2. Practice reading techniques for a faster and better comprehension.
3. Exhibit strong writing skills to express ideas effectively.
4. Demonstrate effective presentation skills.
5. Use appropriate verbal and non-verbal skills for a successful career.

UNIT-I:

Activities on Fundamentals of inter-personal Communication and Building Vocabulary Starting a conversation responding appropriately and relevantly using the right body language Role Play in different situations & Discourse Skills using visuals Synonyms and antonyms, word roots, one word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations & usage of vocabulary.

UNIT-II:

Activities on Reading Comprehension General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.

UNIT-III:

Activities on Writing Skills Structure and presentation of different types of writing letter writing/ Resume writing/ Statement of purpose - E-correspondence/ Technical report writing / Portfolio writing planning for writing improving one's writing.

UNIT-IV:

Activities on Presentation Skills Oral presentations (individual and group) through JAM sessions/seminars/PPTs and written presentations through posters/projects/reports/e-mails/assignments etc.

UNIT-V:

Activities on Group Discussion and interview Skills Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation. Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference & video conference and Mock Interviews.

Reference Books:

1. Technical Communication by Meenakshi Raman &Sangeeta Sharma, Oxford University, 2nd Edition, 2011.
2. Functional English for Success, Orient Longman, 2014.

WEB TECHNOLOGIES

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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'Really.

COMPILER DESIGN

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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 reduce parser, 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:

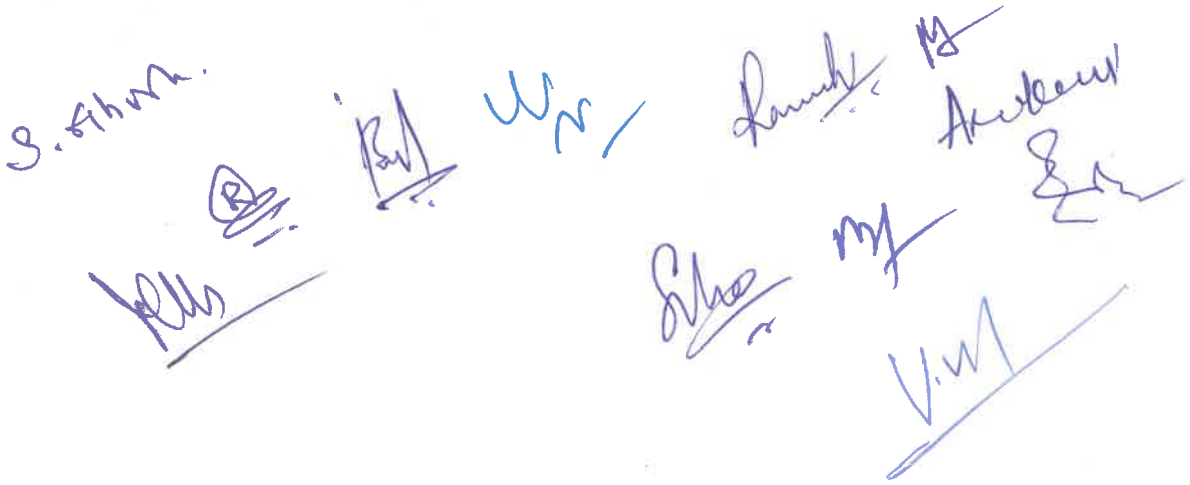
Object programs, problems in Code generation, A Machine Model, A Simple Code generator, Register allocation and assignment, Peephole optimization.

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:

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.
3. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley student Edition.

OBJECT ORIENTED ANALYSIS & DESIGN

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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 Unified Modeling Language Construct for Developing Structural Design of an ATM Project.

UNIT – I

Introduction to UML:

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

UNIT – II

Basic Structural Modeling:

Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling:

Advanced classes, advanced relationships, Interfaces, Packages.

Class & Object Diagrams:

Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT – III

Basic Behavioral Modeling-I:

Interactions, Interaction diagrams.

Basic Behavioral Modeling-II:

Use cases, Use case Diagrams, Activity Diagrams.

UNIT – IV

Advanced Behavioral Modeling:

Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT – V

Architectural Modeling:

Component, Deployment, Component diagrams and Deployment diagrams

Case Study: The Unified library application, ATM System.

Text Books:

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

Reference Books:

1. Analysis and 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.

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.

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)-2007
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:

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, designand 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.

PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective - 2)

B.Tech III Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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:

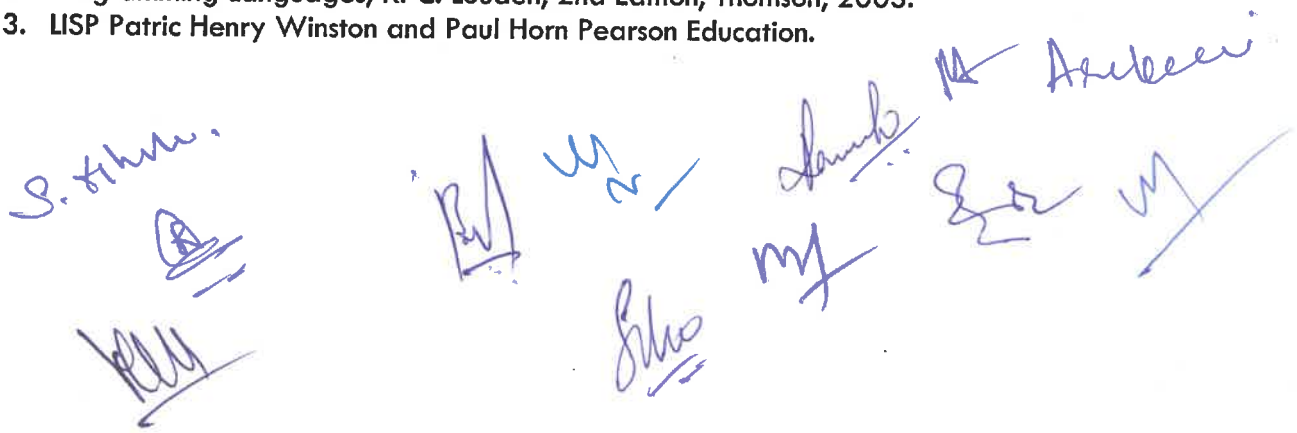
Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Text Books:

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



DATA MINING & CASE TOOLS LAB

B.Tech III Year II Semester

L	T	P	C
0	0	2	1

Course outcomes:

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.

WEB TECHNOLOGIES LAB

B.Tech III Year II Semester

L	T	P	C
0	0	2	1

Course Outcomes:

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.

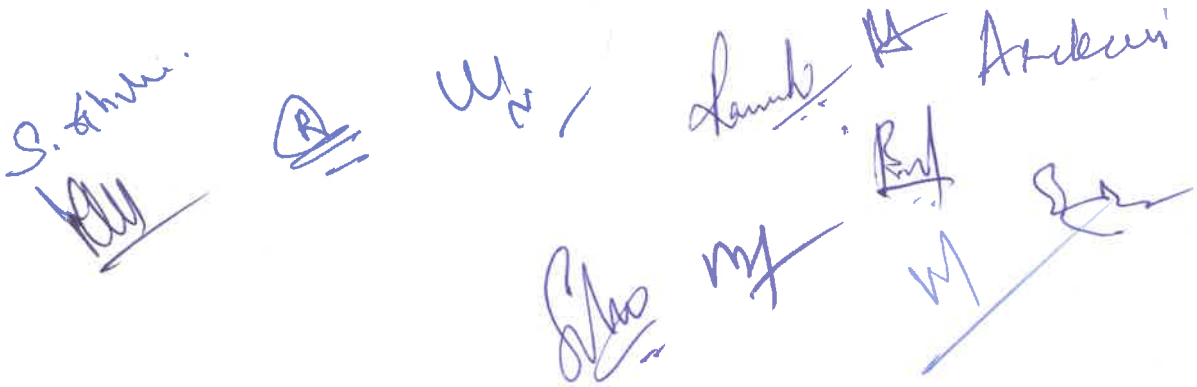
Week 12:
Write a servlet program for authenticating users for the above program.

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.



B.TECH 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	Internet of Things	3	0	0	3
3	PE - 3	Big Data Analytics Image Processing R Programming Introduction to Data Science	3	0	0	3
4	PE – 4	Machine Learning Blockchain Technologies Advanced Databases Information Retrieval Systems	3	0	0	3
5	OE - 3	Open Elective-3	3	0	0	3
6	PC Lab-7	Mobile Application Development Lab & IoT Lab	0	0	2	1
7	PE-3 Lab	Big Data Analytics Lab Image Processing Lab R Programming Lab Data Science Lab	0	0	2	1
8	P W	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 & Social Networks	3	0	0	3
2	PC - 19	E-Commerce	3	0	0	3
3	P W	Technical Seminar	0	0	4	2
4	P W	Comprehensive Viva-Voce	0	0	0	2
5	P W	Major Project	0	0	20	10
Total			**6**	**0**	**24**	**20**

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	Internet of Things	3	0	0	3
3	PE -3	Big Data Analytics Image Processing R Programming Introduction to Data Science	3	0	0	3
4	PE-4	Machine Learning Blockchain Technologies Advanced Databases Information Retrieval Systems	3	0	0	3
5	OE-3	Open Elective-3	3	0	0	3
6	PC Lab -7	Mobile Application Development Lab & IoT Lab	0	0	2	1
7	PE - 3 Lab	Big Data Analytics Lab Image Processing Lab R Programming Lab Data Science	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	10	23

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

INTERNET OF THINGS

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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. Designing The Internet of Things, Adrian McEwen, Hakim Cassimally, John Wiley and Sons, Ltd

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

3. IOT (Internet of Things) Programming: A Simple and Fast Way of Learning IOT, kindle edition.

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.

IMAGE PROCESSING
(Professional Elective - 3)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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.

References:

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.

R PROGRAMMING
(Professional Elective - 3)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

Unit – I

Basics of R:

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

Unit – II

Factors and Data Frames:

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

Lists:

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

Unit – III

Iterative Programming in R:

Introduction, While Loop, For Loop, Looping Over List.

Functions in R:

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

Unit – IV

Apply Family in R:

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

Unit-V

Data Interfaces:

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

Statistical Applications:

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

Text Books:

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

References:

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

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. Analyze various data collection and visualization techniques

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", 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

MACHINE LEARNING

(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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

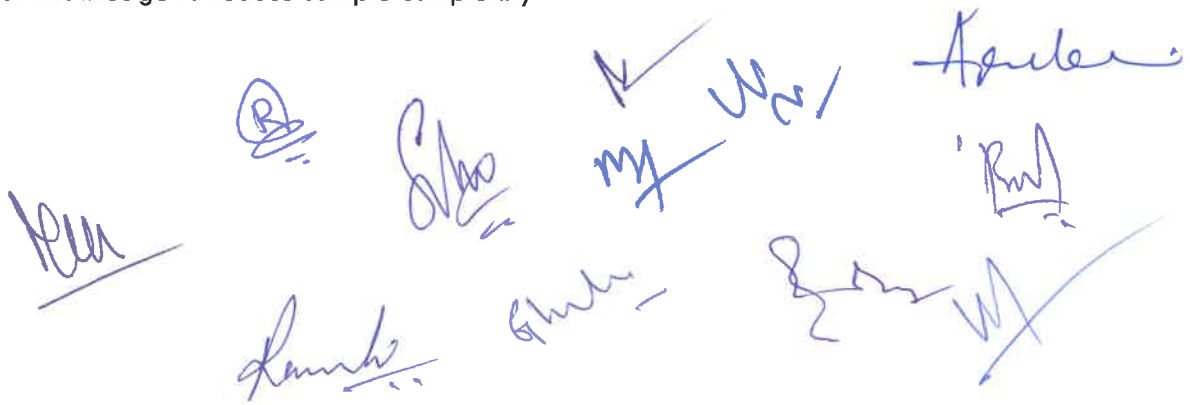
Sample Complexity and Over fitting And Bayesian Approaches: Introduction to Sample Complexity and Over fitting, Errors in estimating means, Cross Validation and Jackknifing VC Dimension, Irrelevant features, Multiplicative rules for Weight tuning, Introduction to Bayesian Approaches, The basics Expectation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

BLOCKCHAIN TECHNOLOGIES
(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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's next: Emerging trends, Blockchain Research.

Text Books:

1. Imran Bashir, Mastering Block chain, Packt Publishing, 2018.
2. VikramDhillon, David Metcalf, 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).

ADVANCED DATABASES
(Professional Elective - 4)

B.Tech IV Year I Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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. Identify different Parallel DBMS Techniques based on given constraints.

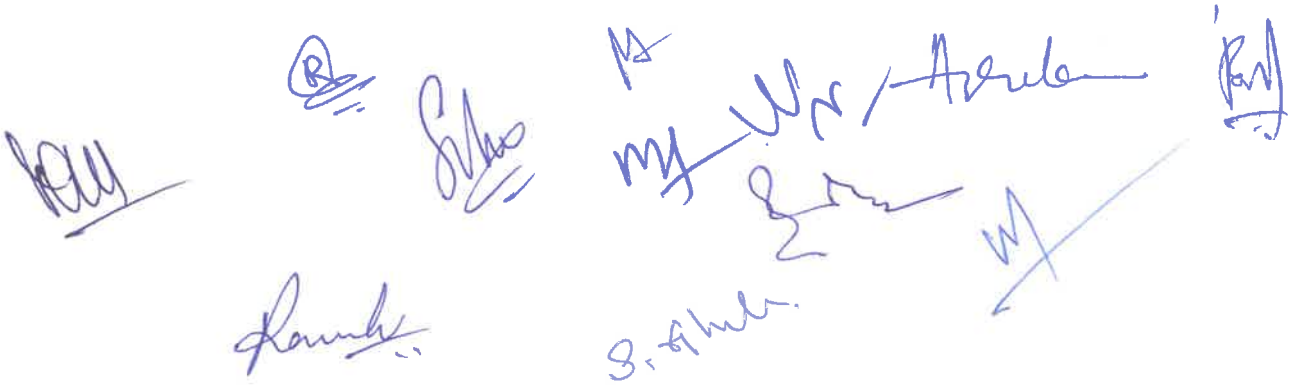
UNIT-I
Introduction
Distributed Data Processing, Distributed Database System, Promises of DDBSs, Design Issues.

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, 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. Raghu Rama Kirshna, Johannes Gehrk, Database Management Systemll Tata McGraw Hill 3rd Edition.

Reference Books:

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

INFORMATION RETRIEVAL SYSTEMS
(Professional Elective – 4)

B.Tech IV Year I 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 Books:

1. David A. Grossman, Ophir Frieder, information Retrieval —Algorithms and Heuristics, Springer, 2nd Edition (Distributed by Universities Press), 2004.

Reference Books:

1. Gerald J Kowaiski, Mark T Maybury. Information Storage and Retrieval Systems, Springer, 2000

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

MOBILE APPLICATION DEVELOPMENT & INTERNET OF THINGS LAB

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

Course outcomes:

1. Ability to develop GUI based Android applications.
2. Ability to develop event based Android applications.
3. Design Android applications that can access database.
4. Apply the concepts of IoT by identifying different related technologies.
5. Apply IoT to different applications by evaluating IoT protocols.
6. Design and develop smart IoT solutions by analyzing the data received from sensors.

Mobile Application Development Lab

Week 1:

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

Week 2:

Create a native calculator application.

Week 3:

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

Week 4:

Develop a native application that uses GPS location information.

Week 5:

Develop an application that creates notification upon receiving a message.

Week 6:

Create an alarm clock mobile application.

Internet of Things Lab

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

Week 6:

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

BIG DATA ANALYTICS LAB
(Professional Elective – 3 Lab)

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

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

LIST OF EXPERIMENTS

Week 1, 2:

1. Implement the following Data structures in Java
a) Linked Lists b) Stacks c) Queues d) Set e) Map

Week 3

2. Perform setting up and Installing Hadoop in Pseudo distributed mode

Week 4:

3. Implement the following file management tasks in Hadoop:
i. Adding files and directories
ii. Retrieving files
iii. Deleting files
Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

Week 5:

4. Run a basic Word Count Map Reduce program to understand Map-Reduce Paradigm.

Week 6:

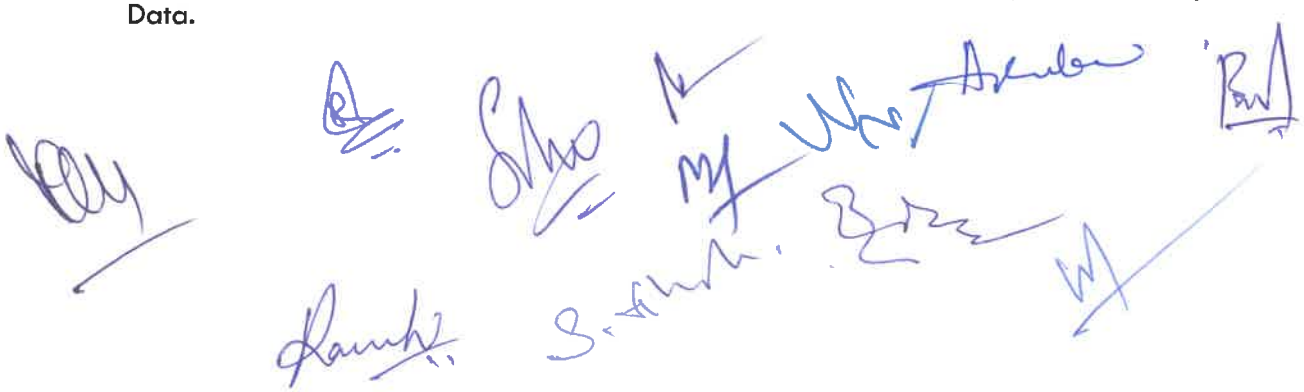
5. Write a Map Reduce program that mines weather data.
Weather sensors collecting data every hour at many locations across the globe gather a Large volume of log data, which is a good candidate for analysis with Map-Reduce, since it is semi structured and record-oriented.

Week 7:

6. Implement Matrix Multiplication with Hadoop Map Reduce

Week 8, 9:

7. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your Data.



Week 10, 11:

8. i) Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, Functions and indexes
   ii) Performance techniques in Hive partitions, bucketing.

Week 12:

9. Migration from Mysql database to hive using Sqoop

IMAGE PROCESSING LAB
(Professional Elective - 3 Lab)

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

Course Outcomes:

1. Understand and apply mathematical transforms necessary for image processing.
2. Implement Edge detection and filtering techniques.
3. Implement Image Enhancement and Fourier Transformation techniques
4. Develop segmentation Techniques.

List of Experiments

1. Display of Grayscale Images.
2. Histogram Equalization.
3. Non-linear Filtering.
4. Edge detection using Operators.
5. 2-D DFT and DCT.
6. Filtering in frequency domain.
7. Display of color images.
8. Conversion between color spaces.
9. DWT of images.
10. Segmentation using watershed transform.

R PROGRAMMING LAB
(Professional Elective - 3 Lab)

B.Tech IV Year I Semester

L	T	P	C
0	0	2	1

Course outcomes:

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

LIST OF EXPERIMENTS

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

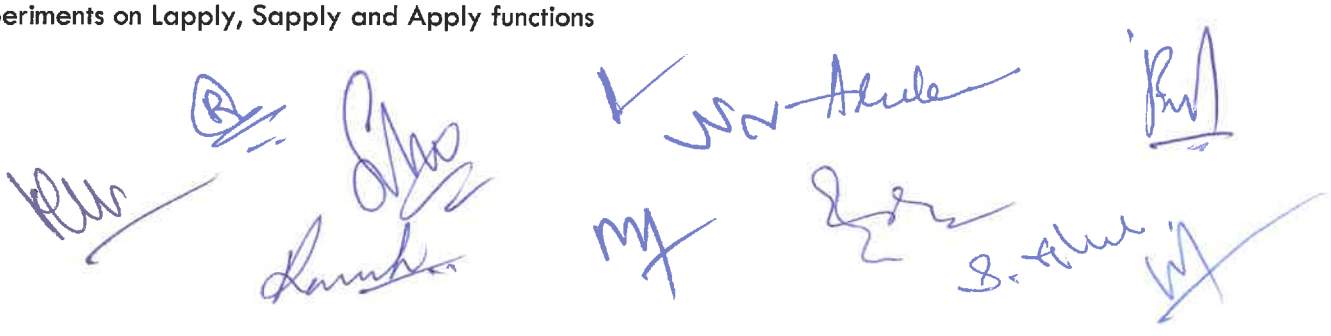
Week-9:
Write R scripts which demonstrate Looping over List

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:

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

UNIT-I

Empowering the Information Age :

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

Turing: What is Machine Intelligence? :

Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents.

Berners-Lee: What is Solvable on the Web? :

Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT-II

Resource Description Framework:

HTML Language, XML Language,RDF Language,Basic Elements, RDF Schema.

Web Ontology Language:

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

UNIT-III

Ontology Engineering:

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

UNIT-IV

Logic, Rules, Inference & Semantic Web Applications:

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

Semantic Search Technology:

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

UNIT-V

Social Network Analysis:

What is Networks analysis, Development of the social networks analysis.

Electronic sources for network analysis:

Electronic Discussion networks. Blogs and Online Communities, Web Based Networks.
Developing social-semantic applications: Building Semantic Web Applications with social network features, Semantic Web Architecture.

Text Books:

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

Reference Books:

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

E – COMMERCE

B.Tech IV Year II Semester

L	T	P	C
3	0	0	3

Course Outcomes:

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.

References 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:

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

METHOD OF EVALUATION:

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

MAJOR PROJECT

B.Tech IV Year II Semester

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Department of Information Technology

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	H&S-3	Managerial Economics and Financial Analysis	3	0	0	3
5	PE-1	Cloud Computing Linux Programming Software Project Management Computer Graphics	3	0	0	3
6	OE - 1	Open Elective – 1	3	0	0	3
7	PC Lab-4	Computer Networks & Operating Systems Lab	0	0	2	1
8	H & S Lab-3	Advanced Communication Skills Lab	0	0	2	1
9	Value added course -1	Personality Development & Behavioural Skills / Quantitative Methods & Logical Reasoning	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	PC-12	Web Technologies	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	Object Oriented Analysis & Design	3	0	0	3
5	PE -2	Artificial Intelligence Information Security Software Testing Methodologies Principles of Programming Languages	3	0	0	3
6	OE - 2	Open Elective – 2	3	0	0	3
7	PC Lab -6	Data Mining & Case Tools Lab	0	0	2	1
8	PC Lab-5	Web Technologies 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**

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
(An Autonomous Institution)
Department of Information Technology
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	Internet of Things	3	0	0	3
3	PE -3	Big Data Analytics Image Processing R Programming Introduction to Data Science	3	0	0	3
4	PE-4	Machine Learning Blockchain Technologies Advanced Databases Information Retrieval Systems	3	0	0	3
5	OE-3	Open Elective-3	3	0	0	3
6	PC Lab -7	Mobile Application Development Lab & IoT Lab	0	0	2	1
7	PE - 3 Lab	Big Data Analytics Lab Image Processing 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

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