VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

Aziz Nagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.

COURSE STRUCTURE & SYLLABUS

R-22

For

B. Tech (Computer Science and Engineering)

B. TECH FIRST YEAR COURSE STRUCTURE

B.Tech I Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A221001	Mathematics-I (Linear Algebra and Calculus)	3	1	0	4.0
2	A221004	Engineering Chemistry	3	1	0	4.0
3	A221083	Engineering Chemistry Lab	0	0	2	1.0
4	A221202	Basic Electrical Engineering	2	0	0	2.0
5	A221281	Basic Electrical Engineering Lab	0	0	2	1.0
6	A221302	Engineering Graphics & Modelling	1	0	4	3.0
7	A221503	Elements of Computer Science & Engineering	0	0	2	1.0
8	A221502	Programming for Problem Solving	3	0	0	3.0
9	A221582	Programming for Problem Solving Lab	0	0	2	1.0
10		Induction Programme				
		Total	**12**	**2**	**12**	**20**

B.Tech I Year II Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A222005	Mathematics-II (Ordinary Differential Equations & Vector Calculus)	3	1	0	4.0
2	A222007	Applied Physics	3	1	0	4.0
3	A222085	Applied Physics Lab	0	0	3	1.5
4	A222008	English for Skill Enhancement	2	0	0	2.0
5	A222086	English Language & Communication Skills Lab	0	0	2	2.0
6	A222402	Electronic Devices and Circuits	2	0	0	2.0
7	A222583	Python Programming Lab	0	2	2	3.0
8	A222382	Engineering Work Shop	0	1	3	2.5
		Total	**12**	**2**	**12**	**20**

B. TECH SECOND YEAR COURSE STRUCTURE

B.Tech II Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A223510	Mathematical Foundations of Computer Science	3	0	0	3
2	A223504	Data Structures	3	0	0	3
3	A223009	Probability & Statistics	3	1	0	4
4	A223505	Computer System Architecture	3	0	0	3
5	A223506	Database Management Systems	3	0	0	3
6	A223584	Data Structures Lab	0	0	2	1
7	A223585	Database Management Systems Lab	0	0	2	1
8	A223588	Skill development Course (Data Visualization - R Programming)	0	0	2	1
9	A223013	Quantitative Methods & Logical Reasoning	2	0	0	1
		Total	**17**	**1**	**6**	**20**

B.Tech II Year II Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A224511	Design & Analysis of Algorithms	3	0	0	3
2	A224512	Operating Systems	3	0	0	3
3	A224513	Object Oriented Programming through Java	3	0	0	3
4	A224514	Software Engineering	3	0	0	3
5	A224515	Introduction to Artificial Intelligence	2	0	0	2
6	A224591	Operating Systems Lab	0	0	2	1
7	A224592	Object Oriented Programming through Java Lab	0	0	2	1
8	A2245P1	Real-time Application Oriented Project	0	0	4	2
9	A224597	Skill Development Course on Node JS	0	0	2	1
10	A224014	Professional Communication	2	0	0	1
		Total	**16**	**0**	**10**	**20**

B. TECH THIRD YEAR COURSE STRUCTURE

B. Tech III Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A225524	Formal Languages and Automata Theory	3	1	0	4
2	A225525	Computer Networks	3	1	0	4
3	A225526	Web technologies	3	0	0	3
4	A225527	**Professional Elective-I** DevOps	3	0	0	3
	A225528	Linux Programming	3	0	0	3
	A225529	Software Project Management	3	0	0	3
	A225530	Principles of Programming Languages	3	0	0	3
5	A225531	**Open Elective I** Basics of Operating Systems	3	0	0	3
	A225532	Core Java Programming	3	0	0	3
	A225533	Fundamentals of Computer Networks	3	0	0	3
6	A2255A0	Computer Networks Lab	0	0	2	1
7	A2255A1	Web technologies Lab	0	0	2	1
8	A2255A8	Skill Development Course (UI Designs-Flutter)	0	0	2	1
9	A225017	Gender Sensitization	2	0	0	0
		Total	**17**	**2**	**6**	**20**

B. Tech III Year II Semester

Sl. No	Course Category	Course Title	L	T	P	Credits
1	A226554	Data Warehousing and Data Mining	3	0	0	3
2	A226555	Complier Design	3	1	0	4
3	A22	Business Economics & Financial Analysis	3	0	0	3
4	A226556	**Professional Elective-II** Agile Methodologies	3	0	0	3
	A226557	Distributed Databases	3	0	0	3
	A226558	Object Oriented Analysis and Design	3	0	0	3
	A226559	Computer Vision	3	0	0	3
5	A226560	**Open Elective-II** Fundamentals of Database Management Systems	3	0	0	3
	A226561	Software Engineering Fundamentals	3	0	0	3
6	A2265B0	Data Warehousing and Data Mining Lab	0	0	2	1
7	A226088	Advanced English Communication Skills Lab	0	0	2	1
8	A2265P1	Industrial Oriented Mini Project / Internship	0	0	4	2
9	A226020	Environmental Science	2	0	0	0
		Total	**17**	**1**	**8**	**20**

B. TECH FOURTH YEAR COURSE STRUCTURE

B. Tech IV Year I Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A2275E7	Big Data Analytics	3	0	0	3
2	A2275E8	Cloud Computing and Security	3	0	0	3
3	A2275E9	**Professional Elective-III** Fundamentals of Machine Learning	3	0	0	3
	A2275F0	Internet of Things				
	A2275F1	Mobile Application Development				
	A2275F2	Deep Learning				
4	A2275F3	**Professional Elective – IV** Advanced Databases	3	0	0	3
	A2275F4	Information Security				
	A2275F5	Natural Language Processing				
	A2275F6	Block Chain Technologies				
5	A2275F7	**Open Elective-III** Web Design	3	0	0	3
	A2275F8	IoT and Applications				
	A2275F9	Fundamentals of Cyber Security				
6	A2275C2	Big Data Analytics Lab	0	0	2	1
7	A2275C3	**Professional Elective-III lab** Fundamentals of Machine Learning Lab	0	0	2	1
	A2275C4	Internet of Things Lab				
	A2275C5	Mobile Application Development Lab				
	A2275C6	Deep Learning Lab				
8	A2275PS1	Project Stage-I	0	0	6	3
		Total	**15**	**0**	**10**	**20**

B. Tech IV Year II Semester

Sl. No.	Course Category	Course Title	L	T	P	Credits
1	A2285J4	Semantic Web & Social Networks	3	0	0	3
2	A2285J5	Introduction to Data Science	3	0	0	3
3	A2285J6	E-Commerce	3	0	0	3
4	A2285PS2	Project Stage-II (Including Seminar)	0	0	22	9+2
		Total	**9**	**0**	**22**	**20**

Open Elective Courses offered By CSE

Open Elective – I

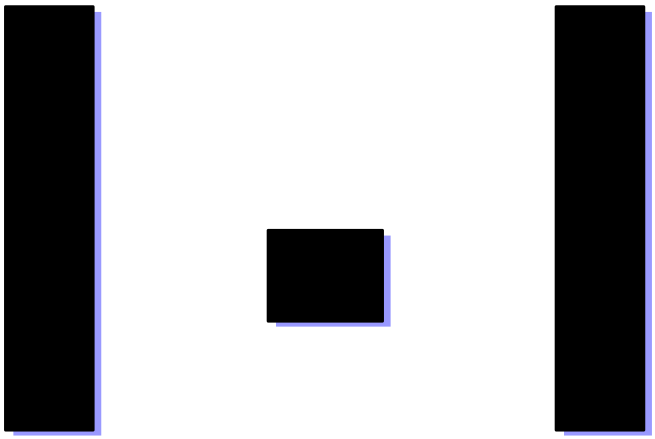
1. Basics of Operating Systems
2. Core Java Programming
3. Fundamentals of Computer Networks

Open Elective – II

1. Fundamentals of Database Management Systems
2. Software Engineering Fundamentals

Open Elective – III

1. Web Design
2. IoT and Applications
3. Fundamentals of Cyber Security



VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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MATHEMATICS-I (LINEAR ALGEBRA & CALCULUS)

B.Tech I Year I Semester
Course Code: A221001

L	T	P	C
3	1	0	4

Course Outcomes:

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

1. Write the matrix representation of system of linear equations and identify the consistency of the system of equations.
2. Find the Eigen values and Eigen vectors of the matrix and discuss the nature of the quadratic form.
3. Analyze the convergence of sequence and series.
4. Discuss the applications of mean value theorems to the mathematical problems, Evaluation of improper integrals using Beta and Gamma functions.
5. Examine the extrima of functions of two variables with/ without constraints.

UNIT-I

Matrices and Linear System of Equations:

Introduction of Matrices, Rank - Echelon form, Normal form. Solution of Linear Systems – Gauss Elimination and LU Decomposition methods.

UNIT-II

Eigen Values and Eigen Vectors:

Eigen values, Eigen vectors – properties, Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix- Quadratic forms: Nature, Index and Signature of the Quadratic Forms, Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

UNIT-III

Sequences & Series:

Basic definitions of Sequences and series, Convergence and divergence, Ratio test, Comparison test, Cauchy's root test, Raabe's test, Integral test, Absolute and conditional convergence.

UNIT-IV

Improper Integrals and Mean Value Theorems:

Improper Integrals: Gamma and Beta Functions-Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions.

Mean Value Theorems: Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, Generalized Mean Value theorem (Taylor's and MacLaurin's Series all theorems without proof) – Geometrical interpretation of Mean value theorems.

UNIT-V

Functions of several variables:

Partial Differentiation: Total derivative, Functional dependence, Jacobian Determinant- Maxima and Minima of functions of two variables with constraints and without constraints, Method of Lagrange Multipliers.

TEXT BOOKS:

1. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers, 36th Edition, 2010
2. Advanced Engineering Mathematics by Jain &Iyengar Narosa Publications.

REFERENCE BOOKS:

1. Calculus and Analytic geometry by G.B. Thomas and R.L. Finney, 9th Edition, Pearson, Reprint, 2002.
2. Advanced Engineering Mathematics by Erwin Kreyszig, 9th Edition, John Wiley & Sons, 2006.
3. Advanced Engineering Mathematics (2nd Edition) Michael D. Greenberg

ENGINEERING CHEMISTRY

B.Tech I Year II Semester
Course Code: A221004

L	T	P	C
3	1	0	4

Course Outcomes:

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

1. Understand the basic properties of water and its usage in domestic and industrial purposes.
2. Acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
3. Learn the fundamentals and general properties of polymers and other engineering materials.
4. Acquire knowledge of various energy sources.
5. Apply the knowledge of engineering materials in daily life.

UNIT-I

Water and Its treatment:

Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and break - point chlorination. Defluoridation - Determination of F^- ion by ion- selective electrode method.

Boiler Troubles - Introduction. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion- exchange process. Desalination of Brackish water - Reverse osmosis.

UNIT-II

Battery Chemistry & Corrosion:

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of Zn-air and Lithium-ion battery. Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells.

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting

corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic

protection – Sacrificial anode & impressed current methods and Electroless plating.

UNIT-III

Polymeric materials:

Definition – Classification of polymers with examples – Types of polymerizations – addition and condensation polymerization with examples – Nylon 6:6, Terylene

Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC, Bakelite and Teflon.

Rubbers: Natural rubber and its vulcanization.

Synthetic Rubbers- Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokol rubber.

Conducting polymers: Characteristics and Classification with examples-mechanism of conduction in trans-polyacetylene and applications of conducting polymers.

Biodegradable polymers: Concept and advantages – Poly lactic acid and poly vinyl alcohol and their applications.

UNIT-IV

Energy Sources:

Introduction, Calorific value of fuel – HCV, LCV- Dulongs formula, Numerical problems. Classification- Solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Trans esterification and advantages.

UNIT-V

Engineering Materials:

Cement: Portland cement, its composition, setting and hardening.

Smart materials and their engineering applications

Shape memory materials- Poly L- Lactic acid. Thermo response materials- Poly acryl amides and Poly vinyl amides

Lubricants: Classification of lubricants with examples-characteristics of a good lubricant - mechanism of lubrication (thick film, thin film and extreme pressure)- properties of lubricants: viscosity, cloud point, pour point, flash point and fire point.

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpat rai Publishing Company, 2010
2. Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 201
3. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.

REFERENCE BOOKS:

1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015)
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi (2011)

ENGINEERING CHEMISTRY LABORATORY

B.Tech I Year I Semester
Course Code: A221083

L	T	P	C
0	0	2	1

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

1. Determination of parameters like hardness and Chloride content of water.
2. Determination of rate of corrosion of mild steel in various conditions.
3. To perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases.
4. To prepare polymers like Thiokol rubber and Nylon-6.
5. Estimation of Saponification value, Viscosity and Surface tension of lubricant oils.

Choice of 8-10 Experiments from the following:

1. **Volumetric Analysis:** Estimation of Hardness of water by EDTA Complexometry method.
2. **Corrosion:** Determination of rate of corrosion of mild steel in various conditions.
3. **Conductometry:**
   a. Estimation of the concentration of an acid by Conductometry.
   b. Estimation of the concentration of Mixture of acids by conductometry
4. **Potentiometry:**
   a. Estimation of the Concentration of an acid by potentiometry
   b. Estimation of the amount of Fe^{+2} by Potentiometry
5. **pH Metry:** Determination of an acid concentration using pH meter.
6. **Argentometry:** Estimation of Chloride content of water by argentometry
7. **Preparations:**
   a. Preparation of Thiokol rubber.
   b. Preparation Nylon – 6.

I. **Lubricants:**

1. Estimation of acid value of given lubricant oil.
2. Estimation of Viscosity of lubricant oil using Ostwald's Viscometer.
3. Estimation of Surface tension of lubricant oil using Stalagmometer

REFERENCE BOOKS:

1. Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I. Vogel, ELBS Publication

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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BASIC ELECTRICAL ENGINEERING

B.Tech I Year I Semester
Course Code: A221202

L	T	P	C
2	0	0	2

Course Outcomes:

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

1. Understand basic principles of electrical elements.
2. Apply the concepts of AC circuits to various elements and combinations.
3. Examine principle and tests of transformer.
4. Contrast the working of DC machines and induction motors.
5. Assess working principle of AC generator and electrical installations.

UNIT-I

Introduction to Electrical Engineering and DC Circuits:

Basic definitions, Ohm's law, types of elements, types of sources, Kirchhoff's laws, resistive networks-series, parallel circuits, delta- star and star- delta transformation, Network theorems- Superposition, Thevenin's - simple problems.

UNIT-II

AC Circuits: Representation of sinusoidal waveforms, peak, rms and average values. Phase representation of alternating quantities, analysis of AC circuits with single basic network element (R, L, C), single phase series circuits, concept of resonance, three-phase balanced circuits-voltage and current relations in star and delta connections.

UNIT-III

Transformers: Constructional details, principle of operation, ideal and practical single-phase transformer, losses in transformer, OC-SC tests, regulation and efficiency - simple problems.

UNIT-IV

Dc Machines And Induction Motors

DC Machines: Construction, principle and operation of DC motor, voltage- torque equations - simple problems.

Three Phase Induction Motor: Construction, principle and working of three phase induction motor, torque-slip characteristics-simple problems.

Single phase induction motor**-** Working principle.

UNIT-V

Ac Generator &Electrical Installation

Ac Generator: Construction, principle of operation of synchronous generator, EMF equation.

Electrical Installation: Fuse, circuit breakers, difference between fuse and circuit breaker, Types of batteries, battery backup.

TEXT BOOKS:

1. Basic Electrical Engineering - by T.K. Nagasarkar and M.S. Sukhija, Oxford University press.
2. Basic Electrical Engineering-by M.S. Naidu and S. Kamakshiah-TMH.

REFERENCE BOOKS:

1. Network Analysis by Sudhakar & Shyam Mohan.
2. Basic Electrical Engineering-by S.K. Bhattacharya, Pearson Publications.
3. Basic Electrical Engineering by K. Uma Rao and A. Jayalakshmi, IK Publications.

BASIC ELECTRICAL ENGINEERING LABORATORY

B.Tech I Year I Semester
Course Code: A221281

L	T	P	C
0	0	2	1

Course Outcomes:

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

1. Understand basic electrical laws.
2. Analyze the response of different types of electrical circuits to different excitations.
3. Apply electric laws and find out performance of various electrical machines.
4. Assess the losses in electrical machines.
5. Evaluate the performance of Electrical Circuits and Electrical Machines.

List of Experiments/ Demonstrations:

Any 5 experiments from Part-A and Part-B should be conducted (Total 10 Experiments)

Part-A

1. Verification of Ohms law.
2. Verification of KVL and KCL.
3. Verification of Thevenin's Theorem.
4. Verification of Superposition Theorem.
5. Transient Response of Series R- L and R - C circuits using DC excitation .
6. Determination and Verification of Impedance and Current of RL and RC series circuits

Part-B

1. Transient Response of R-L-C Series circuit using DC excitation .
2. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation).
3. OC & SC Test on Single phase transformer.
4. Brake test on DC shunt motor.
5. Brake test on Three Phase Squirrel cage induction motor.
6. OCC of Three phase alternator.

REFERENCE BOOKS:

1. Sudhakar and Shyam Mohan, "Circuits and Networks" Tata Mc Graw Hill Companies.
2. P.S.Bimbra, "Electrical Machines", Khanna Publishers.

ENGINEERING GRAPHICS & MODELING

B.Tech I Year I Semester
Course Code: A221302

L	T	P	C
1	0	4	3

Course Outcomes:

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

1. Comprehend the concepts of engineering drawing and CAD software.
2. Conceptualize and draw the projections of points and straight lines.
3. Visualize and project different views of a planes and solids.
4. Evaluate the surfaces of solids developed for further processing in the engineering applications.
5. Generate isometric and corresponding orthographic views of any given component.

UNIT-I

Introduction To Engineering Drawing: Principles of engineering graphics and their significance, usage of drawing instruments, conic sections, including the rectangular hyperbola– general method only. Cycloid, Epicycloid, Hypocycloid. Scales – plain & diagonal only.

INTRODUCTION TO CAD: Introduction to CAD software and its importance, standard toolbar/menus and navigation tools used in the software.

UNIT-II

Principles Of Orthographic Projections: Conventions. Projections of points.

Projections Of Lines: (first angle projection) inclined to both planes (traces and midpoint problem to be excluded).

Implementation Of CAD: Drawing orthographic projections of points and lines using a CAD package.

UNIT-III

Projections Of The Planes: Projections of regular planes inclined to both the planes.

Projections Of Solids: Projections of regular solids inclined to both the planes (prisms, pyramids, cones and cylinders, Change of potion method only).

Implementation In CAD: Drawing orthographic projection of planes and regular solids using a CAD package.

UNIT-IV

Sections And Sectional Views Of Right Angular Solids: Prism, Cylinder, Pyramid, Cone.

Development Of Surfaces Of Right Regular Solids: Prism, Pyramid, Cylinder and Cone.
Implementation In CAD: Drawing sectional views of solids and the development of right regular solids using a CAD package.

UNIT-V

Principles Of Isometric Projection: Isometric scale, isometric views, conventions, isometric views of lines, planes, simple solids. Conversion of orthographic views to isometric views.
Orthographic Projections: conversion of isometric views to orthographic views.
Implementation In Cad: Drawing isometric views from giving orthographic views and vice-versa using a CAD package.

TEXT BOOKS:

1. Engineering Drawing, Bhatt N.D., Panchal V.M. & Ingle P.R.Charotar Publishing House

REFERENCE BOOKS:

1. **T**ext book on Engineering Drawing, Narayana, K.L. & P. Kannaiah, Scitech Publishers.
2. Engineering Drawing and Computer Graphics, Shah, M.B. & Rana B.C, Pearson Education.
3. http://docs.autodesk.com/ACDMAC/2013/ENU/PDFs/acdmac_2013_users_guide.pdf

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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ELEMENTS OF COMPUTER SCIENCE AND ENGINEERING

B.Tech I Year I Semester
Course Code: A221503

L	T	P	C
0	0	2	1

Course Outcomes:

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

1. Know the working principles of functional units of a basic Computer
2. Understand program development, the use of data structures and algorithms in problemsolving.
3. Know the need and types of operating system, database systems.
4. Understand the significance of networks, internet, WWW and cyber security.
5. Understand Autonomous systems, the application of artificial intelligence.

UNIT-I

Basics of a Computer – Hardware, Software, Generations of computers. Hardware - functional units, Components of CPU, Memory – hierarchy, types of memory, Input and output devices. Software – systems software, application software.

UNIT-II

Software development – waterfall model, Agile, Types of computer languages – Programming, markup, scripting Program Development – steps in program development, flowcharts, algorithms, datastructures – definition, types of data structures.

UNIT-III

Operating systems: Functions of operating systems, types of operating systems, Device & Resource management.

Database Management Systems: Data models, RDBMS, SQL, Database Transactions, datacenters,cloud basics & services.

UNIT-IV

Computer Networks: Advantages of computer networks, LAN, WAN, MAN, internet, WiFi, sensornetworks, 5G communication.

World Wide Web – Basics, role of HTML, CSS, XML, Tools for web designing, Social media, Online social networks.

UNIT-V

Autonomous Systems: IoT, Robotics, Drones, Artificial Intelligence – Learning, Game Development,image and video processing.

TEXT BOOKS:

1. Invitation to Computer Science, G. Michael Schneider, Macalester College, Judith L. Gersting University of Hawaii, Hilo, Contributing author: Keith Miller University of Illinois, Springfield.

REFERENCE BOOKS:

1. Fundamentals of Computers, Reema Thareja, Oxford Higher Education, Oxford University Press.
2. Introduction to computers, Peter Norton, 8th Edition, Tata McGraw Hill.
3. Computer Fundamentals, Anita Goel, Pearson Education India, 2010.
4. Elements of computer science, Cengage.

PROGRAMMING FOR PROBLEM SOLVING

B.Tech I Year I Semester
Course Code: A221502

L	T	P	C
3	0	0	3

Course Outcomes:

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

1. Write algorithms and to draw flowcharts for solving problems.
2. To understand the usage of control statements, arrays and strings.
3. Develop programs with user defined data types and pointers.
4. To decompose a problem into functions and to develop modular reusable code.
5. Analyze various Searching and sorting problems.

UNIT-I

Introduction to Programming: Compilers, compiling and executing a program.
Representation of Algorithm - Algorithms for finding roots of quadratic equations, finding minimum and maximum numbers of a given set, finding if a number is prime number Flowchart/ Pseudocode with examples, Program design and structured programming
Introduction to C Programming Language: variables (with data types and space requirements), Syntax and Logical Errors in compilation, object and executable code, Operators, expressions and precedence, Expression evaluation, type conversion
I/O: Simple input and output with scanf and printf, formatted I/O

UNIT-II

Control statements, Arrays and Strings:
Control statements: if, if-else, nested if else, else if ladder, switch-case, Iteration with for, while, do- while loops, break, continue.
Arrays: one and two dimensional arrays, creating, accessing and manipulating elements of arrays, basic searching and sorting algorithms using an array (Linear Search, Bubble Sort)
Strings: Introduction to strings, handling strings as array of characters, string manipulation without & with built-in functions (strlen(), strcat(), strcpy(), strcmp(), strupr(), strlwr(), strrev()), arrays of strings

UNIT-III

Structures, Pointers:
Structures: Defining structures, initializing structures, unions, Array of structures
Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self-referential structures, Enumeration data type.
Preprocessor directives: Commonly used Preprocessor commands like include, define,

Command line arguments

UNIT-IV

Function and Dynamic Memory Allocation:

Functions: Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, call by reference, Passing arrays to functions, passing pointers to functions.

Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions.

Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays of different data types, Storage classes (auto, extern, static and register)

UNIT-V

Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek(), ftell() and rewind() functions.

TEXT BOOKS:

1. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition)
2. Jeri R. Hanly and Elliot B.Koffman, Problem solving and Program Design in C 7th Edition, Pearson

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. E. Balagurusamy, Computer fundamentals and C, 2nd Edition, McGraw-Hill
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB
4. Ashok N. Kamthane, "C and Data Structures", Pearson Education. 2010.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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PROGRAMMING FOR PROBLEM SOLVING LAB

L	T	P	C
0	0	2	1

B.Tech I Year I Semester
Course Code: A221582

Course Outcomes:

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

1. Apply the syntax rules for numerical constants, variables and data types.
2. Design programs on control statements, Arrays and Strings.
3. Develop applications on user defined data types.
4. Develop programs on code reusability using functions.
5. Implement various searching and sorting techniques using arrays.

Week 1

Ubuntu and Linux Commands.

Week 2

Designing of flowcharts and algorithms using raptor tool

1. Areas of Polygons.
2. Calculation of Simple and Compound Interest.
3. Swapping of Two numbers with and without temporary variable.
4. Checking whether a number is even or odd.
5. Sum of first 'n' natural numbers.
6. Checking a number whether it is divisible by any given number.
7. Evaluation of mathematical expressions.
8. Programs using scanf( ) and printf( ) statements

Week 3

1. Program to find the roots of quadratic equation.
2. Program to implement Storage classes.
3. Programs on operators (9 programs).
4. Programs on Command line arguments

Week 4

1. Programs on Conditional Statements (9)
2. Programs on Looping Statements. (9)

Week 5

1. Programs on One Dimensional Arrays. (4 programs), Linear search & Bubble sort
2. Programs on Two Dimensional Arrays. (2 programs)

Week 6

1. Programs on Strings.
2. Programs on Strings with and without using string built-in Functions.

Week 7

1. Programs on Accessing Structures and Nested Structures.
2. Programs on Pointers, pointer arithmetic, pointer expression
3. Programs on Pointer to structure, Call by Reference, Pointer to Pointer.
4. Programs on Unions, typedef and enum

Week 8

1. Programs on Functions. (4 programs)
2. Programs using Recursion.

Week 9

1. Programs on Dynamic Memory Allocation Functions (3 programs).

Week 10

1. Programs on File Input and Output functions (3 programs).
2. Programs on File Operations. (5 programs)

Week 11

Revision

I - II

MATHEMATICS-II (ORDINARY DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS)

B.Tech I Year II Semester
Course Code: A222005

L	T	P	C
3	1	0	4

Course Outcomes:

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

1. Classify the various types of differential equations of first order and first degree and apply the concepts of differential equations to the real-world problems.
2. Solve higher order differential equations and apply the concepts of differential equations to the real-world problems.
3. Find the Laplace Transform of various functions and apply to find the solutions of differential equations.
4. Evaluate the multiple integrals and identify the vector differential operators physically in engineering problems.
5. Evaluate the line, surface and volume integrals and converting them from one to another by using vector integral theorems.

UNIT-I

First order Ordinary Differential Equations and their Applications:

Introduction to ODE, Exact, Linear and Bernoulli, Applications of ODE: Newton's law of cooling, law of natural growth and decay, orthogonal trajectories.

UNIT-II

Higher Order Linear Differential Equations:

Linear differential equations of second and higher order with constant coefficients, RHS term of the type f(X) $= e^{ax}, \sin ax, \cos ax \text{ and } x^k, e^{ax}V(x), x^kV(x)$. Method of variation of parameters, Equations reducible to Linear ODE with constant coefficients: Cauchy-Euler Equation and Legendre's Equations. Applications: Electric Circuits.

UNIT-III

Laplace transforms: Laplace transform of standard functions – Inverse transform – first shifting Theorem, transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms – Application of Laplace transforms to ordinary differential equations.

UNIT-IV

Multiple Integrals & Vector Differentiation:

Multiple integrals - double and triple integrals – change of order of integration (Only Cartesian form)- change of variables (Cartesian to Polar for double integral, Cartesian

to Spherical for triple integral). Gradient- Divergence- Curl and their related properties - Potential function - Laplacian and second order operators.

UNIT-V

Vector Integration: Line integral, work done, Surface and Volume integrals. Vector integrals theorems: Green's, Stoke's and Gauss Divergence Theorems (Only Statements & their Verifications).

TEXT BOOKS:

1. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers, 36th Edition, 2010
2. Advanced Engineering Mathematics by Jain &Iyengar, Narosa Publications.

REFERENCE BOOKS:

1. Calculus and Analytic geometry by G.B. Thomas and R.L. Finney, 9th Edition, Pearson, Reprint, 2002.
2. Advanced Engineering Mathematics by Erwin Kreyszig, 9th Edition, John Wiley & Sons, 2006.
3. Advanced Engineering Mathematics (2nd Edition) by Michael D. Greenberg

APPLIED PHYSICS

L	T	P	C
3	1	0	4

B.Tech I Year II Semester
Course Code: A222007

Course Outcomes:

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

1. Understand various optical phenomena of light
2. Apply the basic principles of quantum mechanics to classify solids based on the band theory
3. Elucidate the characteristics of semiconductors and semiconductor devices
4. Apply the knowledge of nanotechnology for societal applications
5. Explain the working principle of lasers and optical fibers

UNIT-I

Wave Optics: Principle of superposition, coherence. Interference - Interference in thin films by reflection, Newton's rings. Diffraction – Fresnel and Fraunhofer diffraction, Fraunhofer diffraction due to single slit, Plane diffraction grating, Resolving power of grating (qualitative treatment). Polarization – Polarization of light waves, Plane of vibration, Plane of polarization, Double refraction, Nicol's Prism, Applications of polarization.

UNIT-II

Introduction to Quantum Physics and Band theory of solids:

Introduction to quantum physics: Planck's Law (qualitative treatment), wave-particle duality, de-Broglie hypothesis of matter waves, properties of matter waves, time independent Schrodinger equation, Born interpretation of wave function, particle in one dimensional potential box, Fermi-Dirac distribution.

Classical free electron Theory (Qualitative treatment)- merits and demerits, Bloch theorem, Kronig-Penny model (qualitative treatment), E-k diagram, effective mass of electron, Energy bands in solids, classification of materials into metals, semiconductors and insulators.

UNIT-III

Semiconductors and Semiconductor devices:

Intrinsic and extrinsic semiconductors- energy band diagram and position of fermi level (qualitative treatment).

Direct and indirect band-gap semiconductors, Formation of PN junction, energy level diagram of PN junction, I-V characteristics of PN junction diode; construction, working

and characteristics of Photo diode, solar cell and light emitting diode, Hall effect and its applications

UNIT-IV

Nanotechnology: Nanoscale, quantum confinement, surface to volume ratio, bottom-up fabrication: sol-gel, precipitation, combustion methods-top-down fabrication: Ball milling, physical vapor deposition (PVD), chemical vapor deposition (CVD), characterization techniques – basic principles of XRD, SEM, TEM; applications of nanomaterials.

UNIT-V

Lasers and Fiber Optics: Introduction to interaction of radiation with matter: Absorption, spontaneous emission and stimulated emission, Einstein coefficients and their relations, characteristics of a laser, population inversion, important components of a laser: active medium, pumping source, optical resonator. Construction and working of Ruby laser, He-Ne laser and semiconductor laser, applications of lasers.

Introduction to optical fibers, total internal reflection, construction of optical fiber, acceptance angle and numerical aperture, step and graded index fibers, block diagram of optical fiber communication system, applications of optical fibers.

TEXT BOOKS:

1. A Text book of Engineering Physics by P K Palanisamy: Scietech publication.
2. Engineering Physics by V Rajendran, McGraw Hill Education.

REFERENCE BOOKS:

1. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2nd dition, 2022.
2. Essentials of Nanoscience & Nanotechnology by Narsimha Reddy Katta, Typical Creatives NANO DIGEST, 1st Edition, 2021.
3. M. N. Avadhanulu, P.G. Kshirsagar & TVS Arun Murthy" A Text book of Engineering Physics"- S. Chand Publications.

APPLIED PHYSICS LAB

B.Tech I Year II Semester
Course Code: A222085

L	T	P	C
0	0	3	1.5

Course Outcomes:

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

1. Apply optical phenomena to characterize optical sources and components.
2. Characterize semiconductors and semiconductor devices.
3. Study transient response of RC circuit and resonance mechanisms in mechanical and electrical systems.
4. Collect data and evaluate the outcomes of an experiment quantitatively and qualitatively.
5. Carry out experimental data analysis

LIST OF EXPERIMENTS:

1. Newton's rings: Determination of the radius of curvature of a given plano-convex lens by forming Newton's rings.
2. Diffraction grating: Determination of wavelength of a given monochromatic source using a plane diffraction grating.
3. Dispersive power: Determination of dispersive power of given prism.
4. Single Slit Diffraction using Laser- Determination of wavelength of given Laser.
5. Energy gap of P-N junction diode: Determination of the energy gap of a semiconductor diode.
6. Light emitting diode: Study of V-I and P-I characteristics of a given light emitting diode.
7. Photo diode: Study of V-I characteristics of photo diode at different intensities.
8. Solar cell: Study of V-I characteristics of solar cell.
9. LCR Circuit: Determination of the resonance frequency of forced electrical oscillator in series and parallel.
10. RC- Circuit: Determination of the time constant of RC-circuit.
11. Optical fiber:
    a) Determination of the acceptance angle and numerical aperture of optical fiber.
    b) Estimation of attenuation in optical fiber
12. Method of least squares-Torsional pendulum.

    Note: Any 10 experiments are to be performed.

REFERENCE BOOKS:

1. Engineering Physics Theory and Practical, C. K. Pandey, A. K. Katiyar.
2. Engineering Physics Lab Manual, C. V. Madhusudan Rao.

ENGLISH FOR SKILL ENHANCEMENT

B.Tech I Year II Semester
Course Code: A222008

L	T	P	C
2	0	0	2

Course Outcomes:

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

1. Understand the importance of vocabulary and sentence structures.
2. Choose appropriate vocabulary and sentence structures for oral and written communication.
3. Demonstrate understanding of the rules of functional grammar.
4. Develop comprehension skills from known and unknown passages through effective reading strategies.
5. Construct paragraphs, letters, essays, abstracts, précis and reports in various contexts thereby improving proficiency in writing modules of English.

UNIT-I

Chapter entitled '***Toasted English***' **by R.K.Narayan** from ***"English: Language, Context and Culture"*** published by Orient Black Swan, Hyderabad.

Vocabulary: The Concept of Word Formation - The Use of Prefixes and Suffixes - Acquaintance with Prefixes and Suffixes from Foreign Languages to form Derivatives - Synonyms and Antonyms

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.

Reading: Reading and Its Importance - Techniques for Effective Reading.

Writing: Sentence Structures - Use of Phrases and Clauses in Sentences - Importance of Proper Punctuation - Techniques for Writing precisely – Paragraph Writing -Types, Structures and Features of a Paragraph – Creating Coherence - Organizing Principles of Paragraphs in Documents.

UNIT-II

Chapter entitled **'Appro JRD' by Sudha Murthy** from ***"English: Language, Context and Culture" published*** by Orient BlackSwan, Hyderabad.

Vocabulary: Words Often Misspelt - Homophones, Homonyms and Homographs

Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-Verb Agreement.

Reading: Sub-Skills of Reading – Skimming and Scanning – Exercises for Practice

Writing: Nature and Style of Writing - Defining/Describing People, Objects, Places and Events – Classifying - Providing Examples or Evidence.

UNIT-III

Chapter entitled **'Lessons from Online Learning' by F. Haider Alvi, Deborah Hurst et al** from ***"English: Language, Context and Culture"*** published by Orient BlackSwan, Hyderabad.

Vocabulary: Words Often Confused - Words from Foreign Languages and their Use in English.
Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.
Reading: Sub-Skills of Reading – Intensive Reading and Extensive Reading – Exercises for Practice.
Writing: Format of a Formal Letter - Writing Formal Letters E.g.., Letter of Complaint, Letter of Requisition, Email Etiquette, Job Application with CV/Resume.

UNIT-IV

Chapter entitled **'Art and Literature' by Abdul Kalam** from ***"English: Language, Context and Culture"*** published by Orient BlackSwan, Hyderabad.

Vocabulary: Standard Abbreviations in English
Grammar: Redundancies and Clichés in Oral and Written Communication.
Reading: Survey, Question, Read, Recite and Review (SQ3R Method) - Exercises for Practice
Writing: Writing Practices- Essay Writing-Writing Introduction and Conclusion – Précis Writing.

UNIT-V

Chapter entitled **'Go, Kiss the World' by Subroto Bagchi** from ***"English: Language, Context and Culture"*** published by Orient BlackSwan, Hyderabad.

Vocabulary: Technical Vocabulary and their Usage
Grammar: Common Errors in English (*Covering all the other aspects of grammar which were not covered in the previous units*)
Reading: Reading Comprehension-Exercises for Practice
Writing: Technical Reports - Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

TEXT BOOKS:

1. "English: Language, Context and Culture" by Orient BlackSwan Pvt. Ltd, Hyderabad. 2022. Print.

REFERENCE BOOKS:

1. Effective Academic Writing by Liss and Davis (OUP)
2. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
3. Vishwamohan, Aysha. (2013). English for Technical Communication for Engineering Students. Mc Graw-Hill Education India Pvt. Ltd.
4. Swan, Michael. (2016). Practical English Usage. Oxford University Press. Fourth Edition.

ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B.Tech I Year II Semester
Course Code: A222086

L	T	P	C
0	0	2	2

Course Outcomes:

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

1. Reproduce speech sounds and improve language
2. Develop accent and pronunciation in various situations
3. Understand variants in pronunciation by differentiating between British and American accents
4. Identify the diverse purposes of listening and speaking
5. Exhibit critical thinking, problem-solving and decision-making skills through Group Discussions

Exercise-I

CALL Lab:

Understand: Listening Skill- its importance-Purpose-Process-Types-Barriers-Effective Listening.

Practice: Introduction to Phonetics- Speech Sounds- Vowels and Consonants- Minimal Pairs - Consonant Clusters - Past Tense Marker and Plural Marker - Testing Exercises

ICS Lab:

Understand: Spoken vs. Written language - Formal and Informal English.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave –Introducing Oneself and Others.

Exercise-II

CALL Lab:

Understand: Structure of Syllables – Word Stress– Weak Forms and Strong Forms – Stress pattern in sentences – Intonation.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Stress patternin sentences – Intonation - Testing Exercises

ICS Lab:

Understand: Features of Good Conversation – Strategies for Effective Communication.

Practice: Situational Dialogues – Role Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise-III

CALL Lab:

Understand: Errors in Pronunciation-Neutralizing Mother Tongue Interference (MTI).

Practice: Common Indian Variants in Pronunciation – Differences between British and AmericanPronunciation - Testing Exercises

ICS Lab:
Understand: Descriptions – Narrations - Giving Directions and Guidelines – Blog Writing
Practice: Giving Instructions – Seeking Clarifications – Asking for and Giving Directions – Thankingand Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise-IV
CALL Lab:
Understand: Listening for General Details.
Practice: Listening Comprehension Tests - Testing Exercises
ICS Lab:
Understand: Public Speaking – Exposure to Structured Talks - Non-verbal Communication - Presentation Skills.
Practice: Making a Short Speech – Extempore - Making a Presentation.

Exercise-V
CALL Lab:
Understand: Listening for Specific Details.
Practice: Listening Comprehension Tests -Testing Exercises
ICS Lab:
Understand: Group Discussion
Practice: Group Discussion

REFERENCE BOOKS:

1. (2022). English Language Communication Skills – Lab Manual cum Workbook. Cengage Learning India Pvt. Ltd.
2. Shobha, KN & Rayen, J. Lourdes. (2019). Communicative English – A workbook. CambridgeUniversity Press
3. Board of Editors. (2016). ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities.Orient Black Swan Pvt. Ltd.

ELECTRONIC DEVICES AND CIRCUITS

B.Tech I Year II Semester
Course Code: A222402

L	T	P	C
2	0	0	2

Course Outcomes:

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

1. Acquire the knowledge of various electronic devices and their use on real life.
2. Know the applications of various devices.
3. Acquire the knowledge about the Bipolar Junction Transistor.
4. Acquire the knowledge about the Field Effect Transistor.
5. Acquire the knowledge about the role of special purpose devices and their applications.

UNIT-I

Diodes: Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics, Diode as a switch- switching times.

UNIT-II

Diode Applications: Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters, Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.

UNIT-III

Bipolar Junction Transistor (BJT): Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times,

UNIT-IV

Field Effect Transistor (FET): JFET- Construction, Principle of Operation, Pinch-Off Voltage, Volt- Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSFET as a capacitor.

UNIT-V

Special Purpose Devices: Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.

TEXT BOOKS:

1. Jacob Millman - Electronic Devices and Circuits, McGraw Hill Education
2. Robert L. Boylestead, Louis Nashelsky- Electronic Devices and Circuits theory, 11th Edition, 2009, Pearson.

REFERENCE BOOKS:

1. Horowitz -Electronic Devices and Circuits, David A. Bell – 5th Edition, Oxford.
2. Chinmoy Saha, Arindam Halder, Debaati Ganguly - Basic Electronics-Principles and Applications, Cambridge, 2018.

PYTHON PROGRAMMING LAB

L	T	P	C
0	2	2	3

B.Tech I Year II Semester
Course Code: A222583

Course Outcomes:

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

1. Develop the application specific codes using python.
2. Understand Strings, Lists, Tuples and Dictionaries in Python
3. Implement programs using modular approach, file I/O, Python standard library

Week -1 (Installation & Simple Applications)

1. i) Use a web browser to go to the Python website http://python.org. This page contains information about Python and links to Python-related pages, and it gives you the ability to search the Python documentation.
   ii) Start the Python interpreter and type help() to start the online help utility.
2. Start a Python interpreter and use it as a Calculator.

Week-2: (Mathematical Expressions & I/O Operations)

1. i) Write a program to calculate compound interest when principal, rate and number of periods are given.
   ii) Given coordinates (x1, y1), (x2, y2), find the distance between these two points.
2. Read name, address, email and phone number of a person through keyboard and print the details.

Week-3: (Conditional Statements)

1. Write a Program to find the given number is even or odd.
2. Write a program to find the maximum of three numbers (use 'if-elif-else' ladder).

Week-4: (Loop Statements)

1. Write a program to Print the Fibonacci sequence using while loop.
2. Write a program to Print the below triangle using for loop:

   5
   4 4
   3 3 3
   2 2 2 2
   1 1 1 1 1
3. Write a program to print all prime numbers in a given interval (using break statement).

Week-5: (List, Tuple, Dictionary)

1. i) Write a program to illustrate operations of List & Tuple
   ii) Write a program to find common values between two lists.
2. Write a program to perform addition of two matrices.
3. Write a program to read dictionary values from the user and find an element using given key.

Week-6: (Functions & Modules)

1. Write a function called is_sorted that takes a list as a parameter and return True if the list is sortedin ascending order and False otherwise.
2. Write a function called GCD that takes parameters **a** and **b** and return their greatest common divisor.
3. How do you make a module? Give an example of construction of a module using different geometrical shapes and operations on them as its functions.

Week-7: (Strings)

1. Write a program to add a comma between the characters. If the given word is 'Apple', it should become 'A,p,p,l,e'
2. Write a program to remove the given word in all the places in a string?
3. Write a function that takes a sentence as an input parameter and replaces the first letter of everyword with the corresponding upper case letter and the rest of the letters in the word by corresponding letters in lower case without using a built-in function?

Week-8: (Classes & Objects)

1. Write a program to add two complex numbers using classes and objects
2. Write a function called draw_rectangle that takes a Canvas and a Rectangle as arguments and draw a representation of the Rectangle on the Canvas.

Week-9: (Inheritance)

1. Write a program to demonstrate the various types of Inheritances.

Week-10: (File Concepts)

1. Write a program to merge two given file contents into a third file.
2. Write a program to Read text from a text file, find the word with most number of occurrences
3. Write a program that reads a file *file1* and displays the number of words, number of vowels, and blank spaces.

Week-11: (Packages)

1. a) Install NumPy package with pip and explore it.
   b) Illustrate 1-D and 2-D vector processing and slicing.
2. Explore matplotlib with plotpy and visualize the data.

TEXT BOOKS:

1. "Python Programming- Using Problem Solving Approach", Reema Thareja, Oxford
2. "Python Programming-Problem Solving, Packages and Libraries", Anurag Gupta, G.P. Biswas, Mc Graw Hill

ENGINEERING WORKSHOP

L	T	P	C
0	1	3	2.5

B.Tech I Year II Semester
Course Code: A222382

Course Outcomes:

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

1. Understanding the tools and methods of using to fabricate engineering Components.
2. Applying the measuring techniques to verify the dimensional accuracy.
3. Evaluating various methods and trades of workshop in the component building.

TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry – T-Lap Joint, Dovetail Joint & Tenon Joint.
2. Fitting – V-Fit, Step Cutting & Flat Filling.
3. Tin-Smithy – Open Scoop, Rectangular Tray & Conical Funnel.
4. Foundry – Preparation of Green Sand Mould using Single Piece and Split Pattern.
5. Welding Practice – Arc Welding – Lap Joint & Butt Joint.
6. House-wiring – Parallel Connection, Series Connection & Two-way Switch.

TRADES FOR DEMONSTRATION & EXPOSURE

Plumbing, Machine Shop, Power tools in construction and Wood Working

TEXT BOOKS:

1. Manufacturing Engineering and Technology, Kalpakjian S. and Steven S. Schmid, 4th edition, Pearson Education India Edition, 2002.
2. Elements of Workshop Technology, Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.

REFERENCE BOOKS:

1. Work shop Manual - P. Kannaiah/ K.L. Narayana/ Scitech
2. Workshop Manual / Venkat Reddy/ BSP

II - I

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

L	T	P	C
3	0	0	3

B.Tech II Year I Semester
Course Code: A223510

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

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

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

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

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

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

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

TEXT BOOKS:

1. Discrete Mathematics forComputer 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 Applications‖, Kenneth H Rosen, Tata McGraw Hill Publishing Company Limited, New Delhi, Sixth Edition,2007.

DATA STRUCTURES

L	T	P	C
3	0	0	3

B.Tech II Year I Semester
Course Code: A223504

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

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

UNIT-I

Data Structures: Introduction, Types of data structures, Static and Dynamic representation of data structure and comparison.

Stacks: Stacks definition, operations on stacks, Representation and evaluation of expressions using Infix, Prefix and Postfix, Algorithms for conversions and evaluations of expressions from infix to prefix and postfix using stack.

Queues: types of Queues- Circular Queue, Deque and operations.

UNIT-II

Trees: Basic terminologies, Types of Binary Tree: Complete and Full Binary Tree, Extended Binary Trees, Representation of Trees using Arrays and Linked lists (advantages and disadvantages), Tree Traversal, Representation of Algebraic expressions, Threaded Binary Trees.

UNIT-III

Advanced concepts on trees: Representation and Creation of Binary Search Trees (BST), Operations on BST, Representation and advantages of AVL Trees, algorithms & operations on AVL Trees, Multi-way trees, Definition and advantages of B-trees, B+ Trees, Red-Black Trees.

UNIT-IV

Graphs-Basic terminology, Representation of graphs: sequential representation, Adjacency, Path Matrix) Linked representation. Graph Traversals-Breadth First Search, Depth First Search algorithms. Spanning Tree, Minimum Spanning Trees- Prim's Algorithm, Kruskals Algorithm, Dijkstra Algorithm.

UNIT-V

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

TEXT BOOKS:

1. Data Structures Using C, Second Edition Reema Thereja OXFORD higher Education
2. Fundamentals of Data Structures, 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++, Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein PHI Learning Private Limited, Delhilndia.
3. Data Structures, A Pseudo code Approach with C, Richard F.Gillberg & Behrouz A. Forouzan, Cengage Learning, India Edition, Second Edition,2005.

PROBABILITY & STATISTICS

B.Tech II Year I Semester
Course Code: A223009

L	T	P	C
3	1	0	4

Course Outcomes:

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

1. To differentiate among random variables involved in the probability models which are useful for all branches of engineering.
2. Derive relationship among variety of performance measures using probability distributions.
3. Acquire elementary knowledge of parametric and non parametric –tests and understand the use of observing state analysis for predicting future conditions.
4. Identify and examine situations that generate using problems and able to solve the tests of ANOVA for classified data.
5. Apply proper measurements, Indicators and techniques of Correlation and regression analysis.

UNIT-I

PROBABILITY AND RANDOM VARIABLES:

PROBABILITY: Introduction- Sample space and events- probability. The axioms of probability- some elementary theorems-conditional probability- Bayee's Theorem.

RANDOM VARIABLES: Random variable, Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution.

UNIT-II

PROBABILITY DISTRIBUTIONS: Fitting of Binomial, Poisson & Normal distributions and their properties (only Statements) Moment Generating Functions of the above three distributions and hence finding the mean and variance.

UNIT-III

SAMPLING THEORY & TESTING OF HYPOTHESIS I:

Sampling Distribution: Definition of Sample, Population, and Types of Sampling. Estimation - Point estimation, Interval estimation.

Testing of Hypothesis: Null hypothesis – Alternative hypothesis, Type I, & Type II errors – critical region confidence interval for mean, Testing of hypothesis for single mean and difference between the means for large samples. Confidence interval for the proportions, Tests of hypothesis for the proportions- single and difference between the proportions for large samples

UNIT-IV

TESTING OF HYPOTHESIS II: Small Samples - t-distribution, F-Distribution, χ^2 distribution, ANOVA for one-way classified data

UNIT-V

CORRELATION, REGRESSION & CURVE FITTING:

Correlation and Regression: Coefficient of Correlation-Regression coefficients- The lines of Regression- The Coefficient of Rank Correlation.

Curve Fitting: Fitting a Straight line – Second Degree Polynomials – Exponential and Power Curve by the Method of Least Squares.

TEXT BOOKS:

1. Probability and Statistics for Engineers, by Richard Arnold Johnson, Irvin Miller and John E Freund, New Delhi Prentice Hall.
2. Probability and Statistics, by T. K. V. Iyangar others, S. Chand Publications
3. Introduction to Probability & Statistics for Engineers and Scientists by Sheldon M.Ross

REFERENCE BOOKS:

1. Fundamentals of Mathematical Statistics, by S C Guptha and V K Kapoor, S Chand.
2. Mathematics for Engineers and Scientists, by Alan Jeffrey, sixth edition, CRC press.

COMPUTER SYSTEM ARCHITECTURE

B.Tech II Year I Semester
Course Code: A223505

L	T	P	C
3	0	0	3

Course Outcomes:

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

1. Understand the various number System
2. Classify the basics of instruction sets
3. Demonstrate the design of functional units of a digital computer system.
4. Analyze various computer arithmetic operations.
5. Design a pipeline for consistent execution of instruction with minimum hazards

UNIT-I

Number Systems: Binary, Octal, Hex Decimal, and Conversions, range; Binary additions and subtractions (using 1c, and 2c), concept of overflow, representations of negative numbers using 1's and 2's complement and range; BCD numbers: Representation of 8421, 2421, Ex-3, Gray and self-complementary codes; additions and subtractions on 8421 codes.

UNIT-II

Structure of Computers: Computer types, functional units, basic operational concepts, Von Neumann architecture, bus structures, software, performance, multiprocessors and multicomputer, data representation, fixed and floating point and error detecting codes Register Transfer and Micro Operations: Register transfer language, register transfer, bus and memory transfers, arithmetic micro-operations, shift microoperations, arithmetic logic shift unit

UNIT-III

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, instruction cycle, timing and control, memory reference instructions, input, output and interrupt.

Central Processing Unit: stack organization, instruction formats, addressing modes,data transfer and manipulation, program control, reduced instruction set computer (RISC).

UNIT-IV

Computer Arithmetic: Addition and subtraction, multiplication and division algorithms, floating point arithmetic operation, decimal arithmetic unit, and decimal arithmetic operations.

UNIT-V

The Memory System: Basic concepts, semiconductor RAM types of read only memory (ROM), cache memory, performance considerations, virtual memory, secondary storage raid, direct memory access (DMA).

Processor and control unit Basic MIPS implementation Building data path Control Implementation scheme Pipelining Pipelined data path and control Handling Data hazards & Control hazards Exceptions.

TEXTBOOKS:

1. Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Computer Organization – Car Hamacher, ZvonksVranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DATABASE MANGEMENT SYSTEMS

L	T	P	C
3	0	0	3

B.Tech II Year I Semester
Course Code: A223506

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

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

UNIT-I

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

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

UNIT-II

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

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

UNIT-III

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

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

UNIT-IV

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

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

UNIT-V

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

TEXTBOOKS:

1. Abraham Silberschatz, Henry F. Korth, S.Sudarshan, Database System Concepts 6thEdition, Tata McGraw-Hill.
2. Raghu RamaKirshna, Johannes Gehrk, Database Management System, Tata McGraw Hill 3rd Edition.

REFERENCE BOOKS:

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DATA STRUCTURES LAB

L	T	P	C
0	0	2	1

B.Tech II Year I Semester
Course Code: A223584

Course Outcomes:

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

1. Develop the programs on stacks, trees and its applications.
2. Design and implementation of programs on Linked lists and Tree Traversals.
3. Apply Tree Concepts on advanced Trees.
4. Implement Graph and its Traversing Techniques.
5. Apply Hashing techniques in real world applications.

LIST OF EXPERIMENTS

1. C Programs to illustrate concepts of arrays, structures, unions and enumerated data types.
2. Write a Program to implement stack, queue using linked list
3. Program to convert infix to postfix notation
4. Program to evaluate postfix notations
5. Write a program to implement doubly linked list and its operations
6. Program to illustrate tree traversals
   a. In order
   b. Pre order
   c. Post order
7. Program to illustrate insertion, deletion and searching in Binary Search Tree.
8. Program to illustrate Insertion, deletion and Rotation on AVL Trees.
9. Program to illustrate Graph traversals
   a. Breadth First Search
   b. Depth First Search
10. Program to implement hash table using linear and quadratic probing.
11. Implement Dictionaries using hashing.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DATABASE MANAGEMENT SYSTEMS LAB

L	T	P	C
0	0	2	1

B.Tech II Year I Semester
Course Code: A223585

Course Outcomes:
At the end of the course, student will 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.

EXPERIMENTS:

1. Database Schema for a customer-sale scenario
   Customer (Custid : integer, cust_name: string)
   Item (item_id: integer,item_name: string, price:integer)
   Sale (bill_no: integer, bill_data: date, cust_id: integer, item_id: integer, qty sold: integer)
   For the above schema, perform the following:
   a. Create the tables with the appropriate integrity constraints.
   b. Insert around 10 records in each of the tables
   c. List all the bills for the current date with the customer names and item numbers
   d. List the total Bill details with the quantity sold, price of the item and the final amount
   e. List the details of the customer who have bought a product which has a price>200.
   f. Give a count of how many products have been bought by each customer
   g. Give a list of products bought by a customer having cust_id as 5.
   h. List the item details which are sold as of today
   i. Create a view which lists out the bill_no, bill_date, cust_id, item_id, price, qty_sold, amount.
   j. Create a view which lists the daily sales date wise for the last one week
2. Database Schema for a Student Library scenario
   Student (Stud_no :integer, Stud_name: string)
   Membership (Mem_no: integer, Stud_no: integer)
   Book (book_no: integer, book_name:string, author: string)

Iss_rec(iss_no:integer, iss_date: date, Mem_no: integer, book_no: integer)

For the above schema, perform the following:

a. Create the tables with the appropriate integrity constraints.
b. Insert around 10 records in each of the tables.
c. List all the student names with their membership numbers
d. List all the issues for the current date with student and Book names
e. List the details of students who borrowed book whose author is KORTH.
f. Give a count of how many books have been bought by each student.
g. Give a list of books taken by student with stud_no as5.
h. List the book details which are issued as of today.
i. Create a view which lists out the iss_no, iss _date, stud_name, book name
j. Create a view which lists the daily issues-date wise for the last one week

3. Database Schema for a Employee-payscenario

Employee(emp_id:integer, emp_name:string)
Department(dept_id:integer, dept_name:string)
Paydetails(emp_id :integer, dept_id: integer, basic: integer, deductions: integer, additions: integer, DOJ: date)
Payroll (emp_id : integer, pay_date: date)
For the above schema, perform the following:

a. Create the tables with the appropriate integrity constraints.
b. Insert around 10 records in each of the tables.
c. List the employee details department wise.
d. List all the employee names who joined after particular date.
e. List the details of employees whose basic salary is between 50,000 and 1,00,000.
f. Give a count of how many employees are working in each department.
g. Give a name of the employees whose netsalary>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 netsalary.

4. Database Schema for a Video Library scenario

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

a. Create the tables with the appropriate integrity constraints

b. Insert around 10 records in each of the tables.

c. List all the customer names with their membership numbers
d. List all the issues for the current date with the customer names and cassette names
e. List the details of the customer who has borrowed the cassette whose title is —The Legend
f. Give a count of how many cassettes have been borrowed by each customer.
g. Give a list of cassettes which has been taken by the Customer with mem_no as5
h. List the cassettes issues for today.
i. Create a view which lists outs the iss_no, iss_date, cust_name, cass_name
j. Create a view which lists issues-date wise for the last one week

5. Database Schema for a student-Lab scenario
   Student (stud_no: integer, stud_name: string, class: string)
   Class (class: string,descrip:string)
   Lab (mach_no: integer, Lab no: integer, description: String)
   Allotment (Stud_no: Integer, mach_no: integer, day of week: string)
   For the above schema, perform the following:
   a. Create the tables with the appropriate integrity constraints.
   b. Insert around 10 records in each of the tables.
   c. List all the machine allotments with the student names, lab and machine numbers
   d. List the total number of lab allotments day wise.
   e. Give a count of how many machines have been allocated to the 'CSE' class
   f. Give machine allotment details of the stud_no 5 with his personal and class details.
   g. Count for how many machines have been allocated in Lab_no 1 for the day of the week as –Monday
   h. How many students class wise have allocated machines in the labs.
   i. Create a view which lists out the stud_no, stud_name, mach_no, lab_no, dayofweek.
   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. Creat re/after insert on employee table for each row/statement.e 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 department.
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 befo

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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SKILL DEVELOPMENT COURSE
(DATA VISUALIZATION THROUGH R-PROGRAMMING)

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0	0	2	1

B.Tech II Year I Semester
Course Code: A223588

Course Outcomes:

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

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

EXPERIMENTS

WEEK 1

1. Write a R Program to create and name a Vector
2. Write a R program implement vector subsetting

WEEK 2

1. Write a R Program to create and name a Matrix
2. Write a R program implement Matrix Subsetting

WEEK 3

1. Write a R program to Access list elements and Manipulate list elements
2. Write a R program which converts list into a Vector

WEEK 4

1. Write a R program to Control flow statements:
    a. If condition
    b. If-else condition
2. Write a R program to implement Iterative statements:
    a. For loop
    b. While loop
3. Write a R program to demonstrate usage of
    a. Repeat
    b. Break
    c. Return
    d. Next

WEEK 5

1. Write a R program to find reverse of a given number using functions
2. Write a R program to find factorial of a given number using recursion

WEEK 6

Write a R program to demonstrate R Packages

WEEK 7

Write a R program to calculate mean, media

WEEK 8

Write a R program to implement

a. Factor levels
b. Summarizing Factors
c. Comparing Ordered factors

WEEK 9

Write a R program to implement

a. Subsetting of Data Frames
b. Extending Data Frames
c. Sorting Data Frames

WEEK 10

Write a R program to demonstrate

a. Lapply()
b. Sapply()
c. Split()

TEXTBOOKS:

1. K.G. Srinivas, G.M. Siddesh "Statistical Programming in R", OXFORD Publications.
2. R Programming for Data Science by Roger D. Peng (References)
3. The Art of R Programming by Norman Matloff Cengage Learning India.

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QUANTITATIVE METHODS & LOGICAL REASONING

L	T	P	C
2	0	0	1

B.Tech II Year I Semester
Course Code: A223013

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

1. To perform well in various competitive exams and placement drives.
2. To solve basic and complex mathematical problems in short time.
3. To become strong in Quantitative Aptitude and Reasoning which can be applied for GRE, GATE, GMAT or CAT exam also?
4. To develop problem solving skills and analytical abilities, which play a great role in corporate and industry set up

UNIT-I

Number System: Speed Maths, Numbers, Factors, Prime & Co Primes, LCM & HCF, Divisibility Rules, Finding Unit Place Digit and Last Two Digits of an Expression

Ratio, Proportion and Variations: Definition of Ratio, Ratio of Proportion, Comparison of Ratios, Compound ratio, Direct and Indirect Proportion

Percentages: Converting Fractions and Decimal into Percentages, Successive Percentage, Populations, Expenditure and Savings

Profit and loss: Relation between Cost Price and Selling Price, Discount and Marked Price, Gain or Loss Percentages on Selling Price

Simple and Compound Interest: Problems on Interest (**I**), Amount (**A**), Principal (**P**) and Rate of Interest (**R**) difference between the Simple Interest and Compound Interest for 2 and 3 years.

UNIT-II

Partnership: Relation between Partners, Period of Investment and Shares

Averages, Ages and Allegation : Average of Different Groups, Change in Averages by Adding, Deleting and Replacement of Objects, Problems on ages, Allegation Rule, Mean Value of the Mixture, Replacement of Equal Amount of Quantity.

Time and Work: Men and Days, Work and Wages, Pipes and Cisterns, Hours and Work, Alternate Days Concept,

Time and Distance: Difference between the Average and Relative Speeds, Reaching the Destination Late and Early, Stoppage Time Per Hour, Time and Distance between Two Moving Bodies : Train Crossing Man - same and opposite directions, Speed of Boat and Stream,

UNIT-III

Progressions and Quadratic Equations: Arithmetic, Geometric and Harmonic Progressions, Arithmetic Mean, Geometric Mean and Harmonic Mean and their Relations. General form of Quadratic Equation, Finding the Roots of Quadratic Equation, Nature of the Roots.

Permutation and Combination: Fundamental Rules, Problems on Permutations & combinations.

Probability: Definition of probability, Notations and Formulae, Problems on Probability.

Data Interpretation and Data Sufficiency: Tabular and Pie-charts, Bar and Line Graphs, Introduction to Data Sufficiency, Problems on Data Sufficiency.

UNIT-IV

Deductions: Statements and conclusions using Venn diagram and Syllogism Method

Series completion: Number series, Alphabet series, Letter Series.

Coding and Decoding: Letter coding, Number coding, Number to letter coding, Matrix Coding, Substitution, Mixed Letter Coding, Mixed Number Coding, Deciphering Individual Letter Codes by Analysis.

Analytical Reasoning Puzzles: Problems on Linear, Double line-up and Circular Arrangements, Selections and Comparisons.

Blood Relations: Defining the various Relations among the Members of a Family, Solving Blood Relation Puzzles by using Symbols and Notations. Problems on Coded Relations.

UNIT-V

Direction sense Test: Sort of directions in puzzles distance between two points, problems on shadows, Application of triangular triplets.

Clocks: Relation between Minute-Hour Hands, Angle vs Time, Exceptional Cases in Clocks

Calendars: Definition of a Leap Year, Finding the Odd days, Finding the Day of any Random Calendar Date, repetition of Calendar Years.

Cubes and Dices: Finding the Minimum and Maximum Number of Identical Pieces and Cuts, Painting of Cubes and cuts, Problems on Dice.

Venn Diagrams: Circular Representation of given words, Geometrical Representation of Certain class, Set theory based Problems.

TEXTBOOKS:

1. Verbal Reasoning, GL Barrons, Pinterest, Latest Edition 2019
2. A Modern Approach to Logical Reasoning & Quantitative Aptitude, R S Agarwal, S.Chand, Publications, Revised edition, 2019

REFERENCE BOOKS:

1. Quantitative Aptitude, G.L Barrons, Pinrest 2019
2. Quantitative Aptitude, Abhijit Guha, Mc Graw Hills, Edition 2019
3. Quantitative Aptitude, U. Mohan Rao SCITECH

II - II

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech II Year II Semester
Course Code: A224511

L	T	P	C
3	0	0	3

Course Outcomes:

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

1. Analyze the efficiency of algorithms
2. Develop algorithms divide & conquer, greedy and related problems
3. Examine the performance of Dynamic programming
4. Explain performance of algorithm using Backtracking
5. Analyze NP-Hard and NP-Complete problems

UNIT-I

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

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

UNIT-II

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

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

UNIT-III

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

UNIT-IV

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

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

UNIT-V

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

OPERATING SYSTEMS

L	T	P	C
3	0	0	3

B.Tech II Year II Semester
Course Code: A224512

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

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

UNIT - I

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

UNIT - II

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

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

UNIT - III

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

UNIT - IV

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation File System

Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.

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

UNIT - V

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

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

TEXT BOOKS:

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

REFERENCES BOOKS:

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

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OBJECT ORIENTED PROGRAMMING THROUGH JAVA

L	T	P	C
3	0	0	3

B.Tech II Year II Semester
Course Code: A224513

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

1. Understand OOP concepts to apply basic Java constructs.
2. Analyze different forms of inheritance and usage of Exception Handling
3. Understand the different kinds of file I/O 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 me /O. Multi-threading: Differences between multi-threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

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

UNIT-IV

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

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

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

UNIT-V

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

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

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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SOFTWARE ENGINEERING

L	T	P	C
3	0	0	3

B.Tech II Year II Semester
Course Code: A224514

Course Outcomes:

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

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

UNIT-I

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

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

UNIT-II

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

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

Requirements Engineering Process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT-III

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

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

User interface design: Golden rules.

UNIT-IV

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

Product Metrics: Software Quality, Metrics for requirements Model- function based metrics, Metrics for Design Model-object oriented metrics, class oriented metrics,

component design metrics, Metrics for source code, Metrics for Testing, Metrics for maintenance.

UNIT-V

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

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
AN AUTONOMOUS INSTITUTION

INTRODUCTION TO ARTIFICIAL ENGINEERING

L	T	P	C
2	0	0	2

B.Tech II Year II Semester
Course Code: A224515

Course Outcomes:

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

1. Understand the basic concepts and environment of Artificial intelligence.
2. Analyze various uniformed and informed search algorithm related to artificial intelligence.
3. Design various simple and complex network with real time applications.
4. Analyze the basic principles Markov Decision with real time applications.
5. Illustrate various types of Reinforcement Learning.

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

Probabilistic Reasoning: Probability, Conditional Probability, Bayes Rule, Bayesian Networks- Representation, Construction and Inference, Temporal Model, Hidden Markov Model, Dynamic Bayesian Networks (DBN), Natural Language Processing using HMM.

UNIT-IV

Markov Decision Process, MDP Formulation, Utility Theory, Utility Functions, 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.

TEXTBOOKS:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 3rd Edition, Prentice Hall
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill

REFERENCE BOOKS:

1. Trivedi, M.C., "A Classical Approach to Artificial Intelligence", Khanna Publishing House, Delhi.
2. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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OPERATING SYSTEMS LAB

B.Tech II Year II Semester
Course Code: A224591

L	T	P	C
0	0	2	1

Course Outcomes:

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

1. Implement various CPU scheduling algorithms
2. Apply the memory management techniques
3. Implement Page replacement Techniques
4. Analyze File allocation strategies
5. Implement Deadlock avoidance

Programs:

1. Simulate the following CPU Scheduling Algorithms using C program:
   a. FCFS b. SJF
2. Simulate the following CPU Scheduling Algorithms using C program:
   a. Priority b. Round Robin
3. Write a C program tom implement the producer-consumer problem using semaphores.
4. Write a C program for implementing memory allocation method for fixed partition using First fit.
5. Write a C program for implementing memory allocation method for fixed partition using Best fit
6. Write a C program for implementing memory allocation method for fixed partition using Worst fit
7. Simulate Paging Technique of Memory Management using C program.
8. Write a program to implement FCFS page replacement algorithm
9. Write a program to implement Optimal page replacement algorithm
10. Write a program to implement LRU page replacement algorithm
11. Write a C program to simulate the following file allocation strategies.
    a. Sequential
    b. Indexed
    c. Linked
12. Write a program to implement Banker's algorithm for deadlock avoidance

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

L	T	P	C
0	0	2	1

B.Tech II Year II Semester
Course Code: A224592

Course Outcomes:

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

1. Apply basic Java constructs and OOP to solve mathematical problems.
2. Apply Inheritance in Java programs and Analyze Exception Handling code
3. Implement File input/output and multithreading concepts in advanced Java programs.
4. Design different GUI applications using GUI layouts.
5. Apply Applet development and Database connectivity to build GUI applications

Week 1 & 2:

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

Week 3:

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

Week 4 & 5:

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

Week 6 & 7:

1. Write a program to illustrate Multithreading and Multitasking.
2. Write a program to illustrate thread priorities.
3. Write a program to illustrate Synchronization

Week 8 & 9:

1. Write a program to implement String Tokenizer.
2. Write a program to read one line at a time, and write it to another file.

Week 10 & 11:

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

Week 12:

Write a program to develop a calculator application using AWT.

Week 13:

Write a program to illustrate JDBC.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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SKILL DEVELOPMENT COURSE ON NODE JS

L	T	P	C
0	0	2	1

B.Tech II Year II Semester
Course Code: A224597

Course Outcomes:

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

1. Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.
2. Demonstrate Advanced features of JavaScript and learn about JDBC
3. Develop Server – side implementation using Java technologies like servlet
4. Develop the server – side implementation using Node JS.
5. Design a Single Page Application using React.

EXCERCISES:

1. Build a responsive web application for shopping cart with registration, login, catalog and cart pages using CSS3 features, flex and grid.
2. Make the above web application responsive web application using Bootstrap framework.
3. Use JavaScript for doing client – side validation of the pages for the above 2 web applications.
4. Develop a java stand alone application that connects with the database (Oracle / mySql) and perform the CRUD operation on the database tables.
5. Create an xml for the bookstore. Validate the same using both DTD and XSD.
6. Design a controller with servlet that provides the interaction with web application
7. Maintaining the transactional history of any user is very important. Explore the various session tracking mechanism using Cookies
8. Maintaining the transactional history of any user is very important. Explore the various session tracking mechanism using Sessions.
9. Develop an express web application that can interact with REST API to perform CRUD operations on student data
10. Create a react application for the student management system having registration, login, contact, about pages and implement routing to navigate through these pages.
11. Create a custom server using http module and explore the other modules of Node JS like OS, path, event.

TEXTBOOKS:

1. Jon Duckett, Beginning HTML, XHTML, CSS, and JavaScript, Wrox Publications, 2010.
2. Bryan Basham, Kathy Sierra and Bert Bates, Head First Servlets and JSP, O'Reilly Media, 2nd Edition, 2008.
3. Vasan Subramanian, Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node, 2nd Edition, A Press.

PROFESSIONAL COMMUNICATION

L	T	P	C
2	0	0	1

B.Tech II Year II Semester
Course Code: A224014

Course Outcomes:

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

1. Acquire enhanced personality
2. Demonstrate appropriate professional etiquette
3. Practice team building with strong communication skills
4. Develop problem solving skills and decision-making
5. Exhibit effective communication on digital platforms

UNIT-I

Introduction to Soft Skills: Soft Skills for personal and professional development, Self Introduction in various situations, SWOC Analysis, Goal setting

UNIT-II

Professional Etiquette: Etiquette-Mobile Etiquette- Netiquette, Non-Verbal Communication, Presentations – Individual & Team, Time Management

UNIT-III

Team Essentials: Leadership Skills, Team Building, Negotiation Skills, Group Discussion-Functional Aspects

UNIT-IV

Decision Making & Problem Solving: Logical Thinking, Decision Making, Problem Solving, Critical Thinking

UNIT-V

Digital Communication: Role of Multimedia in Communication, E-Mail, Social Networking: Importance and Effects. ommunication in Corporate World

REFERENCE BOOKS:

1. Ashrif Rizvi, Effective Technical Communication, Tata Mac Graw Hill, 2018.
2. Barun, K Mitra, Personality Development and Soft Skills, Oxford University Press, 2nd Edition, 2017.

III - I

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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FORMAL LANGUAGES AND AUTOMATA THEORY

L	T	P	C
3	1	0	4

B.Tech III Year I Semester
Course Code: A225524

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. Analyze the role of the Turing machine as computational and universal machine.

UNIT -I

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

UNIT -II

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

UNIT –III

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

UNIT -IV

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

UNIT -V

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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COMPUTER NETWORKS

L	T	P	C
3	1	0	4

B.Tech III Year I Semester
Course Code: A225525

Course Outcomes:

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

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

UNIT-I

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

Physical Layer: Guided transmission media, wireless transmission media.

UNIT-II

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

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

UNIT-III

Network Layer: Network Layer Design issues, routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, **Count to Infinity Problem**, Hierarchical Routing, Congestion control algorithms, admission control

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

UNIT-IV

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

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

UNIT-V

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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WEB TECHNOLOGIES

B.Tech III Year I Semester
Course Code: A225526

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT-I

Introduction to HTML: HTML tags, Lists, Tables, Images, Forms, Frames, Cascading Style Sheets

Client Side Scripting: Java Script Language Declaring variables, Scope of variables, Functions, Objects in java scripts, Dynamic HTML with java scripts, Form Validation.

UNIT-II

XML: Introduction to XML, Defining XML tags their attributes and values, Document Type Definition, XML Schema, Document Object Model, and XHTML.

Parsing XML Data: DOM and SAX Parsers in java.

UNIT-III

Introduction to PHP:

Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc. Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files listing directories.

UNIT-IV

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

Introduction to JDBC: JDBC Drivers, JDBC Process, Connecting to a Database using JDBC

UNIT-V

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

TEXT BOOKS

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

REFERENCE BOOKS

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

DEVOPS
(PROFESSIONAL ELECTIVE – I)

L	T	P	C
3	0	0	3

B.Tech. III Year I Sem.
Course Code: A225527

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

1. Understand the various components of DevOps environment.
2. Identify Software development models and architectures of DevOps
3. Use different project management and integration tools.
4. Select an appropriate testing tool and deployment model for project.

UNIT-I

Introduction to DevOps: Introduction, Agile development model, DevOps and ITIL. DevOps process and Continuous Delivery, Release management, Scrum, Kanban, delivery pipeline, identifying bottlenecks.

UNIT-II

Software development models and DevOps: DevOps Lifecycle for Business Agility, DevOps, and Continuous Testing.

DevOps influence on Architecture: Introducing software architecture, The monolithic scenario, Architecture rules of thumb, The separation of concerns, Handling database migrations, Micro services and the data tier, DevOps, architecture, and resilience.

UNIT-III

Introduction to project management: The need for source code control, the history of source code management, Roles and code, source code management system and migrations, shared authentication, Hosted Git servers, Different Git server implementations, Docker intermission, Gerrit, The pull request model, GitLab.

UNIT-IV

Integrating the system: Build systems, Jenkins build server, Managing build dependencies, Jenkins plugins, and file system layout, The host server, Build slaves, Software on the host, Triggers, Job chaining and build pipelines, Build servers and infrastructure as code, Building by dependency order, Build phases, Alternative build servers, Collating quality measures.

UNIT-V

Testing Tools and Deployment: Various types of testing, Automation of testing Pros and cons, Selenium - Introduction, Selenium features, JavaScript testing, Testing backend

integration points, Test-driven development, REPL-driven development. Deployment of the system: Deployment systems, Virtualization stacks, code execution at the client, Puppet master and agents, Ansible,

TEXT BOOKS:

1. Joakim Verona., Practical DevOps, Packt Publishing, 2016.

REFERENCE BOOKS:

1. Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint. Wiley publications.
2. Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley.

LINUX PROGRAMMING
(PROFESSIONAL ELECTIVE – I)

L	T	P	C
3	0	0	3

B.Tech III Year I Semester
Course Code: A225528

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

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

UNIT-I

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

UNIT-II

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

UNIT-III

Files and Directories - File Concept, File types, File System Structure, Inodes, library functions kernel support for files, system calls for file I/O operations- open, create, read, write, close.
Directories- Creating, removing and changing Directories- mkdir, rmdir, chdir.

UNIT-IV

Process - Process concept, process identification, process control process- creation, waiting for a process, process termination, Kernel support for process, zombie process, orphan process.

Signals - Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT-V

Inter Process Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using unnamed pipes, FIFOs- creation, IPC between unrelated processes using FIFOs(Named pipes), differences between unnamed and named pipes, popen and pclose library functions. Message Queues- APIs for message queues Semaphores- APIs for semaphores Shared Memory- APIs for shared memory. Sockets- Introduction to Sockets, basic functions of Socket.

TEXT BOOKS:

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 – I)

L	T	P	C
3	0	0	3

B.Tech III Year I Semester
Course Code: A225529

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

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

UNIT-I

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

UNIT-II

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

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

UNIT-III

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

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

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

UNIT-IV

Work Flows of the process: Software process workflows, Inter Trans workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction planning process, Pragmatic planning. Project

Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.
Process Automation: Automation Building Blocks, the Project Environment.

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

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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PRINCIPLES OF PROGRAMMING LANGUAGES
(PROFESSIONAL ELECTIVE – I)

B.Tech III Year I Semester
Course Code: A225530

L	T	P	C
3	0	0	3

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

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

UNIT I

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

UNIT II

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

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

UNIT III

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

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

UNIT IV

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

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

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

UNIT V

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

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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COMPUTER NETWORKS LAB

B.Tech III Year I Semester
Course Code: A2255A0

L	T	P	C
0	0	2	1

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

1. Implement various network topologies and protocols of Physical and Data Link Layer
2. Design various networks and Apply Routing algorithms of Network Layer
3. Analyze the packets in Transport and Application Layer Protocols.

Programs:

Week1: Study of different types of Network cables and Implement the cross-wired cable and straight through cable and configure the Network Topology using Packet Tracer

Week 2: Implement the data link layer framing methods such as character stuffing and bit stuffing.

Week 3: Implementation of hamming code algorithm

Week 4: Implementation of CRC polynomial.

Week 5: Study of Basic Network Configuration Commands and Classification of IP address and Sub netting

Week 6: Connect the computers in Local Area Network and Observing Static and Dynamic Routing using Packet Tracer

Week 7: Implement Dijkstra's algorithm to compute the shortest path through a graph.

Week 8: Now obtain Routing table of each node using distance vector routing algorithm

Week 9: Take an example subnet of hosts. Obtain broadcast tree for it.

Week 10: Write a program for congestion control using leaky bucket algorithm.

Week 11: Capture and Analyze the Packets using Wire shark for the following Protocols IPv4, TCP, UDP

Week 12: Capture and Analyze the Packets using Wire shark for the following Protocols HTTP, DNS

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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WEB TECHNOLOGIES LAB

L	T	P	C
0	0	2	1

B.Tech III Year I Semester
Course Code: A2255A1

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

1. Design static web pages that perform client side authentication.
2. Understand XML data representation.
3. Create dynamic web application using PHP and access database.
4. Implement sessions in web applications
5. Design dynamic web applications using MVC architecture.

LIST OF EXPERIMENTS

Week 1: Create a Registration page using HTML.

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

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

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

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

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

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

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

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

Week 10: Installation and configuration of Tomcat and deploy a simple "Hello World" servlet.

Week 11: Write a servlet that reads request parameters from the registration page created in the first experiment and stores in the database.

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

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

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

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

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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SKILL DEVELOPMENT COURSE
(UI DESIGN-FLUTTER)

B.Tech. III Year I Sem.
Course Code: A2255A8

L	T	P	C
0	0	2	1

Course Outcomes:

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

1. Knowledge on installation of various softwares.
2. Understanding of various widgets.
3. Application of animation to app.

WEEK 1:
Installation of Android studio & Flutter.

WEEK 2:
Create an application using Flutter to print hello world.

WEEK 3:
Create an application to implement Decision making and loops using Dart.

WEEK 4:
Create an application to demonstrate user defined functions using Dart.

WEEK 5:
Create an application to implement object oriented programming using Dart.

WEEK 6:
Create an application for platform basic widgets (Text, Image, and Icon).

WEEK 7:
Create an application for Layout widgets (Single child, Multiple Child).

WEEK 8:
Create an application to demonstrate Gesture Detector.

WEEK 9 & 10:
Create an application for Registration form.

WEEK 11:
Create an application to implement flutter calendar.

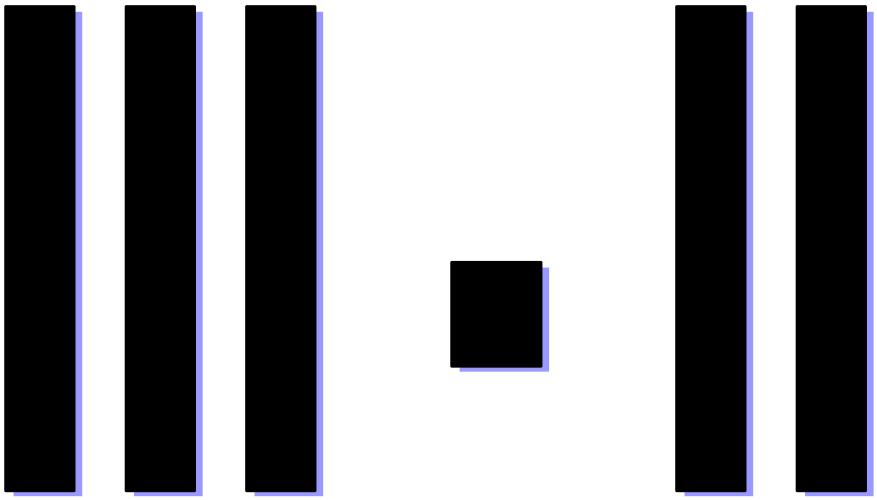
WEEK 12:
Create an application to implement Animated Text in Flutter.

TEXT BOOKS:

1. Marco L. Napoli, Beginning Flutter: A Hands-on Guide to App Development, 1st edition, Wrox publisher.

REFERENCE BOOKS:

1. Flutter for Beginners: An introductory guide to building cross-platform mobile applications with Flutter and Dart 2, Packt Publishing Limited.
2. Rap Payne, Beginning App Development with Flutter: Create Cross-Platform Mobile Apps, 1st edition, Apress.
3. Frank Zammetti, Practical Flutter: Improve your Mobile Development with Google's Latest Open-Source SDK, 1st edition, Apress



VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DATA WAREHOUSING & DATA MINING

B.Tech III Year II Semester
Course Code: A226554

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT – I

Data Warehouse and OLAP Technology:

What is Data Warehouse?, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data ware housing to data mining.

UNIT – II

Introduction to Data Mining:

Motivation and Importance of Data mining, What is Data mining?, Data Mining on various kinds of Data, Data Mining Functionalities, 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:

Introduction to Classification and Prediction, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back Propagation, Support Vector Machines, Lazy Learners, 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, Outlier Analysis

TEXT BOOKS:

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

REFERENCE BOOKS:

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.

COMPILER DESIGN

B.Tech III Year II Semester
Course Code: A226555

L	T	P	C
3	1	0	4

Course Outcomes:

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

1. Formulate tokens for various programming languages.
2. Apply principles of parsing techniques to do syntax analysis.
3. Formulate semantic rules to do semantic analysis.
4. Apply optimization techniques on the intermediate code.
5. Generate the target code.

UNIT-I:

Introduction to Compilers: Structure of Compiler-Phases of Compiler, Symbol Table Management, Grouping of Phases into Passes, Compiler Vs Interpreter.

Lexical Analysis: Role and need of Lexical Analyzer, Input Buffering, Regular expressions for identifiers, Signed numbers etc.., A Language for specifying Lexical Analyzer, Lexical phase errors.

UNIT-II:

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

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

UNIT-III:

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

UNIT-IV:

Syntax Directed Translation: Syntax Directed Translation schemes, Intermediate codes, Postfix notation, Three Address code, Quadruples and triples..

Run-Time Environments: Storage allocation strategies, Stack allocation of space, Access to non-local names

.Symbol table: Contents of Symbol table, Data Structures for symbol tables, representing scope information

UNIT-V:

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

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

TEXT BOOKS:

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.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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AGILE METHODOLOGIES
(PROFESSIONAL ELECTIVE-II)

B.Tech. III Year II Sem.
Course Code: A226556

L	T	P	C
3	0	0	3

Course Outcomes:

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

1. Identify basic concepts of agile methodology and Extreme programming
2. Analyze real customer involvement in collaboration
3. Discuss risk management and iteration planning
4. Understanding incremental requirements, refactoring, incremental design and architecture

UNIT - I

Introduction Extreme Programming (XP) - Agile Development: Why Agile?, Understanding Success, Beyond Deadlines, Importance of Organizational Success, Introduction to Agility, Agile methods-Scrum and XP, Manifesto for Agile Software Development, Principles of Agile Process. Understanding XP (Extreme Programming) - XP life cycle, XP team, XP Concepts, Adopting XP - Knowing whether XP is suitable, Implementing XP, assessing Agility, Practicing XP - Thinking, Pair Programming, Energized work, Informative Workspace, Root cause Analysis, Retrospectives.

UNIT - II

Collaborating: Trust, Sit together, Real customer involvement, Ubiquitous language, Stand-Up meetings, coding standards, Iteration demo, Reporting.

UNIT - III

Releasing: Bugfree Release, Version Control, Ten-Minute Build, continuous integration, Collective ownership and Documentation.

UNIT – IV

Planning: Version, Release Planning, The Planning Game, Risk Management, Iteration Planning, Slack, Stories and Estimating

UNIT - V

Developing: Incremental requirements, Customer tests, Test driven development, Refactoring, Incremental design and architecture, spike solutions, Performance optimization, Exploratory testing.

TEXT BOOK:

1. The art of Agile Development, James Shore and Shane Warden, 11th Indian Reprint, O'Reilly,2018.

REFERENCE BOOKS:

1. Learning Agile, Andrew Stellman and Jennifer Greene, O'Reilly, 4th Indian Reprint, 2018.
2. Practices of an Agile Developer, Venkat Subramaniam and Andy Hunt, SPD, 5th Indian Reprint,2015
3. Agile Project Management - Jim Highsmith, Pearson Low price Edition 2004

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DISTRIBUTED DATABASES
(PROFESSIONAL ELECTIVE-II)

B.Tech III Year II Semester
Course Code: A226557

L	T	P	C
3	0	0	3

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

1. Understand theoretical and practical aspects of distributed database systems.
2. Study and identify various issues related to the development of distributed database systems.
3. Understand the design aspects of object-oriented database systems and related developments.

UNIT - I
Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.
Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture.
Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

UNIT - II
Query processing and decomposition: Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data.
Distributed query Optimization: Query optimization, centralized query optimization, distributed query, optimization algorithms.

UNIT - III
Transaction Management: Definition, properties of transaction, types of transactions, **Distributed concurrency control:** serializability, concurrency control mechanisms & algorithms, time - stamped & optimistic concurrency control Algorithms, deadlock Management.

UNIT - IV
Distributed DBMS Reliability: Reliability concepts and measures, fault-tolerance in distributed systems, failures in Distributed DBMS, local & distributed reliability protocols, site failures and network partitioning.
Parallel Database Systems: Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

UNIT – V

Distributed object Database Management Systems: Fundamental object concepts and models, object distributed design, architectural issues, object management, distributed object storage, objectquery Processing.

Object Oriented Data Model: Inheritance, object identity, persistent programming languages, persistence of objects, comparison OODBMS and ORDBMS

TEXT BOOKS:

1. M. Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.
2. Stefano Ceri and Giuseppe Pelagatti: Distributed Databases, McGraw Hill.

REFERENCE BOOK:

1. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom: "Database Systems: The Complete Book", Second Edition, Pearson International Edition.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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OBJECT ORIENTED ANALYSIS & DESIGN
(PROFESSIONAL ELECTIVE-II)

B.Tech III Year II Semester
Course Code: A226558

L	T	P	C
3	0	0	3

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

1. Understand Object Oriented Software Development Process
2. Construct class and object diagrams for the given scenario
3. Model interaction diagrams, use case diagrams and activity diagrams for a given project
4. Design State diagrams involving processes and threads
5. Apply 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.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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COMPUTER VISION
(PROFESSIONAL ELECTIVE-II)

L	T	P	C
3	0	0	3

B.Tech III Year II Semester
Course Code: A226559

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

1. Understanding Computer Vision and Image Processing Basics
2. Understanding the functionalities of different types of Cameras and Hence Lenses
3. Understanding Features Extraction of the image
4. Analysis of the Image Segmentation Techniques
5. Comprehension of Motion Analysis and shape of the object

UNIT – I

Introduction to Computer Vision: Computer Imaging Systems, Digital Image Formation and Low-Level Processing, Overview and State-of-the-art, Fundamentals of Image Formation, Transformation: Orthogonal, Euclidean, Affine, Projective, etc; Fourier Transform, Convolution and Filtering, Image Enhancement, Restoration, Histogram Processing.

UNIT – II

Depth Estimation and Multi-Camera Views: Perspective, Binocular Stereopsis: Camera and Epipolar Geometry; Homography, Rectification, DLT, RANSAC, 3-D Reconstruction Framework; Auto-Calibration.

UNIT – III

Feature Extraction: Edges - Canny, LOG, DOG; Line Detectors (Hough Transform), Corners - Harris and Hessian Affine, Orientation Histogram, SIFT, SURF, HOG, GLOH, Scale-Space Analysis- Image Pyramids and Gaussian Derivative Filters, Gabor Filters and DWT.

UNIT – IV

Image Segmentation: Region Growing, Edge Based Approaches to Segmentation, Graph-Cut, Mean-Shift, MRFs, Texture Segmentation; Object Detection

UNIT – V

Motion Analysis : Background Subtraction and Modeling, Optical Flow, KLT, Spatio-Temporal Analysis, Dynamic Stereo;Motion parameter estimation.

Shape from X : Light at Surfaces; Phong Model; Reflectance Map; Albedo Estimation; Photometric Stereo; Use of Surface Smoothness Constraint; Shape from Texture, Colour, Motion and Edges.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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DATA WAREHOUSING AND DATA MINING LAB

L	T	P	C
0	0	2	1

B.Tech III Year II Semester
Course Code: A2265B0

Course Outcomes:

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

1. Understand the fundamentals of Data warehousing& Mining using Weka Tool
2. Outline 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.

List of Experiments:

WEEK1 – WEEK2:

I. Introduction to data mining using Weka/Python/R-Tool.
II. Experiment the following in Weka Tool.
Demonstrate how to create .Arff file and perform Data Preprocessing Techniques

WEEK3:

Demonstrate the following data preprocessing tasks using python libraries

- Loading the dataset
- Dealing with missing data

WEEK4:

Demonstrate the following data preprocessing tasks using python libraries

- Dealing with categorical data
- Scaling the features.
- Splitting dataset into Training and Testing Sets

WEEK5:

Generate frequent item sets using Apriori Algorithm in python and also generate association rules for any market basket data.

WEEK6:

Generate frequent item sets using FP-Growth Algorithm in python and also generate association rules for any market basket data.

WEEK7-WEEK8

Build the following classification Algorithms in Python :

- Decision Tree
- Naïve Bayes
- K-NN

WEEK9:
Build a model using linear regression algorithm on any dataset using python

WEEK10:
Demonstrate the following Similarity and Dissimilarity Measures using python

- Euclidean Distance
- Manhattan Distance
- Minkowski Distance

WEEK11:
Apply the following clustering algorithms in python:

- K-Means
- Hierarchical
- DBSCAN

WEEK12:
Analyze German Credit Data Assessment using various Data mining Techniques

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IV - I

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BIG DATA ANALYTICS

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275E7

Course Outcomes:

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 BOOKS:

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.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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CLOUD COMPUTING AND SECURITY

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275E8

Course Outcomes:

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

1. Understand different Cloud Services
2. Recall and summarize migration and integration services into cloud
3. Analyze various enterprise applications in cloud computing
4. Understand and apply the virtualization concepts
5. Explain the basic threats and data security mechanism 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, new integration scenarios, the integration Methodologies, SaaS Integration Services.

UNIT - III

The Enterprise Cloud Computing Paradigm: Introduction, 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: Background and Related Work, Virtual Machines Provisioning and Manageability, Virtual Machine Migration Services, VM Provisioning and Migration in Action

Secure Distributed Data Storage in Cloud Computing: Introduction, Cloud Storage: from LANs TO WANs, Technologies for Data Security in Cloud Computing

UNIT - V

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, Digital Identity and Data Security.

TEXT BOOKS:

1. Rajkumar Buyya, James Broberg, Andrzej Goscinski, 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.

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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FUNDAMENTALS OF MACHINE LEARNING
(Professional Elective - III)

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275E9

Course Outcomes:

1. Ability to identify machine learning problems corresponding to different applications.
2. Ability to understand the basic concepts such as Decision trees and Neural Networks.
3. Apply Machine Learning algorithms to solve problems of moderate complexity.
4. Identify Machine Learning applications
5. Understand Genetic algorithms and their applications

UNIT-I

Introduction and Concept Learning:

Well posed learning problems, designing a learning system Perspectives and issues in machine learning, Types of learning. Concept learning task, Concept Learning as search through a hypothesis space, Finding maximally specific hypotheses, Version spaces and the candidate elimination algorithm, Inductive Bias

UNIT-II

Decision Tree learning and Neural Network learning: Decision Tree representation and learning algorithm, appropriate problems for Decision Tree Learning, Hypothesis space search in Decision Tree Learning, Inductive bias in Decision Tree Learning: Occam's razor, Issues in Decision Tree Learning.

Introduction to Neural Network Learning, Introduction to Perceptions, Perceptions, Introduction to Gradient Descent and Back propagation.

UNIT-III

Support Vector Machines: Introduction, LinearClassifier, Non-linear Classifier, Training SVM, Support Vector Regression.

Bayesian Learning:

Bayes theorem and concept learning, Minimum Description Length Principle, Bayes optimal classifier, Gibbs Algorithm, Naïve Bayes Classifier, The EM algorithm.

UNIT-IV

Instance-based Techniques: Introduction to Instance-based Techniques, Lazy vs. eager generalization, K nearest neighbor, Radial Basis Function, Case Based reasoning, Remarks on Lazy vs Eager learning.

UNIT – V

Genetic Algorithm: Biological motivation, Representing Hypothesis, Genetic Operators, Fitness function and selection, Hypothesis space search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms.

TEXT BOOKS:

1. Machine Learning - Mc Graw Hill, Tom M. Mitchell.

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

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

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275F0

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

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

UNIT-I:

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

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

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

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

UNIT-V:
IoT Physical Servers and Cloud Offerings Introduction to Cloud Storage models and communication APIs. Web server Web server for IoT, Cloud for IoT, Python web application framework designing a RESTful web API.
Case study: Amazon web services for IoT.

TEXT BOOK:

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.

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MOBILE APPLICATION DEVELOPMENT
(Professional Elective - III)

B.Tech IV Year I Semester
Course Code: A2275F1

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. Learn & Analyze about various Data Persistence schemes
4. Implement background services Multithreading Networking, Broadcast Receivers and Telephony Manager
5. Understand and Implement Location based services

UNIT-I

Introduction to Mobile Applications & Android Studio

Introduction: Types of Mobile Applications, 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. Professional Android 4 Application Development by Reto Meier.
2. Beginning Android Programming with Android Studio, 4th Edition , J. F. DiMarzio Published by. John Wiley & Sons, Inc., Indianapolis, Indiana

REFERENCE BOOKS:

1. Dawn Griffiths, David Griffiths,"Head First: Android Development" ,OReilly2015,ISBN: 9781449362188

DEEP LEARNING
(Professional Elective-III)

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275F2

Course Outcomes:

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

1. Have a good understanding of the fundamental issues and basics of deep learning
2. Understand the concept of CNN to apply it in the Image classification problems
3. Learning and understanding the working of various RNN methods
4. Learning and understanding the working of various Autoencoders methods
5. Use Transfer Learning to solve problems with high dimensional data including image and speech

UNIT-I

Deep Learning: Fundamentals, Introduction, Building Block of Neural Networks, Layers, MLPs, Forward pass, backward pass, class, trainer and optimizer, The Vanishing and Exploding Gradient Problems, Difficulties in Convergence, Local and Spurious Optima, Preprocessing, Momentum, learning rate Decay, Weight Initialization, Regularization, Dropout, SoftMax, Cross Entropy lossfunction, Activation Functions.

UNIT-II

CNN: Introduction, striding and padding, pooling layers, structure, operations and prediction of CNN with layers, CNN -Case study with MNIST, CNN VS Fully Connected

UNIT-III

RNN: Handling Branches, Layers, Nodes, Essential Elements-Vanilla RNNs, GRUs, LSTM

UNIT-IV

Autoencoders: Denoising Autoencoders, Sparse Autoencoders, Deep Autoencoders, VariationalAutoencoders, GANS

UNIT-V

Transfer Learning- Types, Methodologies, Diving into Transfer Learning, Challenges

TEXT BOOKS:

1. Seth Weidman, “Deep Learning from Scratch”, O'Reilly Media, Inc., 2019
2. Ian Goodfellow, Yoshua Bengio and Aaron Courville, “Deep Learning” , MIT Press, 2015
3. Dipanjan Sarkar, Raghav Bali, “Transfer Learning in Action”, Manning Publications, 2021

REFERENCE BOOKS:

1. Giancarlo Zaccone, Md. Rezaul Karim, Ahmed Menshawy "Deep Learning with TensorFlow:Explore neural networks with Python", Packt Publisher, 2017.
2. Antonio Gulli, Sujit Pal, "Deep Learning with Keras", Packt Publishers, 2017.
3. Francois Chollet, "Deep Learning with Python", Manning Publications, 2017.

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ADVANCED DATABASES
(Professional Elective - IV)

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275F3

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 SECURITY
(Professional Elective-IV)

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275F4

Course Outcomes:

1. Identify various Security Attacks.
2. Understand various Encryption Principles and algorithms.
3. Implement Cryptography algorithms.
4. Understand various Security Associations..
5. Inferring various Security Policies.

UNIT-I

Computer and Network Security Concepts: Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, Fundamental Security Design Principles, A Model for Network Security.

Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Steganography.

UNIT - II

Block Ciphers and the Data Encryption Standard: Traditional Block Cipher Structure, The Data Encryption Standard, A DES Example, The Strength of DES, Block Cipher Design Principles.

Advanced Encryption Standard: AES Structure, AES Transformation Functions, AES Key Expansion, An AES Example.

UNIT - III

Block Cipher Operation: Multiple Encryption and Triple DES, Electronic Codebook, Cipher Block Chaining Mode, Cipher Feedback Mode, Output Feedback Mode, Counter Mode

Asymmetric Ciphers: Principles of Public-Key Cryptosystems, The RSA Algorithm, Diffie-Hellman Key Exchange, Elgamal Cryptographic System , Elliptic Curve Cryptography.

UNIT - IV

Data Integrity Algorithms: Applications of Cryptographic Hash Functions, Secure Hash Algorithm

Message Authentication Codes: Message Authentication Requirements, Message Authentication Functions, MACs Based on Hash Functions: HMAC, Digital Signatures, X.509 Certificates, Kerberos

UNIT - V

Electronic Mail Security, Internet Mail Architecture ,Email Formats , Email Threats and Comprehensive Email Security ,S/MIME, Pretty Good Privacy , HTTPS,

IP Security IP Security Overview, IP Security Policy.

TEXT BOOK:

1. Cryptography and Networks Security (Principles and Practice) by William Stallings Pearson Education, 7th 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.

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NATURAL LANGUAGE PROCESSING
(Professional Elective - IV)

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester

Course Code: A2275F5

Course Outcomes:

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

1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
3. Manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
4. Design, implement, and analyze NLP algorithms; and design different language modeling Techniques.

UNIT-I

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models

Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches, Features.

UNIT-II

Syntax I: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms.

UNIT-III

Syntax II: Models for Ambiguity Resolution in Parsing, Multilingual Issues, Semantic **Parsing I:** Introduction, Semantic Interpretation, System Paradigms, Word Sense.

UNIT-IV

Semantic Parsing II: Predicate-Argument Structure, Meaning Representation Systems.

UNIT-V

Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Bayesian parameter estimation, Language Model Adaptation, Language Models-class based, variable length, Bayesian topic based, Multilingual and Cross Lingual Language Modeling.

TEXT BOOKS:

1. Multilingual natural Language Processing Applications: From Theory to Practice –Daniel M. Bikel and Imed Zitouni, Pearson Publication.

REFERENCE BOOK:

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications.
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary.

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BLOCKCHAIN TECHNOLOGIES
(Professional Elective - IV)

L	T	P	C
3	0	0	3

B.Tech IV Year I Semester
Course Code: A2275F6

Course Outcomes:

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

1. Understand the Cryptography and Block Chain
2. Discuss about Generic elements of blockchain
3. Demonstrate various methods and routes of Decentralization
4. Analyze the concepts of Bitcoin
5. Apply Block chain in Real time scenario.

UNIT - I

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

UNIT - II

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

UNIT - III

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

UNIT - IV

Introducing Bitcoin: Digital keys and addresses, Transactions, Block Chain, Mining, The Bitcoin Network.

UNIT - V

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

TEXT BOOKS:

1. Imran Bashir, Mastering Block chain, Packt Publishing, 2018.
2. Vikram Dhillon, David Metcalf, MaxHooper, Blockchain Enabled Applications, 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).

BIG DATA ANALYTICS LAB

L	T	P	C
0	0	2	1

B.Tech IV Year I Semester
Course Code: A2275C2

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, 8:

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

Week 9, 10:

7. 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.

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FUNDAMENTALS OF MACHINE LEARNING LAB
(Professional Elective - III Lab)

B.Tech IV Year I Semester
Course Code: A2275C3

L	T	P	C
0	0	2	1

Course Outcomes:

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

1. Select data, model selection, model complexity and identify the trends
2. Understand a range of machine learning algorithms along with their strengths and weaknesses
3. Build predictive models from data and analyze their performance

LIST OF EXPERIMENTS

WEEK 1:

Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

Week 2:

For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of allhypotheses consistent with the training examples.

Week 3:

a. Program to calculate the entropy and the information gain
b. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.

Week 4:

a. Program to implement perceptron.
b. Build an Artificial Neural Network by implementing the Backpropagation algorithm andtest the same using appropriate data sets.

Week 5:

Write a program to implement SVM algorithm to classify the iris data set. Print bothcorrect and wrong predictions.

Week 6:

Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

Week 7:

Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set.

Week 8:

Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering.

Week 9:

Write a program to implement k-Nearest Neighbors algorithm to classify the iris dataset. Print both correct and wrong predictions.

INTERNET OF THINGS LAB

(Professional Elective - III Lab)

B.Tech IV Year I Semester
Course Code: A2275C4

L	T	P	C
0	0	2	1

Course outcomes:

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

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

LIST OF EXPERIMENTS

Week 1:

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:

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:

Setting up your Raspberry Pi. Installation of software.

Introduction to Raspberry Pi – Sensors & Actuators

a. Temperature & Humidity Sensor
b. Ultrasonic Sensor
c. Micro Servo Motor

Week 4:

Introduction to IoT & Sensor control with IFTTT.

Week 5:

Build a Web-App: Blinking an LED over Internet.

Build a Web-App: Control a motor over Internet when motion is detected.

Week 6:

Live Temperature and Humidity monitoring over Internet.

Week 7:

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

Week 8:

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

Week 9 & 10:

Introduction to Open Web Services for IoT

Experiments with Open Web Services for IoT:

a. M2M Labs
b. The Thing Box
c. The Thing System
d. Node-RED

Week 11:

Home Automation System.

Week 12:

Build a Restful web service for IoT Management.

Week 13:

Build a web server for IoT Management

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MOBILE APPLICATION DEVELOPMENT LAB
(Professional Elective - III Lab)

B.Tech IV Year I Semester
Course Code: A2275C5

L	T	P	C
0	0	2	1

Course outcomes:

1. Understand the working of Android OS Practically
2. Able to develop dynamic user interface applications
3. Able to Develop, Deploy and Maintain Android Applications

List of Experiments

1. Installation of Android Studio and Android Virtual Device
   Develop an android application to display "Hello World"
2. Develop an application that receives user's name, contact and city and displays the same using Layout Managers and Event Listeners.
3. Develop an application that shows names as a list and on selecting a name it should show the details of the candidate on the next screen with a "Back" button
4. Create a native calculator application.
5. Create an application that saves user information like name, age, gender etc. in shared preference and retrieves them when the program restarts.
6. Develop a Registration and Login application that makes use of database.
7. Develop an application that inserts some notifications into Notification area and whenever a notification is inserted, it should show a toast with details of the notification.
8. Develop an application that uses a menu with 3 options for dialing a number, opening a website and to send an SMS. On selecting an option, the appropriate action should be invoked using intents.
9. Create an alarm application using time picker to set alarm time.
10. Create an application that shows the given URL (from a text field) in a browser
11. Develop a native application that uses GPS location information.

DEEP LEARNING LAB
(Professional Elective - III Lab)

B.Tech IV Year I Semester
Course Code: A2275C6

L	T	P	C
0	0	2	1

Course Outcomes:

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

1. Learn the Fundamental Principles of Deep Learning.
2. Identify The Deep Learning Algorithms for various types of tasks in various domains.
3. Implement Deep Learning Algorithms and Solve Real-world problems.

LIST OF PROGRAMS:

1. Implementation of Linear Regression
2. Deep learning Packages Basics: Tensor Flow, Keras and PyTorch
3. Implementation of Neural network
4. Build your own CNN from scratch for face recognition and try to achieve the highest possible accuracy on any dataset
5. Sentiment Analysis using LSTM
6. Language Modeling using RNN
7. Sentiment Analysis using GRU
8. Image Classification with Transfer Learning
9. Case Study: Implement all deep learning pre-trained models (GooLeNet, VGGNet, AlexNet, ResNet, Xception) on any dataset and analyze the accuracy.

TEXTBOOKS:

1. Deep Learning by Ian Good fellow, Yoshua Bengio and Aaron Courville, MIT Press.
2. The Elements of Statistical Learning. Hastie, R.Tibshirani, J.Friedman, Springer.
3. Probabilistic Graphical Models. Koller and N.Friedman, MIT Press.
4. Géron, Aurélien. Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow: Concepts, tools, and techniques to build intelligent systems. O'Reilly Media, 2019.

REFERENCE BOOKS:

1. Bishop C.M. Pattern Recognition and Machine Learning, Springer, 2006.
2. Yegna narayana .B, Artificial Neural Networks PHI Learning Pvt. Ltd, 2009.
3. Golub G.H. and VanLoan C.F. Matrix Computations, JHU Press, 2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education, 2004.

EXTENSIVE READING:

- http://www.deeplearning.net
- https://www.deeplearningbook.org/
- https://developers.google.com/machine-learning/crash-course/ml-intro
- www.cs.toronto.edu/~fritz/absps/imagenet.pdf
- http://neuralnetworksanddeeplearning.com/

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IV - II

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SEMANTIC WEB AND SOCIAL NETWORKS

B.Tech IV Year II Semester
Course Code: A2285J4

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.

INTRODUCTION TO DATA SCIENCE

L	T	P	C
3	0	0	3

B.Tech IV Year II Semester
Course Code: A2285J5

Course Outcomes:

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

1. Understand the significance of data science tools and techniques.
2. Apply data cleaning, transformation and discretization techniques.
3. Analyze various inferential statistics and time-series methods.
4. Understand predictive analytics and its applications.
5. Apply data science techniques to deal with the real – world problems.

UNIT-I

Introduction: What Is Data Science, Where Do We See Data Science, How Does Data Science Relate to Other Fields, The Relationship between Data Science and Information Science, Computational Thinking, Skills for Data Science, Tools for Data Science, Issues of Ethics, Bias, and Privacy in Data Science.

UNIT-II

Data: Introduction, Data Types, Data Reduction, Data Collections, Data Preprocessing.

UNIT-III

Techniques: Introduction, Data Analysis and Data Analytics, Descriptive Analysis, Diagnostic Analytics, Predictive Analytics, Prescriptive Analytics, Exploratory Analysis, Mechanistic Analysis.

UNIT-IV

Data Collection, Experimentation, and Evaluation: Introduction, Data Collection Methods, Picking Data Collection and Analysis Methods, Evaluation.

UNIT-V

Solving Data Problems: Introduction, Collecting and Analyzing Twitter Data, Collecting and Analyzing YouTube Data, Analyzing Yelp Reviews and Ratings

TEXT BOOKS:

1. A Hands-On Introduction to Data Science, Chirag Shah, Cambridge University Press, 2020.
2. EMC Education Services "Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", Wiley Publishers, 2012.

REFERENCE BOOKS:

1. Neil A.Weiss,"IntroductoryStatistics",10th Edition, Pearson Education Limited,2017.
2. JiaweiHan, Micheline Kamber and JianPei, DataMining: Concepts and Techniques, 3rd ed.

E – COMMERCE

B.Tech IV Year II Semester
Course Code: A2285J6

L	T	P	C
3	0	0	3

Course Outcomes:

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

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

UNIT-I

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

UNIT-II

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

UNIT-III

Intra Organizational Commerce and work Flow, Automation, Customization, Internal Commerce, Supply chain Management.

UNIT-IV

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

UNIT-V

Consumer Search and Resource Discovery

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

TEXT BOOK:

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

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.

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BASICS OF OPERATING SYSTEMS

(Open Elective – 1)

B.Tech III Year I Semester
Course Code: A225531

L	T	P	C
3	0	0	3

Course Outcomes:

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

1. Understand the basic functions of Computer System and Operating system.
2. Analyze process scheduling and synchronization.
3. Analyze various memory allocation techniques for effective utilization of memory.
4. Understand various file concepts for effective storage.
5. Understand the concept deadlock.

UNIT-I:

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

UNIT-II:

Process Management – Process concepts threads, scheduling-criteria algorithms, their evaluation.

Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization.

UNIT-III:

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

UNIT-IV:

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, and file sharing, protection.

File System implementation- File system structure, file system implementation, directory implementation, directory implementation, allocation methods.

UNIT-V:

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix.

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

TEXT BOOKS:

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

REFERENCES BOOKS:

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

CORE JAVA PROGRAMMING
(Open Elective – 1)

B.Tech III Year I Semester
Course Code: A225532

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Understanding of OOP concepts and basics of java programming
2. Analyze the concepts of Java programming in problem solving
3. Identify the concepts of packages and interfaces in java.
4. Analyze the usage of Exception handling and Multithreading in complex programs
5. Indentify the GUI applications and Applets

UNIT-I

OOPs concepts - Data abstraction, encapsulation, inheritance, benefits of inheritance, polymorphism, classes and objects, Procedural and object oriented programming paradigms.

Java Programming History of Java, Java buzzwords, comments, data types, variables, constants, scope and life time of variables, operators, expressions, type conversion and casting, enumerated types, control flow block scope, conditional statements, loops, break and continue statements, simple java stand alone programs, arrays.

UNIT-II

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

Inheritance : Inheritance types , super keyword, Method Overriding, Abstract Classes, final with inheritance

UNIT-III

Interfaces: Defining an interface, implementing interfaces, and accessing implementations through interface references, extending interfaces. Interfaces vs. Abstract classes.

Packages: Defining, Creating and Accessing a Package, Understanding Class path, Importing Packages, Member access rules

UNIT-IV

Exception Handling: Concepts of Exception Handling, Benefits of Exception Handling, Exception Hierarchy, Usage of try, catch, throw, throws and, finally, Built in Exceptions, Creating Own Exception Sub Classes.

Concepts of Multithreading: differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, thread priorities, daemon threads

UNIT-V

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

AWT controls: Button, Label, TextField, TextArea, Checkbox, and CheckboxGroups, List, Choice, Layout Managers - Flow, Border, Grid, Card and Gridbag

Applets: Concepts of Applets, Differences between Applets and Applications, Life Cycle of an Applet, Creating Applets, Passing Parameters to Applets.

TEXT BOOKS:

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

REFERENCE BOOKS:

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

FUNDAMENTALS OF COMPUTER NETWORKS
(Open Elective - 1)

B.Tech III Year I Semester
Course Code: A225533

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

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

UNIT-I

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

UNIT-II

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

UNIT-III

Network Layer: Network Layer Design issues, Routing algorithms - shortest path, flooding, Distance Vector Routing.
Internetworking: IP addresses, IPv4, IPv6 Protocol.

UNIT-IV

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

UNIT-V

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS
(Open Elective - 2)

B.Tech III Year II Semester
Course Code: A226560

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

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

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

TEXT BOOKS:

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

REFERENCES BOOKS:

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

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY
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SOFTWARE ENGINEERING FUNDAMENTALS
(Open Elective - 2)

B.Tech III Year II Semester
Course Code: A226561

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

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

UNIT-I

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

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

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

UNIT-II

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

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

UNIT-III

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

Creating an architectural design: Software architecture, Data design, Architectural styles and patterns.

UNIT IV

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

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

UNIT V

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

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

TEXT BOOKS:

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

REFERENCES:

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

WEB DESIGN
(Open Elective - 3)

B.Tech IV Year I Semester
Course Code: A2275F7

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Understand the HTML tags
2. Understand different style sheets.
3. Analyze the client side scripting through JavaScript
4. Analyze the server side scripting language through PHP
5. Examine the server side programming using JSP

UNIT-I

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

UNIT-II

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

UNIT-III

Client Side Scripting: JavaScript language- Declaring variables, scope of the variables, functions, Objects in Java Script, Dynamic HTML with Java Script, Form validation.

UNIT-IV

Introduction to PHP: Variable Declaration, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc.

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. binary files, listing directories. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.

UNIT-V

Introduction to JSP: The Anatomy of a JSP Page; JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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IoT AND APPLICATIONS
(Open Elective - 3)

B.Tech IV Year I Semester
Course Code: A2275F8

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

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

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

TEXTBOOKS:

1. Jan Holler Vlasios Tsiatsis Catherine Mulligan Stamatis Karnouskos Stefan Avesand David Boyle,"From Machine –to-Machine to the Internet of Things"
2. Vijay Madisetti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach"

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FUNDAMENTALS OF CYBER SECURITY
(Open Elective - 3)

B.Tech IV Year I Semester
Course Code: A2275F9

L	T	P	C
3	0	0	3

Course Outcomes:

At the end of the course student would be able to

1. Identify various cybercrimes.
2. Understand the tools and methods used in cyber crimes.
3. Understand computer forensics.
4. Identify various tools for computer forensics.
5. Discuss the importance of cyber security.

UNIT-I

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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

TEXTBOOKS:

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

REFERENCES:

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