

BACHELOR OF TECHNOLOGY

INFORMATION TECHNOLOGY

COURSE STRUCTURE & SYLLABUS

(Batches admitted from the Academic Year 2024-2025)



MALLAREDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India)

Programmes Accredited by NBA & NAAC with 'A+' Grade

National Ranking by NIRF–Rankband(151-300), MHRD, Govt. of India

Approved by AICTE, Affiliated to JNTUH, ISO 9001:2015 Certified Institution

Maisammaguda, Dhulapally, Kompally, Secunderabad, -500100.

IT-COURSE STRUCTURE (R24)

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COURSE STRUCTURE

I Year B. Tech – I Semester (I Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2400BS01	Linear Algebra and Differential Equations	3	1	0	4	40	60
2	2405ES01	Programming for Problem Solving	3	0	0	3	40	60
3	2400BS06	Engineering Chemistry	3	0	0	3	40	60
4	2403ES01	Computer Aided Engineering Graphics	1	0	4	3	40	60
5	2400HS01	English for Skill Enhancement	2	0	0	2	40	60
6	2400BS62	Engineering Chemistry Lab	0	0	2	1	40	60
7	2400HS61	English Language And Communication Skills Lab	0	0	3	1.5	40	60
8	2405ES61	Programming for Problem Solving Lab	0	0	5	2.5	40	60
	2400MC02	French Language/ German*	2	0	0	0	100	0
		Induction Programme						
		TOTAL	14	1	14	20	420	480

I Year B. Tech – II Semester (II Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2400BS02	Numerical Techniques and Vector Calculus	3	1	0	4	40	60
2	2405ES02	Data Structures and Algorithms	3	0	0	3	40	60
3	2402ES01	Basic Electrical And Electronics Engineering	3	0	0	3	40	60
4	2400BS05	Applied Physics	3	1	0	4	40	60
5	2403ES61	Engineering Workshop	0	0	3	1.5	40	60
6	2402ES61	Basic Electrical and Electronics Engineering Lab	0	0	2	1	40	60
7	2405ES62	Data Structures and Algorithm lab	0	0	5	2.5	40	60
8	2400BS61	Applied Physics lab	0	0	2	1	40	60
	2400MC01	Environmental Science*	2	0	0	0	100	0
		TOTAL	14	2	12	20	420	480

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

II Year B. Tech – I Semester (III Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2412PC01	Mathematical Foundations of Computer Science	3	0	0	3	40	60
2	2405PC05	Computer Organization & Architecture	3	0	0	3	40	60
3	2405PC04	Object Oriented Programming through Java	3	1	0	4	40	60
4	2405PC08	Database Management Systems	3	1	0	4	40	60
5	2400HS03	Business Economics and Financial Analysis	3	0	0	3	40	60
6	2405PC63	Object Oriented Programming through Java Lab	0	0	3	1.5	40	60
7	2405PC64	Database Management Systems Lab	0	0	3	1.5	40	60
8	2400MC03	Human Values and Professional Ethics	2	0	0	0	100	0
		TOTAL	17	2	6	20	420	480

II Year B. Tech – II Semester (IV Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2400BS04	Probability & Statistics	3	0	0	3	40	60
2	2405PC01	Software Engineering	3	0	0	3	40	60
3	2405PC10	Computer Networks	3	0	0	3	40	60
4	2412PC25	Automata theory and Compiler Design	3	0	0	3	40	60
5	2405PC02	Operating Systems	3	0	0	3	40	60
6	2400HS05	Design Thinking	0	0	2	1	40	60
7	2412PC61	Software Engineering & Computer Networks Lab	0	0	2	1.5	40	60
8	2405PC62	Operating Systems Lab	0	0	2	1.5	40	60
9	2412PR01	Field Project / Real Time Project	0	0	2	1	40	60
9	2400MC04	Indian Constitution *	2	0	0	0	100	0
		TOTAL	17	0	8	20	420	480

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

III Year B. Tech – I Semester (V Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2405PC07	Design and Analysis of Algorithms	3	1	0	4	40	60
2	2405PC12	DevOps	3	0	0	3	40	60
3	2412PE01	Professional Elective-I Mobile Computing	3	0	0	3	40	60
	2405PE02	Computer Graphics & Multimedia						
	2405PE01	Object Oriented Analysis & Design						
	2462PE16	Cyber Security Essentials						
	2467PE02	Distributed Systems						
	2467PE06	Text Analytics						
4	2405PE05	Professional Elective-II Software Architecture & Design Patterns	3	0	0	3	40	60
	2466PE07	Computer Vision						
	2466PE13	Deep Learning Techniques						
	2412PE02	Software Requirements & Estimation						
	2405PE06	Distributed Computing						
	2412PE02	Data Warehousing and Data Mining						
5		Open Elective-I	3	0	0	3	40	60
6	2405PC66	Design and Analysis of Algorithms Lab	0	0	3	1.5	40	60
7	2412PC65	DevOps Lab	0	0	3	1.5	40	60
8	2412PR02	Innovative Product Development-1	0	0	2	1	40	60
9	2400MC05	Technical Communications and Soft Skills*	2	0	0	0	100	0
		TOTAL	17	1	8	20	420	480

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

III Year B. Tech – II Semester (VI Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2400HS02	Professional English	3	0	0	3	40	60
2	2466PC02	Machine Learning	3	1	0	4	40	60
3	2412PC03	Full Stack Development	3	0	0	3	40	60
4		Professional Elective – III						
	2412PE04	Software Metrics	3	0	0	3	40	60
	2412PE05	Mobile Application and API Development						
	2412PE06	Internet of Things						
	2462PE25	Social Media Security						
	2412PE04	Distributed Database						
	2412PE03	Information Retrieval Systems						
5		Open Elective-II	3	0	0	3	40	60
6	2466PC62	Machine Learning Lab	0	0	3	1.5	40	60
7	2412PC64	Full Stack Development Lab	0	0	3	1.5	40	60
8	2412PR03	Innovative Product Development-2	0	0	2	1	40	60
9	2400MC06	Indian Tradition Knowledge *	2	0	0	0	100	0
		TOTAL	17	1	8	20	420	480

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree. Industry Oriented Mini Project/ Internship - During Summer Vacation - Evaluation in IV-I

IV Year B. Tech – I Semester (VII Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2400HS07	Organizational Behavior	3	0	0	2	40	60
2	2412PC05	Cryptography and Network Security	3	0	0	3	40	60
3	2412PC04	Cloud Computing	3	0	0	3	40	60
4	2405PE04	Professional Elective-IV Agile Software Development	3	0	0	3	40	60
	2405PE07	Block Chain Technology						
	2412PE07	Mobile Application Security						
	2467PE07	Data Science with R Programming						
	2466PE05	Large Language Model						
	2466PE03	Cognitive Computing						
5		Open Electives-III	3	0	0	3	40	60
6	2412PC63	Cryptography and Network Security Lab	0	0	3	1	40	60
7	2412PC66	Cloud Computing Lab	0	0	3	1	40	60
8	2412PR04	Innovative Product Development-3	0	0	2	1	40	60
9	2412PR05	Industry Oriented Mini Project / Internship	0	0	0	1	40	60
10	2412PR06	Research Project-I	0	0	8	2	40	60
11	2400MC07	Gender Sensitization*	2	0	0	0	100	0
		TOTAL	17	0	16	20	460	540

*Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree

*Summer between III & IV Year: Mini Project

IV Year B. Tech – II Semester (VIII Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks	
							INT	EXT
1	2467PE08	Professional Elective – V Social Network Analytics	3	0	0	3	40	60
	2412PE05	Human Computer Interaction						
	2466PE09	Game Theory						
	2462PE28	Information Security Management.						
	2467PE19	Data Wrangling						
	2466PE14	Natural Language Processing						
2	2405PE08	Professional Elective – VI Software Process & Project Management	3	0	0	3	40	60
	2412PE06	e-Commerce						
	2466PE10	Augmented Reality & Virtual Reality						
	2462PE17	Digital Forensics						
	2467PE15	Big Data Architecture-Spark						
	2466PE06	Generative Artificial Intelligence						
3		Open Electives-IV	3	0	0	3	40	60
4	2412PR07	Technical Seminar	0	0	2	1	100	0
5	2412PR08	Innovation Startup & Entrepreneurship	0	0	4	2	40	60
6	2412PR09	Research Project-II	0	0	16	8	50	100
7	2400MC08	Research methodology and Intellectual Property Rights*	2	0	0	0	100	0
		TOTAL	11	0	22	20	400	300

Semester	I-I	I-II	II-I	II-II	III-I	III-II	IV-I	IV-II	TOTAL
Credits	20	20	20	20	20	20	20	20	160

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List of Open Electives offered by Various Departments for B.Tech. III & IV Year

Department	Open Elective-I	Open Elective-II	Open Elective-III	Open Elective-IV
CSE	1. Fundamentals of DBMS (2405OE01) 2. Automata Theory & Compiler Design (2405OE02) 3. Principles of Operating Systems (2205OE03) 4. Design and Analysis of Algorithms (2205OE04)	1. Data Structures Using Python (2205OE05) 2. Advanced Compiler Design (2205OE06) 3. Principles of Software Engineering (2205OE07) 4. Principles of Programming Languages (2205OE08)	1. Java Programming (2205OE09) 2. Software Testing Methodologies (2205OE10) 3. Linux Programming (2205OE11) 4. Object Oriented Analysis and Design (2205OE12)	1. Data and Knowledge Mining (2205OE13) 2. Full Stack Web Application Development (2205OE14) 3. Distributed Computing (2205OE15) 4. Block chain Technologies (2205OE16)
IT	1)2412OE01-Computer Architecture 2)2412OE02- Cloud Architecture and Services 3)2412OE03- Open Source Software Development 4)2412OE04- Advanced Computer Networks	1)2412OE05- Front End UI and Frame Work 2)2412OE06-Digital Forensics 3)2412OE07-Algorithms Design and Analysis. 4)2412OE08-.Android Application Development.	1)2412OE09- Modern Cryptography 2)2412OE10-Soft Computing 3)2412OE11-Deep Learning Technology 4)2412OE12- Web Mining and Analytics	1)2412OE13-Web Design and Management. 2)2412OE14-Machine Learning Techniques 3)2412OE15-Big Data Analytics 4)2412OE16-Game Development
AIML	1. Neural Networks (2466OE01) 2. Knowledge Representation & Reasoning (2466OE02) 3. Design Patterns using Python (2466OE03) 4. Nature Inspired Computing (2466OE04)	1. Artificial Intelligence (2466OE05) 2. Game Theory and Decision Making (2466OE06) 3. Optimization Techniques for Machine Learning (2466OE07) 4. Edge Computing for AI (2466OE08)	1. Deep Learning using python (2466OE09) 2. Interactive AI: Gaming and Simulations (2466OE10) 3. Natural Language Processing & Applications (2466OE11) 4. Quantum Computing (2466OE08)	1. Generative Adversarial Networks (2466OE12) 2. Generative AI (2466OE13) 3. Large Language Models (2466OE14) 4. Cognitive Computing & Applications (2466OE15)

DS	1.	1.	1.	1.
CS	1)24620E01-Ethical Hacking 2)24620E02-Cyber Security Essentials 3)24620E03-Web and Database Security 4)24620E04-Social Media Security	1)24620E05-Cloud Security Essentials 2)24620E06-Vulnerability Assessment & Penetration Techniques 3)24620E07-Cyber Security Policies and Regulations 4)24620E08-Security economics and policy	1)24620E09-Cyber Security Design and analysis 2)24620E10-Authorization and Authentication Techniques 3)24620E11-Network Management System and operations 4)24620E12-Cyber Security Risk Management	1)24620E13-Security incident & Response Management 2)24620E14-CyberSecurity & Laws 3)24620E15-Computer Security and audit assurance 4)24620E16-Applications of AI in Cyber Security
ECE	1. Fundamentals of Communication Systems (2204OE01) 2. Computer Organization (2204OE02) 3.Introduction Signals and Systems (2204OE03) 4. Sensors and Actuators (2204OE04)	1. Principles of Electronics Communication (2204OE05) 2. Computer Architectures (2204OE06) 3. Image and Video Processing(2204OE07) 4. Fuzzy Logic and Neural Networks (2204OE08)	1. Wireless Communication and Networks (2204OE09) 2. Introduction to IoT (2204OE10) 3. Pattern Recognition(2204OE11) 4. Embedded System Design (2204OE12)	1. 5G Technology (2204OE13) 2. RTOS and System Programming (2204OE14) 3. Computer Vision (2204OE15) 4. Robotics (2204OE16)
EEE	2202OE01: Renewable Energy Sources 2202OE02: Elements of Electrical Engineering 2202OE03: Basic Control System Engineering 2202OE04: Electrical Power Utilization & Illumination 2	202OE05: Energy Storage Systems 2202OE06:Utilization of Solar Energy 2202OE07: Modern Control Theory 2202OE08: Smart Grid Technologies	2202OE09:Principles of Power System Engineering 2202OE10:Reliability Engineering 2202OE11: Digital Control Systems 2202OE12: Battery Management Systems	2202OE13 Energy Management and Conservation 2202OE14 Power Quality 2202OE15 Advanced control systems 2202OE16 Distributed Energy Systems

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INSTITUTE VISION

- ❖ Visualizing a great future for the intelligentsia by imparting state-of the art Technologies in the field of Engineering and Technology for the bright future and prosperity of the students.
- ❖ To offer world class training to the promising Engineers.

INSTITUTE MISSION

- ❖ To nurture high level of Decency, Dignity and Discipline in women to attain high intellectual abilities.
- ❖ To produce employable students at National and International levels by effective training programmes.
- ❖ To create pleasant academic environment for generating high level learning attitudes.

DEPARTMENT VISION

- ❖ To empower women in the field of Information Technology through quality education, nurturing them into globally competent professionals with strong technical skills, ethical values, and leadership qualities, ready to meet the challenges of the evolving IT industry.

DEPARTMENT MISSION

- ❖ **M1:** To offer a high quality education that integrates cutting-edge technologies, nurtures creativity and analytical skills, and shapes ethical, globally competitive professionals.
- ❖ **M2:** To develop leadership qualities and enhance employability through hands-on training, industry collaboration, and research in emerging technologies, preparing women to address the dynamic challenges of the IT sector.
- ❖ **M3:** To impart technological education with a strong emphasis on dignity, decency and discipline to develop professional engineers who are both technically competent and socially responsible.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**PEO 1: Technical Proficiency and Innovation**

Graduates will develop a solid foundation in Information Technology, employing modern tools and innovative methodologies to effectively solve industry challenges.

PEO 2: Leadership and Professional Excellence

Graduates will demonstrate leadership abilities, effective teamwork, and ethical practices, enabling them to achieve career success and contribute to the global IT sector.

PEO 3: Lifelong Learning and Societal Impact

Graduates will engage in continuous learning, adapt to technological advancements, and apply their skills to positively influence society, with a special emphasis on empowering students in the field of Information Technology.

PROGRAM OUTCOMES (PO's)

PO 1: Engineering knowledge- Apply mathematics, logical, statistical, and scientific principles, emphasizing computing and information processing.

PO 2: Problem Analysis- Identify and analyze the user needs and take them in to account for Selection, Creation, Evaluation and Administration of Computer-based systems.

PO 3: Design/Development of Solutions- Understand software engineering and Testing principles and apply them to design, develop, implement and deploy with extensive security features.

PO 4: Conduct Investigations of Complex Problems- Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO 5: Modern Tool Usage- Apply information technology principles and practices to a variety of problems, with the understanding of social, professional and ethical issues.

PO 6: The engineer and society-ability to understanding of professional, cultural and social responsibilities.

PO 7: Environment and sustainability- Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics- Apply ethical principles, responsibility and norms of the engineering practice.

PO 9: Individual and team work-An ability to function on multi-disciplinary teams.

PO 10: Communication- Ability to communicate and present effectively

PO 11: Project Management and Finance-Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.

PO 12:Life-long learning- Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OBJECTIVES(PSO's)**PSO 1: Problem Solving and Application Development**

Graduates will be able to analyze real-world problems and design efficient IT solutions, applying programming, database management, and software development methodologies.

PSO 2: Modern Tool Usage and Technological Adaptability

Graduates will be proficient in using modern IT tools and technologies, while continuously adapting to emerging trends to enhance system development and deployment.

PSO 3: Professional Ethics and Societal Contributions

Graduates will uphold professional ethics, effectively contribute to team-based projects, and apply IT solutions to address societal needs, with a focus on women's empowerment and community development.

I B.TECH SYLLABUS (IT)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400BS01) LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS

B.Tech. I Year I Sem

L T PC

3 1 0 4

Course Objectives: To learn

- Types of Matrices and their properties, concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and Eigenvectors and to reduce the quadratic form to canonical form.
- Geometrical approach to the mean value theorems, their application to the mathematical problems and Evaluation of improper integrals using Beta and Gamma functions
- Partial differentiation, concept of total derivative, finding maxima and minima of function of two and three variables.
- Evaluation of multiple integrals and their applications.

Course Outcomes:

At the end of course student will-

- Apply concepts of matrices to solve systems of linear equations and find the rank and inverse of matrices using various methods.
- Analyze eigenvalues, eigenvectors, and quadratic forms to diagonalizable matrices and solve related problems using transformations.
- Solve first-order ordinary differential equations (ODEs) using appropriate methods and apply them to real-life problems such as cooling, growth, and decay.
- Solve second-order linear differential equations using methods such as variation of parameters and analyze solutions for different types of non-homogeneous terms.
- Apply multivariable calculus to solve problems involving limits, continuity, partial differentiation, and maxima-minima of multivariable functions.
- Utilize Jacobians and Lagrange multipliers to analyze functional dependence, independence, and optimization problems.

UNIT-I:

Matrices: Types of Matrices, Symmetric; Skew-symmetric; Hermitian; Skew- Hermitian; Orthogonal matrices; Unitary Matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; Solving system of Homogeneous and Non-Homogeneous equations. Gauss elimination method; Gauss Seidel Iteration Method.

UNIT-II:

Eigen values and Eigen vectors: Eigen values and Eigenvectors and their properties; Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); Finding inverse and power of a matrix by Cayley-Hamilton Theorem; Linear Transformation and Orthogonal

Transformation; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to Canonical form by Orthogonal Transformation.

UNIT-III:

Differential Calculus: Rolle's mean value theorem (without proof), Lagrange's Mean value theorem (without proof) with their Geometrical Interpretation, Cauchy's Mean value Theorem (without proof). Taylor's series, Maclaurin's series. Definition of Improper Integral; Definition of Beta and Gamma functions, properties, relation between them and evaluation of integrals using Beta and Gamma functions.

UNIT-IV:

Multivariable Calculus: Definitions of Limit and Continuity. Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V:

Multiple Integrals: Evaluation of Double Integrals (Cartesian and Polar coordinates); Change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals. Areas (by double integrals) and Volumes (by double integrals and triple integrals).

TEXTBOOKS:

B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publishers, 4th Edition, 2014.

REFERENCES:

Michael Greenberg, Advanced Engineering Mathematics, Pearson Education, 2nd Edition, 1998.

Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 9th Edition, 2006.

Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2017.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405ES01): PROGRAMMING FOR PROBLEM SOLVING

B.Tech. I Year I Sem**L T PC****3 0 0 3****Course Objectives:**

- To understand the various steps in program development.
- To learn the syntax and semantics of C programming and Python.
- Understand Lists, Dictionaries and Tuple in Python.
- To learn the usage of structured programming approach in C Programming.
- Implement Object Oriented Programming concepts in Python

Course Outcomes:

At the end of course student will-

- To write algorithms and to draw flowcharts for solving problems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries.
- To code and test a given logic in C programming language.
- To decompose a problem into functions and to develop modular reusable code.
- To use arrays, pointers, strings and structures to write C programs, Demonstrate proficiency in handling Strings and File Systems.
- Interpret the concepts of Object-Oriented Programming as used in Python.

UNIT I:

Introduction: Operating System, Compilers, Creating, Compiling and Executing a Program, Representation of Algorithm, Flowchart/Pseudo Code with examples.

Introduction to C Programming: Structure of a C program, Identifiers, Variables (with data types and space requirements), Operators, Precedence and Expression evaluation, Type conversion.

UNIT II:

Conditional Branching and Loops: Writing and Evaluation of Conditionals with If, If-Else, else- if ladder Switch-Case, goto, Iteration with For, While, Do While Loops

Arrays: One-Two-Dimensional Arrays, Creating, Accessing and Manipulating Elements of it

Strings: Introduction To Strings, Handling Strings as Array of Characters, Basic String Functions available in C (Strlen, Strcat, Strcpy, Strstr Etc.), Arrays of Strings.

UNIT – III:

Functions: Declaring a function, Parameters and return type of a function, passing parameters to functions, Recursive Functions.

Structures: Defining structures, initializing structures, unions.

Pointers: Idea of pointers, Defining pointers, Pointer to Pointer, Dynamic Memory Management functions (DMA)

File Handling in C: 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.

UNIT – IV:

Introduction to Python Programming: Modes: Interactive Mode, Scripting Mode, Identifiers, Keywords, Variables, Comments, Lines and Indentations, Quotations, Assigning Values to Variables, Data Types in Python, Mutable Vs Immutable, Fundamental Data Types: int, float, complex, bool, str, Advanced Data Types (List, Tuple, Dictionary, set, etc..).

Decision Making Statements: if Statement, if-else Statement, elif Statement. Looping Statements: For and While loops, Nested loops, Using else Statement with loops, Control Statements: break Statement, continue Statement, Pass Statement.

Python Slicing & Indexing: Forward Direction Slicing with +ve Step, Backward Direction Slicing with -ve Step, Built-in String Functions.

UNIT – V:

Python Functions: Creating a Function, Function Calling, Parameters in Function, Types of Arguments, Scope of Variables, Python Built-in Functions. Python Lambda Functions.

Python File Handling: Opening a File, Reading the File, Read Lines of the File, Writing the File, creating a New File Using with Statement with Files, File Pointer Position, Modifying File Position Renaming the File & Removing the File, Writing Python Output to the Files, File Related Methods.

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B. A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2. Programming in C. P. Dey and M Ghosh, Second Edition, Oxford University Press.

3. Core Python Programming, Wesley J. Chun, Second Edition, Pearson

REFERENCE BOOKS:

1. The C Programming Language, B.W. Kernighan and Dennis M. Ritchie, Second Edition, Pearson education.
2. Programming with C, B. Gottfried, 3rd edition, Schaum's outlines, McGraw Hill Education (India) Pvt Ltd.
3. Programming Languages, A.B. Tucker, R.E. Noonan, TMH.
4. Programming Languages, K. C. Loudon and K A Lambert., 3rd edition, Cengage Learning.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400BS06): ENGINEERING CHEMISTRY

B.TECH I YEAR I SEMESTER**L T P C****3 0 0 3****COURSE OBJECTIVES: To learn**

- To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
- To impart the basic knowledge of atomic, molecular and electronic modifications which makes the student to understand the technology based on them.
- To acquire the knowledge of electrochemistry, corrosion and water treatment which are essential for the Engineers and in industry.
- To acquire the skills pertaining to spectroscopy and to apply them for medical and other fields.
- To impart the knowledge of stereochemistry and synthetic aspects useful for understanding reaction pathways

COURSE OUTCOMES:

The basic concepts included in this course will help the student to gain:

- Understand atomic and molecular orbitals, LCAO, molecular orbital energy diagrams of molecules (N_2 , O_2 , F_2), and π molecular orbitals. Analyze crystal field theory (CFT) and its application to transition metal ions
- Apply principles of water hardness, estimation of hardness, and methods of water treatment. Analyze the effects of hardness and corrosion in boiler systems and understand external treatment methods like ion exchange and reverse osmosis.
- Understand electrochemical cells, Nernst equation, and the applications of electrode potentials. Analyze corrosion types and control methods. Apply electrochemical concepts to batteries, sensors, and corrosion protection.
- Analyze 3D structures, isomerism, chirality, and reaction mechanisms. Apply knowledge to synthesize drugs like Paracetamol and Aspirin and understand oxidation/reduction reactions.
- Understand the principles and applications of UV-Visible, IR, and NMR spectroscopy. Analyze spectroscopic data for organic compounds and apply the techniques to identify functional groups.
- Apply the principles of organic chemistry to pharmaceutical applications such as drug synthesis. Create methods for analyzing drug molecules like Paracetamol and Aspirin using spectroscopic techniques.

UNIT - I:

Molecular structure and Theories of Bonding: Atomic and Molecular orbital's. Linear Combination of Atomic Orbital's (LCAO), molecular orbital's of diatomic molecules, molecular orbital energy level diagrams of N₂, O₂ and F₂ molecules. π molecular orbital's of butadiene and benzene.

Crystal Field Theory (CFT): Salient Features of CFT – Crystal Field Splitting of transition metal ion d- orbital's in Tetrahedral, Octahedral and square planar geometries. Band structure of solids and effect of doping on conductance.

UNIT - II:

Water and its treatment: Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complexometric method. Potable water and its specifications. Boiler troubles: Scales and Sludge's, Priming and Foaming, Caustic Embrittlement. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization. Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis. Numerical problems.

UNIT - III:

Electrochemistry and corrosion: Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – Calomel, Quinhydrone and Glass electrode. Nernst equation, Determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Numerical problems. Potentiometric titrations.

Electrochemical sensors: Potentiometric Sensors and voltametric sensors. Examples: analysis of Glucose and urea.

Batteries – Primary: Lithium cell, secondary batteries : Lead – acid storage battery and Lithium ion battery, Fuel cells: H₂-O₂ Fuel cell, CH₃OH-O₂ Fuel cell.

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 and impressed current cathodic methods. Surface coatings – metallic coatings – methods of application: Galvanising , Tinning , Metal Cladding, Electro-deposition, Electroless plating of Nickel.

UNIT - IV:

Stereochemistry, Reaction Mechanism and synthesis of drug molecules: Introduction to representation of 3-dimensional structures, Structural and stereoisomers, configurations,

symmetry and chirality. Enantiomers, diastereomers, optical activity and Absolute configuration. Conformation analysis of n- butane.

Substitution reactions: Nucleophilic substitution reactions: Mechanism of SN^1 , SN^2 reactions.

Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and anti Markownikoff's additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydro halogenation of alkylhalides, Saytzeff rule. Oxidation reactions: Oxidation of alcohols using $KMnO_4$ and chromic acid. Reduction reactions: Reduction of carbonyl compounds using $LiAlH_4$ & $NaBH_4$. Hydroboration of olefins. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

UNIT – V

Spectroscopic techniques and applications: Principles of electronic spectroscopy: Beer Lamberts law, Numerical problems, types of electronic excitations , applications of UV –Visible spectroscopy. IR Spectroscopy: Principle, Modes of vibrations, selection rules, Force Constant ,Some common organic functional groups Wave number regions (C-H, NH_2 , OH, $-COOH$, $C=O$, $C\equiv N$, $C=C$, $C\equiv C$), Applications of IR Spectroscopy, 1H -NMR(NMR Spectroscopy), Principles of NMR spectroscopy, chemical shift, Chemical shifts of some organic protons , Introduction to Magnetic resonance imaging.

Suggested Text Books:

1. Physical Chemistry, by P.W. Atkins
2. Engineering Chemistry by P.C.Jain&M.Jain; DhanpatRai Publishing Company (P)Ltd., New Delhi.
3. Fundamentals of Molecular Spectroscopy, by C.N. Banwell
4. Organic Chemistry: Structure and Function by K.P.C. Volhardt and N.E.Schore, 5thEdition.
5. University Chemistry, by B.M. Mahan, Pearson IV Edition.
6. Engineering Chemistry (NPTEL Web-book), by B.L. Tembe, Kamaluddin and M.S.Krishnan.ll

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN**2403ES01: COMPUTER AIDED ENGINEERING GRAPHICS****B.TECH I YEAR I SEM****L T P C****1 0 4 3****Course Objectives:**

1. To enable the students with various concepts like Dimensioning, Conventions and standards related to working drawing in order to become professionally efficient and to introduce fundamental concepts of curves used in engineering,
2. Students are capable to understand the Orthographic Projections of Points and Lines and are able to improve their visualization skills so that they can apply these skills in developing the new products.
3. Understands and becomes efficient in applying the concept of Orthographic Projections of Points, Lines and Planes in industrial applications
4. Can employ freehand 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.
5. Analyze a drawing and can efficiently communicate ideas graphically and Draw the 3D views using CAD.

Course Outcomes:

At the end of course student will-

1. Understand the interface, commands, and tools of AutoCAD software. Apply principles of engineering drawing, conventions, and construction of engineering curves such as ellipses, parabolas, and cycloidal curves.
2. Understand the principles of orthographic projection. Apply conventions and techniques to project points and straight lines in different positions. Analyze lines inclined to planes for accurate representation
3. Apply the principles of projection to represent planes in different orientations. Analyze the relative inclinations of planes to accurately evaluate projections.
4. Apply projection principles to visualize regular solids in different orientations. Analyze and evaluate projections of solids, including prisms, pyramids, cylinders, and cones.
5. Apply isometric projection principles to create isometric views and scales. Convert between isometric and orthographic views for better visualization of 3D objects.
6. Apply solid modeling techniques in AutoCAD to create simple 3D models relevant to engineering domains.

UNIT-I:**Introduction to AutoCAD Software:**

The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line, The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.

Introduction to Engineering Drawing:

Principles of Engineering drawing and their significance, Conventions, Drawing Instruments

Engineering Curves: Construction of Ellipse, Parabola and Hyperbola – General and Special methods; Cycloidal curves- Epicycloids and Hypocycloids.

UNIT-II:

Orthographic Projections, Projections of Points & Straight Lines: Principles of Orthographic Projections – Conventions; Projections of Points in all positions; Projections of lines Parallel to one Plane and Perpendicular to other Plane and Vice-versa - Inclined to one Plane and Parallel to other Plane and Vice-versa–Surface inclined to both the Planes.

UNIT-III:

Projections of Planes: Projections of Planes- Surface Parallel to one Plane and Perpendicular to other Plane and Vice-versa – Surface Inclined to one Plane and Parallel to other Plane and Vice-versa - Surface Inclined to both the Planes.

UNIT-IV:

Projections of Regular Solids: Projections of Regular Solids-Parallel to one Plane and Perpendicular to other Plane and vice-versa- inclined to one Plane and Parallel to other Plane and vice-versa- Inclined to both the Planes– Prisms, Pyramids, Cylinder and Cone.

UNIT-V:

Isometric Projections: Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and Compound Solids Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions

Introduction to Solid Modeling: Creation of simple solid models relevant to the domain.

TEXT BOOKS

1. Engineering Drawing, N.D. Bhatt – N.D. Bhatt & V.M Panchal, 48th Edition, 2005 Charotar Publishing House, and Gujarat.
2. "Computer Aided Engineering Drawing" by Dr. M H Annaiah, Dr C N Chandrappa and Dr B Sudheer Premkumar Fifth edition, New Age International Publishers.
3. Engineering Drawing by K.VenuGopal & V.Prabu Raja New Age Publications.

REFERENCES

1. Engineering drawing – P.J. Shah .S.Chand Publishers.
2. Engineering Drawing / Basant Agarwal and McAgarwal / McGraw Hill
3. Engineering Drawing- Johle/Tata Macgraw Hill Book Publisher.
4. Computer Aided Engineering Drawing – S. Trymbaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400HS01) ENGLISH FOR SKILL ENHANCEMENT**B.Tech. I Year II Sem****L T P C**
2 0 0 2**INTRODUCTION**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students. In English classes, the focus should be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, the teachers should use the prescribed text for detailed study. The students should be encouraged to read the texts leading to reading comprehension and different passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc. The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures.

Course Objectives:

The course will help to

- Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
- Enhance competencies in writing essays and gist of the passage in words.
- Equip students to study academic subjects more effectively and critically, using the theoretical and practical components of English syllabus.
- Develop study skills and communication skills in formal and informal situations.

Course Outcomes:

Students should be able to

- Use English Language effectively in spoken and written forms.
- Comprehend the given texts and respond appropriately.
- Communicate confidently in various contexts and different cultures.
- Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
- The students will be able to understand meaning of words, phrases and sentences in context.
- Understand and express simple narratives, descriptions and day to day conversations.

UNIT –I

‘The Raman Effect’ from the prescribed textbook ‘English for Engineers’ published by Cambridge University Press.

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes

and Suffixes. Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions. Reading: Reading and its Importance- Techniques for Effective Reading.

Basic Writing Skills: 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

‘Ancient Architecture in India’ from the prescribed textbook ‘English for Engineers’ published by Cambridge University Press.

Vocabulary: Homonyms, Homophones and Homographs. Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives- Words from Foreign Languages and their Use in English. Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject- verb Agreement.

Reading: Improving Comprehension Skills – Techniques for Good Comprehension

Writing: Format of a Formal Letter-Writing Formal Letters - E.g., Letter of Complaint, Letter of Requisition, Job Application with Resume.

UNIT –III

‘Blue Jeans’ from the prescribed textbook ‘English for Engineers’ published by Cambridge University Press.

Vocabulary: Synonyms and Antonyms

Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses and Question Tags

Reading: Sub-skills of Reading- Skimming and Scanning

Writing: Nature and Style of Sensible Writing- Defining- Describing Objects, Places and Events – Classifying- Providing Examples or Evidence, E-mail writing and practices.

UNIT –IV

‘What Should You Be Eating’ from the prescribed textbook ‘English for Engineers’ published by Cambridge University Press.

Vocabulary: Idioms and phrases, Phrasal Verbs and One word substitutions

Grammar: Active voice and Passive voice- Redundancies and Clichés in Oral and Written Communication.

Reading: Comprehension- Intensive Reading and Extensive Reading

Writing: Writing Practices--Writing Introduction and Conclusion - Essay Writing-Précis Writing.

UNIT –V

‘How a Chinese Billionaire Built Her Fortune’ from the prescribed textbook ‘English for Engineers’ published by Cambridge University Press.

Vocabulary: Standard Abbreviations in English and Technical Vocabulary and their usage Grammar: Reported speech and Common Errors in English

Reading: Reading Comprehension-Exercises for Practice

Writing: Report writing - Introduction – Characteristics of a Report –

Categories of Reports, Formats- Structure of Reports (Manuscript Format) -
Types of Reports - Writing a Report.

REFERENCES:

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
5. Hamp-Lyons, L. (2006). Study Writing. Cambridge University Press.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2400BS62: ENGINEERING CHEMISTRY LAB

B.TECH I YEAR II SEMESTER

L T P C
0 0 2 1

Course Objectives:

The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

- Estimation of hardness and chloride content in water to check its suitability for drinking purpose.
- To determine the rate constant of reactions from concentrations as a function of time.
- The measurement of physical properties like adsorption and viscosity.
- To synthesize the drug molecules and check the purity of organic molecules by thin layer chromatographic (TLC) technique.

Course Outcomes:

At the end of course student will-

- Ability to perform experiments illustrating the principles of chemistry relevant to the study of science and engineering.
- To record the amount of hardness and chloride content in water and interpret the significance of its presence in water.
- Understand the kinetics of a reaction from a change in concentration of reactants or products as a function of time.
- To evaluate and report the amount of analyte by using instruments like conductimetry, potentiometry and pH metrology.
- To analyze and predict the significance of properties like adsorption, viscosity and surface tension.
- To demonstrate the technique of Thin Layer Chromatography (TLC) and synthesis of drug molecules widely used in industry.

List of Experiments

1. Determination of total hardness of water by complexometric method using EDTA
2. Determination of chloride content of water by Argentometry
3. Estimation of an HCl by Conductometric titrations.
4. Estimation of Acetic acid by Conductometric titrations
5. Estimation of HCl by Potentiometric titrations
6. Estimation of Fe^{2+} by Potentiometry using KMnO_4
7. Determination of rate constant of acid catalysed hydrolysis of methyl acetate
8. Synthesis of Aspirin and Paracetamol
9. Thin layer chromatography calculation of R_f values. e.g. ortho and para nitro phenols
10. Determination of acid value of coconut oil

11. Verification of freundlich adsorption isotherm-adsorption of acetic acid on charcoal
12. Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.
13. Determination of partition coefficient of acetic acid between n-butanol and water.
14. Determination of surface tension of a give liquid using stalagmometer.

References

1. Senior practical physical chemistry, B.D. Khosla, A.Gulati and V.Garg (R. Chand &Co., Delhi)
2. An introduction to practical chemistry, K.K. Sharma and D. S.Sharma (Vikaspublishing, N. Delhi)
3. Vogel's text book of practical organic chemistry 5th edition
4. Text book on Experiments and calculations in Engineering chemistry – S.S. Dara.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400HS61)ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B.Tech. I Year I Sem**L T PC**
0 0 2 1

The Language Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

Course Objectives:

- To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
- To sensitize students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency of students in spoken English and neutralize their mother tongue influence
- To train students to use language appropriately for public speaking and interviews
- To foster better understanding of nuances of English language through audio- visual experience and group activities
- To inculcate Neutralization of accent for intelligibility
- To enhance students' speaking skills with clarity and confidence which in turn enhances their employability skills

Course outcome:

- Understand the nuances of English language through audio- visual experience and group activities.
- Neutralize their accent for intelligibility
- Speak with clarity and confidence which in turn enhances their employability skills
- Acquire basic proficiency in LSRW skills, the main pillars of communication
- Achieve expertise in pronunciation, accent and voice modulation
- Students will be able to strengthen their individual and collaborative work strategies

English Language and Communication Skills Lab (ELCS) shall have two parts:

- a.Computer Assisted Language Learning (CALL)Lab
- b.Interactive Communication Skills (ICS)Lab

Course Outcomes:

At the end of course student will be able to -

- Understand the nuances of English language through audio- visual experience and group

activities.

- Neutralize their accent for intelligibility
- Speak with clarity and confidence which in turn enhances their employability skills
- Acquire basic proficiency in LSRW skills, the main pillars of communication
- Achieve expertise in pronunciation, accent and voice modulation
- Students will be able to strengthen their individual and collaborative work strategies

Listening Skills Objectives

1.To enable students develop their listening skills so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation

2.To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills Objectives

1.To involve students in speaking activities in various contexts

2.To enable students express themselves fluently and appropriately in social and professional contexts

- Oral practice: Just A Minute (JAM) Sessions
- Describing objects/situations/people
- Role play – Individual/Group activities
- Group Discussion – Group activities

The following course content is prescribed for the English Language and Communication Skills Lab based on Unit-6 of AICTE Model Curriculum 2018 for B.Tech First Year English. As the syllabus is very limited, it is required to prepare teaching/learning materials by the teachers collectively in the form of handouts based on the needs of the students in their respective colleges for effective teaching/learning and timesaving in the Lab)

Exercise – I CALL Lab:

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening.

Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants.

ICS Lab:

Understand: Communication at Work Place- Spoken vs. Written language.

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 and Rhythm– Weak Forms and Strong Forms in Context.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

ICS Lab:

Understand: Features of Good Conversation – Non-verbal Communication.

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

Exercise - III CALL Lab:

Understand: Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI). Practice: Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.

ICS Lab:

Understand:Telephonic Etiquette, How to make Formal Presentations.

Practice:Formal Telephone conversation and Formal Presentations.

Exercise – IV CALL Lab:

Understand: Consonant Clusters, Plural and Past tense Markers

Practice: Words often Misspelled – Confused/ Misused.

ICS Lab:

Understand: Public Speaking – Exposure to Structured Talks. Practice:

Making a Short Speech – Extempore.

Exercise – V CALL Lab:

Understand: Listening for General and Specific Details.

Practice: Listening Comprehension Tests.

ICS Lab:

Understand: Group Discussion and Interview Skills.

Practice: Case study Group Discussions and Mock Interviews.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405ES61) PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year I Sem

LTPC

0 0 5 2.5

Course Objectives: The students will learn the following:

- To develop programs to solve basic problems by understanding basic concepts in C like operators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions, arrays etc.
- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.

Course Outcomes: The candidate is expected to be able to:

- formulate the algorithms for simple problems
- translate given algorithms to a working and correct program
- represent and manipulate data with arrays, strings and structures
- Student able to understand the basic concepts scripting and the contributions of scripting language
- Ability to explore python especially the object-oriented concepts, and the built in objects of Python.
- Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations

WEEK 1:

1. Write a simple program that prints the results of all the operators available in C (including pre/ post increment, bitwise and/or/not, etc.). Read required operand values from standard input
2. Write a program for find the max and min from the three numbers.

WEEK 2:

1. Write program that declares Class awarded for a given percentage of marks, where mark
<40%= Failed, 40% to <60% = Second class, 60% to <70%=First class, >= 70% = Distinction. Read percentage from standard input.
2. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)
3. Write a program that prints a multiplication table for a given number and the number of

rows in the table

For example, for a number 5 and rows = 3, the output should be: $5 \times 1 = 5$

$5 \times 2 = 10$

$5 \times 3 = 15$

WEEK 3:

1. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
4. Write a C program to read in two numbers, x and n, and then compute the sum of this Geometric progression: $1+x+x^2+x^3+\dots+x^n$. For example: if n is 3 and x is 5, then the program computes $1+5+25+125$.

WEEK 4:

1. Write a C program to find the minimum, maximum and average in an array of integers
2. Write a C program that uses functions to perform the following:
 - a. Addition of Two Matrices
 - b. Multiplication of Two Matrices
3. Write C programs that use both recursive and non-recursive functions
 - a. To find the factorial of a given integer.
 - b. To find the GCD (greatest common divisor) of two given integers.
4. Write a program through pointer variable to sum of n elements from array.

WEEK 5:

1. Write a C program to determine if the given string is a palindrome or not (Spelled same in both directions with or without a meaning like madam, civic, noon, abcba, etc.)
2. Write a C program to insert a sub-string in to a given main string from a given position.
3. Write a C program to count the lines, words and characters in a given text.

WEEK 6:

1. Write a C program to store information of 5 students using structures.
2. Write a C program to access members of union?
3. Write a C program to display the contents of a file to standard output device.
4. Write a C program which copies one file to another, replacing all lowercase characters with their uppercase equivalents.

WEEK 7:

1. Python program to print "Hello Python"
2. Write a program that computes and prints the result of $512 - 282 / 47 \cdot 48 +$

- 5 . It is roughly .1017
3. Ask the user to enter a number. Print out the square of the number but use the sep optional argument to print it out in a full sentence that ends in a period. Sample output is shown below. Enter a number: 5
The square of 5 is 25.
4. Ask the user to enter a number x. Use the sep optional argument to print out x, 2x, 3x, 4x, and 5x, each separated by three dashes, like below.
Enter a number: 7
7---14---21---28---35

WEEK 8:

1. Write a program that asks the user to enter a length in centimetres. If the user enters a negative length, the program should tell the user that the entry is invalid. Otherwise, the program should convert the length to inches and print out the result. There are 2.54 centimetres in an inch.
2. Write a program that asks the user how many credits they have taken. If they have taken 23 or less, print that the student is a freshman. If they have taken between 24 and 53, print that they are a sophomore. The range for juniors is 54 to 83, and for seniors it is 84 and over.
3. A year is a leap year if it is divisible by 4, except that years divisible by 100 are not leap years unless they are also divisible by 400. Write a program that asks the user for a year and prints out whether it is a leap year or not
4. A number is called a perfect number if it is equal to the sum of all of its divisors, not including the number itself. For instance, 6 is a perfect number because the divisors of 6 are 1, 2, 3, 6 and $6 = 1 + 2 + 3$.

WEEK 9:

1. Write a program that computes the factorial of a number. The factorial, $n!$, of a number n is the product of all the integers between 1 and n , including n .
For Example: $5! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 = 120$
2. The Fibonacci numbers are the sequence below, where the first two numbers are 1, and each number thereafter is the sum of the two preceding numbers. Write a program that asks the user how many Fibonacci numbers to print and then prints that many.
1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89 . . .
3. Write a program that asks the user to enter a string. The program should then print the following:
 - (a) The total number of characters in the string
 - (b) The string repeated 10 times
 - (c) The first character of the string (remember that string indices start at 0)
 - (d) The first three characters of the string
 - (e) The last three characters of the string

- (f) The seventh character of the string if the string is long enough and a message otherwise
- (g) The string with its first and last characters removed
- (h) The string in all caps
- (i) The string with every a replaced with an e
- (j) The string with every letter replaced by a space.

WEEK 10:

1. Write a program that asks the user to enter a string. The program should create a new string called new string from the user's string such that the second character is changed to an asterisk and three exclamation points are attached to the end of the string. Finally, print new string. Typical output is shown below:

Enter your
string:
Qbert
Q*ert!!!

2. A website requires the users to input username and password to register. Write a program to check the validity of password input by users. Following are the criteria for checking the password:

1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
3. At least 1 letter between [A-Z]
4. At least 1 character from [\$#@]
5. Minimum length of transaction password: 6
6. Maximum length of transaction password: 12

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example If the following passwords are given as input to the program: Then, the output of the program should be:

ABd1234@1

3. Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized

Suppose the following input is supplied to the

program: Hello world

Practice makes

perfect Then,

the output

should be:

HELLO

WORLD

PRACTICE MAKES PERFECT

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC02) FRENCH LANGUAGE**B.Tech. I Year I Sem****LTPC****2 0 0 0****Introduction:**

In view of the growing importance of foreign languages as a communication tool in some countries of the world, French has been identified as one of the most popular languages after English. As a result, French program is introduced to develop the linguistic and communicative skills of engineering students and to familiarize them to the French communication skills. This course focuses on basic oral skills.

Course Objectives:

- To inculcate the basic knowledge of the French language.
- To hone the basic sentence constructions in day to day expressions for communication in their vocation.

Course Outcomes:

At the end of course student will be able to -

- Students will be able to communicate in French at A1 level.
- Sentence construction in day to day expressions.
- Communicate confidently in various contexts and different cultures where French is an official language.
- The students will be able to understand meaning of words, phrases and sentences in context.
- Acquire basic proficiency in including reading and listening.
- Understand and express simple narratives, descriptions and day to day conversations.

UNIT - I:

Speaking: Introduction to the French language and culture – Salutations - French alphabet - Introducing people

Writing: Understand and fill out a form

Grammar: The verbs “to be ” and “to have ” in the present tense of the indicative Vocabulary:

The numbers from 1 to 20 - Professions - Nationalities

UNIT - II:

Speaking: Talk about one's family – description of a person - express his tastes and preferences
-express possession - express negation Writing: Write and understand a short message
Grammar: Nouns (gender and number) - Articles - The –er verbs in the present – Possessive
adjectives - Qualifying adjectives
Vocabulary: The family – Clothes - Colors - The numbers from 1 to 100 - The classroom

UNIT - III

Speaking: Talk about your daily activities - be in time - ask and indicate the date and time –talk
about sports and recreation - express the frequency Writing: A letter to a friend
Grammar - The expression of time – Their verbs in the present - The verbs do, go, take, come,
-Adverbs - Reflexive verbs
Vocabulary - The days and months of the year-The sports -Hobbies

UNIT - IV

Speaking: Express the quantity - ask and give the price - express the need, the will and the
capacity - compare (adjective) - speak at the restaurant / in the shops
Writing: A dialogue between a vendor and a customer at the market
Grammar: Verbs “to want”, “to can” - Express capacity / possibility - Express will / desire –the
future tense
Vocabulary: The food – Meals - Fruits and vegetables – The parts of the body

UNIT - V

Speaking: Express the prohibition and the obligation - describe an apartment - talk about the
weather / ask the weather - ask the opinion - give your opinion - express your agreement or
disagreement
Writing: Descriptions
Grammar: Demonstrative adjectives -Prepositions - The verb 'must' to indicate obligation and
necessity in the present
Vocabulary: Seasons – Holidays - The city – Furniture
NOTE: The students are exposed to simple listening and reading activities.

REFERENCE BOOKS

1. Apprenons le Français 1& 2, New SaraswatiHouse,2015
2. A propos, A1, LangersInternational,2010
3. Easy French Step-by-step by Myrna Bell Rochester
4. Ultimate French Beginner-Intermediate (Coursebook) ByLividLanguage
5. À L'Aventure: An Introduction to French Language and Francophone Cultures by
EvelyneCharvier-Berman, AnneC.Cummings.

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN**2400BS02: NUMERICAL TECHNIQUES & VECTOR CALCULUS****B.TECH IYEAR IISEMESTER****LTPC**

3104

Course Objectives: To learn

- Geometrical approach to the mean value theorems, their application to the mathematical problems and Evaluation of improper integrals using Beta and Gamma functions.
- Evaluation of multiple integrals and their applications.
- The physical quantities involved in engineering field related to vector valued functions and their applications to line, surface and volume integrals.
- A periodic function by Fourier series and a non-periodic function by Fourier transform and properties.
- Properties of Laplace transforms, solving ordinary differential equations using Laplace transforms techniques. Also, Z- transform of a sequence and properties.

Course Outcomes: After learning the contents of this course, the student must be able to

- Solve the applications on mean value theorems and evaluate the improper integrals using Beta and Gamma functions:
- Evaluate the multiple integrals and apply the concept to find areas, volumes.
- Find the directional derivatives, Irrotational and Solenoidal functions and angle between the surfaces. Evaluate the line, surface and volume integrals and converting them from one to another.
- Express any periodic function in terms of Sines and Cosines and express a non- periodic function as integral transform.
- Use the Laplace transform techniques for solving ODE's and sequence as Z – transforms.
- Use z – transforms for solving difference equations.

UNIT-I:

Differential Calculus: Rolle's theorem (without proof), Lagrange's Mean value theorem (without proof) with their Geometrical Interpretation, Cauchy's Mean value Theorem (without proof). Definition of Improper Integral; Definition of Beta and Gamma functions, properties, relation between them.

UNIT-II:

Multiple Integrals: Evaluation of Double Integrals (Cartesian); Change of order of integration (only Cartesian form); Evaluation of Triple Integrals. Areas (by double integrals) and Volumes (by double integrals and triple integrals).

UNIT-III:

Vector Differentiation: Vector point functions and Scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Scalar potential functions.

Vector Integration: Line and Surface integrals

UNIT– IV:

Fourier series: Introduction, Fourier series definition, Dirichlet's conditions, Even and odd functions. **Fourier Transforms:** Fourier integral theorem (without proof), Fourier sine and cosine integrals, sine and cosine transforms, properties, inverse Fourier transforms.

UNIT– V:

Laplace Transforms: Definition of Laplace transform, Laplace transform of standard functions, and properties Definition of Inverse Laplace transform, Inverse Laplace transforms of standard functions Convolution theorem, Solution of ordinary differential equations by Laplace transforms.

Z- transforms: Z- transforms inverse z-transforms, properties .convolution theorem, solution of difference equation by z-transforms.

TEXTBOOKS:

1. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th Edition, 2017.
2. R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition, 2016.
3. M. K Jain, S.R. K Iyengar, R.K Jain, Numerical Methods for Scientific and Engineering Computation, New age International publishers.

REFERENCE BOOKS:

- Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 9th Edition, 2013.
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 38th Reprint, 2022.
- G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson, 9th Edition, Reprint, 2002.
- N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008

MALLAREDDY ENGINEERING COLLEGE FOR WOMEN**2405ES02: DATA STRUCTURES AND ALGORITHMS****B.TECH IYEAR II SEMESTER****LTPC****3003****Course Objectives:**

- Impart the basic concepts of data structures and algorithms.
- Help students understand various searching and sorting techniques.
- Introduce fundamental data structures such as stacks, queues, lists, trees, and graphs.
- Enable students to design and write algorithms to solve problems using fundamental data structures.

Course Outcome:

At the end of course student will be able to-

- Present foundational data structures along with their operations (insertion, deletion, traversal) and assess algorithmic efficiency through asymptotic notations, computation complexity and justify the correctness
- Analyze searching techniques, including Linear Search and Binary Search, and determine their computational complexity.
- Analyze stack and queue structures and apply them in expression conversion and evaluation problems, assessing algorithm complexity, determine the time and computation complexity.
- Analyze proficiency with linked list operations (singly, doubly, and circular linked lists) by creating and manipulating lists, stacks, and queues, and analyze the complexity of each operation.
- Analyze various tree data structures, such as Binary Trees, Binary Search Trees, AVL Trees, and B-Trees, implementing operations and studying their applications and performance.
- Analyze and compare sorting and hashing algorithms (e.g., Selection Sort, Quick Sort, Hashing), and apply graph traversal algorithms to solve complex problems, assessing time and space efficiency.

UNIT-I

Introduction: Basic Terminologies: Elementary Data Organizations. Data Structure Operations: insertion, deletion, traversal etc. Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off. **Searching:** Linear Search and Binary Search Techniques implementation using C & Python and their complexity analysis.

UNIT-II

Stacks and Queues using C& Python: ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms and complexity analysis. **ADT Queue:** Types of Queue: Simple Queue, Circular Queue, Priority Queue. Double ended Queue and Operations on each types of Queues and Algorithms.
Applications of queues.

UNIT-III

Linked Lists using C & Python: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue. **Doubly Linked List:** operations on it and algorithmic analysis
Circular Linked List :all operations on it. Applications of Linked List.

UNIT-IV

Trees using C & Python: Basic Tree Terminologies: Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, **AVL Tree:** Tree operations on each of the trees and their algorithms. Applications of Binary Trees, B-Tree, B+ Tree: definitions and its construction algorithm.

UNIT-V

Sorting and Hashing using C & Python: Objective and properties of different sorting algorithms: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort. Performance and Comparison among all the methods, Hashing- hash function, collision resolution methods. **Graphs:** Basic Terminologies & Representations, Applications of a Graph, Graph traversal algorithms .

TEXTBOOKS:

1. Data structures and algorithms in python by Michael T.Goodrich
2. Data Structures and Algorithmic Thinking with Python by Narasimha Karumanchi

REFERENCEBOOKS:

- HandsOnDataStructuresandAlgorithmswithPython:Writecomplexandpowerfulcodeusing the latest features of Python 3.7, 2nd Edition by Dr. Basant Agarwal, Benjamin Baka.
- DataStructuresandAlgorithmswithPythonbyKentD.LeeandSteveHubbard.
- ProblemSolvingwithAlgorithmsandDataStructuresUsingPythonbyBradleyNMiller andDavid L.Ranum.
- CorePythonProgramming-SecondEdition,R.NageswaraRao,Dreamtech**Press**

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2402ES01) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech. I Year IISem

L TPC

3 0 0 3

Course Objectives:

- To introduce the concepts of electrical circuits and its components
- To understand magnetic circuits, DC circuits and AC single phase & three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To import the knowledge of various electrical installations.
- To introduce the concept of power, power factor and its improvement.

Course Outcomes:

- Understand and solve the DC circuits using fundamental theorems and time-domain analysis to design and troubleshoot the practical DC circuits.
- Analyze and apply AC circuit principles such as phasor representation, power calculations, and power factor to optimize the efficiency of electrical systems.
- Evaluate voltage and current relationships in three-phase circuits to design the balanced three-phase systems.
- Assess transformer principles and operations including equivalent circuit analysis, efficiency, and three phase connections to enhance the performance of power distribution systems.
- Demonstrate knowledge of three-phase induction motors, DC motors, and synchronous generators for effective industrial application.
- Identify and evaluate components of low-tension switchgear and battery systems to ensure safe and efficient electrical installations in various applications.

UNIT-I:

D.C. Circuits Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time- domain analysis of first-order RL and RC circuits.

UNIT-II:

A.C. Circuits Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance in series RL- C circuit.

Three-phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III:

Transformers Ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

UNIT-IV:

Electrical Machines Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.

UNIT-V:

Electrical Installations Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXT-BOOKS/REFERENCE-BOOKS:

1. Basic Electrical Engineering - D.P. Kothari and I.J. Nagrath, 3rd edition 2010, Tata McGraw Hill.
2. D.C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. L.S. Bobrow, Fundamentals of Electrical Engineering", Oxford University Press, 2011
4. Electrical and Electronics Technology, E. Hughes, 10th Edition, Pearson, 2010.
5. Electrical Engineering Fundamentals, Vincent Deltoro, Second Edition, Prentice Hall. India, 1989.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2400BS05) APPLIED PHYSICS****B.Tech. I Year II Sem.****LT P C****3 1 0 4****Course Objectives:**

- Students will demonstrate skills in scientific inquiry, problem solving and laboratory techniques.
- Students will be able to demonstrate competency and understanding of the concepts
- Found in Quantum Mechanics, Fiber optics and lasers, Semiconductor physics.
- The graduates will be able to solve non-traditional problems that potentially draw on
- Knowledge in multiple areas of physics.
- To study applications in engineering like memory devices, transformer core and
- Electromagnetic machinery.

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

- Understand the fundamental concepts of black body radiation, quantum physics and Quantum behavior of matter in its atomic and subatomic state.
- Classify the energy bands of semiconductors, interpret the direct and indirect band gap semiconductors, identify the type of semiconductor using Hall Effect and identify the applications of semiconductors in electronic devices
- Classify different optoelectronic devices and their applications in modern technology.
- Understand the basic concepts of LASER light Sources, identifies the engineering applications of lasers, classify optical fibres based on refractive index profile and mode of propagation and identify the applications of optical fibres in various fields.
- Design, characterization, and study of properties of material help the students to prepare new materials for various engineering applications.
- Exposed to the phenomena of electromagnetism and to have exposure on magnetic materials and dielectric materials.

UNIT-I:

Quantum Mechanics :Introduction to quantum physics, Black body radiation, Photoelectric effect, Compton effect experiment and Compton shift, de-Broglie's hypothesis, Wave-particle duality, Davisson and Germer experiment, Heisenberg's Uncertainty principle, Wave function and its physical significance, Schrodinger's time independent wave equation, Particle in one dimensional box.

UNIT-II:

Semiconductor Physics :Intrinsic and Extrinsic semiconductors, Fermi level in intrinsic and extrinsic semiconductors, calculation of carrier concentration in intrinsic and extrinsic semiconductors, Carrier generation and recombination, Carrier transport: diffusion and drift, Hall effect: determination of Hall coefficient and experiment, Hall voltage, direct and indirect band

gap semiconductors, p-n junction diode: energy band diagram for open and closed circuits , Zener diode and its V-I Characteristics and applications.

UNIT-III:

Optoelectronics :Radiative and non-radiative recombination mechanisms in semiconductors, LED and Device structure, Materials, Characteristics and figures of merit, Semiconductor photo detectors: Solar cell, PIN and Avalanche and their structure , Materials, working principle and Characteristics and applications.

UNIT-IV:

Lasers and Fiber Optics Lasers: Characteristics of Lasers, interaction of radiation with matter: stimulated absorption, spontaneous and stimulated emission, Einstein's relations, Principle and working of Laser: Population inversion, Pumping mechanisms, Types of Lasers: Ruby laser, He-Ne laser, Semiconductor lasers, Applications of laser. Fiber Optics: Introduction Optical fiber, Optical fiber as a dielectric wave guide, Total internal reflection, Acceptance angle, Acceptance cone and Numerical aperture, mode and transmission of signal through Step and Graded index fibers, Losses associated with optical fibers, Applications of optical fibers in communication system (block diagram) and in other fields.

UNIT-V:

Dielectric and Magnetic Properties of Materials Electric dipole, dipole moment, dielectric constant, polarizability, electric displacement, electric susceptibility, types of polarization: electronic, ionic and orientation (qualitative) polarizations, calculation of polarizabilities of electronic and ionic polarization, Internal fields in a solid, Clausius-Mossotti equation, Ferroelectrics, Piezo electrics and Pyro electrics, Applications of dielectrics, Magnetization, field intensity, magnetic field induction, permeability and susceptibility, Bohr magneton, Classification of magnetic materials on the basis of magnetic moment, hysteresis curve based on domain theory, soft and hard magnetic materials, applications of magnetic materials.

TEXT BOOKS:

1. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learning.
2. Halliday and Resnick, Physics - Wiley.
3. A textbook of Engineering Physics, Dr. M. N. Avadhanulu, Dr. P.G. Kshirsagar - S.Chand

REFERENCES:

1. Richard Robinett, Quantum Mechanics
2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, Mc Graw-Hill inc.(1995).
3. Online Course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Guptha on NPTEL
4. "Semiconductor Physics And Devices", McGraw Hill, 4th Edition by Donald Neamen
5. Introduction to Solid State Physics by Charles Kittel, Wiley student edition.
6. S.M. Sze, Semiconductor Devices: Physics and Technology, Wiley (2008)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2403ES61) ENGINEERING WORKSHOP

B.Tech. I Year II Sem

L / T/ P/C

0/ 0 / 3/ 1.5

Course Objectives:

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineering products.
- To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at workplace.
- To study commonly used carpentry joints and to have practical exposure to various welding and joining processes.

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

- Identify and make use of various tools to perform a range of basic manufacturing operations in different trades to make/repair engineering components with workshop safety regulations.
- Illustrate knowledge of various trade operations based on requirements of the job.
- Illustrate knowledge of various trade tools based on requirements of the job.
- Interpret and establish residential wiring circuits according to given specifications and circuit diagram.
- Demonstrate working principles of power tools in different trades to use and to make with them engineering components.
- Develop model various basic prototypes to explore its functions and features of an innovative system.

I. Carpentry

1. Cross lapjoint
2. Mortise &tenon joint

II. Fitting

1. V- fitting
2. Semi - Circular Fitting

III. Tin Smithy

1. Making of Rectangular Tray
 2. Making of Conical Funnel
-

IV. Housing wiring

1. Two points controlled by two-one way switches(parallel connection)
2. One point controlled by two-two way switches(stair case connection).

V. Foundry

1. Single piece pattern
2. Multi-piece pattern

VI. Black Smithy

1. Round to Square
2. S - Hook

Trades for Demonstration:

1. Plumbing
2. Welding
3. Machine Shop
4. Metal Cutting (WaterPlasma)

TEXT BOOKS:

1. Workshop Manual, P. Kannaiah and K. L. Narayana, 3rd Edition, Scitech,2015
2. Elements of Workshop Technology Vol.1 & 2, S. K. Hajra Choudhury, A. K. Hajra Choudhury and Nirjhar Roy, 13th Edition, Media Promoters & Publishers Pvt. Ltd., 2010.

REFERENCE BOOKS:

1. Workshop Manual / Venkat Reddy/ BSP
2. Workshop Manual / K Venu Gopal / Anuradha

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2402ES61) BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

B.Tech. I Year II Sem

LTPC
0 0 2 1

Course Objectives:

- To analyze a given network by applying various electrical laws and network theorems
- To know the response of electrical circuits for different excitations
- To calculate, measure and know the relation between basic electrical parameters.
- To analyze the performance characteristics of DC and AC electrical machines

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

- Get an exposure to basic electrical laws by applying Ohm's Law, KCL and KVL.
- Understand the response of different types of electrical circuits to different excitations.
- Illustrate the concept of resonance in series RLC circuits.
- Calculate and analyze the impedance of RL, RC, and RLC series circuits.
- Analyze performance of dc motors, transformers and three phase induction motors.
- Understand the measurement and calculation of voltage-current in a balanced three phase circuits.

List of experiments/demonstrations:

1. Verification of OhmsLaw
2. Verification of KVL and KCL
3. Transient Response of Series RL and RC circuits using DC excitation
4. Transient Response of RLC Series circuit using DC excitation
5. Resonance in series RLC circuit
6. Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits
7. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single Phase Transformer
8. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
9. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star)
10. Measurement of Active and Reactive Power in a balanced Three-phase circuit
11. Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor
12. Torque-Speed Characteristics of a Separately/Self Excited DC Shunt/Compound Motor
13. Performance Characteristics of a Three-phase Induction Motor
14. Torque-Speed Characteristics of a Three-phase Induction Motor
15. No-Load Characteristics of a Three-phase Alternator

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405ES62) DATA STRUCTURES AND ALGORITHM LAB

B.Tech. I Year II Sem

LTPC
0 05 2.5

Course Objectives:

- To make the student to implement data structures using python and C programming languages.
- To make the student write ADTS for all data structures.

Course Outcomes:

At the end of the course the students can:

- For a given algorithm student will be able to analyze the algorithms to determine time & computation complexity and justify the correctness.
- For a given Search problem (Linear Search and Binary Search) student will be able to implement it.
- For a given problem of Stacks, Queues and linked list student will be able to implement it and analyze the same to determine the time and computation complexity.
- Student will be able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.
- Implement and analyze search algorithms (Linear and Binary Search), comparing recursive and non-recursive approaches in terms of time complexity.
- Develop and apply fundamental sorting algorithms (Bubble, Selection, Quick, Insertion, Merge, and Heap Sort) to arrange data in order and evaluate their efficiency based on time and space complexity.

Week1:

Write a C program and Python program to implement the following searching techniques in both recursive and non-recursive manner.

- i) Linear search ii) Binary Search.

Week 2:

Write a C & Python program to implement the following using List and Dictionary.

- i)Stack ii) Queue

Week 3:

Write a C & Python program to implement Linked list data structure and perform the following operations.

- i) Insert an element into a list. ii) Delete an element from list iii) Search for a key element in list
iv) count number of nodes in list.

Week 4:

Write a C & Python program to implement the following using a singly linked list.

- i) Stack ii) Queue

Week 5:

Write a C & Python program to implement the Deque (double ended queue)ADT using a List.

Week 6:

Write a C& python program to perform the following operations:

- a) Insert an element into a binary search tree.
- b) Delete an element from a binary search tree.
- c) Search for a key element in a binary search tree.

Week 7:

Write a C & Python program that uses recursive functions to traverse the given binary search tree in a)Preorder b) inorder and c) postorder.

Week 8:

Write a C & Python program to perform the following operations

- i)Insertion into aB-tree
- ii)Deletion from a B-tree

Week 9:

Write a C&Python program to construct AVL tree and perform the following operation.

- a) Insertion into an AVL-tree

Week 10:

Write a C & Python program to implement hash table and perform the following operations.

- a) Inserting a key-value pair b) Deleting a key-value pair

Week 11:

Write a C & Python program for implementing the following sorting methods. a)Merge sort
b) Heapsort

Week 12:

Write a C & Python program to implement the following sorting techniques.

- i)Bubble sort ii) Selection sort iii)Quicksort iv) Insertions ort

Week 13:

Write a C & Python program to implement the Graph Traversal Techniques.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400BS61) APPLIED PHYSICS LAB

B.Tech. I Year I Sem

LTPC
0 0 2 1

Course Objectives:

- Determine the energy band gap of a semiconductor using a p-n junction diode.
- Analyze the characteristics of solar cells and their efficiency.
- Study the V-I characteristics of Light Emitting Diodes (LEDs).
- Measure magnetic induction using Stewart and Gee's experiment.
- Apply the Hall effect to determine carrier concentration in materials.
- Explore optical fiber properties, including numerical aperture and bending loss.

Course Outcomes:

- Demonstrate classification of semiconductors with calculation of energy band gap.
- Explain the characteristics and critical values of simple electronic circuits like solar cell, Laser diode and light emitting diode.
- Calculation of the physical values like Planks constant using principles of optical phenomenon
- Demonstrate the electric and magnetic field effects involved in Stewart and Gee's Experiment and Hall Effect experiment.
- Demonstrate how to calculate the numerical aperture and bending losses associated with fibers.
- Calculate the time constant of RC circuit and frequency response of LCR series and parallel circuits.

List of Experiments:

Note : Any 8 Experiments to be Performed

1. **Energy gap of a PN junction diode**
To determine the energy band gap of a semiconductor p-n junction diode
2. **Solar Cell**
Characteristics of a given Solar Cell
3. **Light Emitting Diode**
To study the VI characteristics of a Light Emitting Diode
4. **Stewart and Gee's Experiment**
To determine the magnetic induction at the center and at several points on the axis of a circular coil
5. **HALL Effect Experiment**
Determination of hall coefficient and Hall voltage ,To calculate the Hall coefficient and the carrier concentration of the sample material.
6. **Photoelectric Effect**

To determine the work function of a given material.

7. **LASER**

To study the characteristics of LASER diode Sources.

8. **A) Optical Fiber Numerical Aperture**

To determine the numerical Aperture (NA) of the given optical fiber

B) Optical Fiber Bending Loss

To determine the loss caused in optical fibers in dB due to macro bending of the fiber

9. **A) LCR series Circuit**

To study the frequency response of LCR series circuits and to determine the Resonant Frequency.

B) LCR Parallel Circuit

To study the frequency response of LCR parallel circuits and to determine the Resonant Frequency.

10. **R-C Circuit**

To determine the time constant of the given RC circuit

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC01)ENVIRONMENTAL SCIENCE

B.Tech. I Year I Sem

LTP C
2 0 0 0

Course Objectives:

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

Course Outcomes:

- Develop critical-thinking skills, analyze real-world problems, and understand the power of narrative to create sustainable solutions for local and global communities.
- Understand the scarcity of natural resources and will be able to replace them with alternative energy resources for the sustainability of environmental society & economy.
- Recognize the type of biodiversity along the values & conservation biodiversity and know about the bio geographical regions
- Categorize the types of environmental pollution & the various treatment technologies for the diminution of environmental pollutants and contaminants.
- Summarize the global environmental issues to create awareness about the international conventions and protocols for extenuating global environmental issues.
- Understand the importance of environmental legislation policies, sustainable development and concept of green building

UNIT-I

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnifications, ecosystem value, services and carrying capacity, Field visits.

UNIT-II

Natural Resources: Classification of Resources: Living and Non-Living resources, **water resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III

Biodiversity And Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waste:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Issues and Global Efforts:** Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC- GoI initiatives.

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). **Towards Sustainable Future:** Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon lifestyle.

TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

REFERENCE BOOKS:

- Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
- Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008

PHI Learning Pvt. Ltd.

- Environmental Science by Daniel B. Botkin& Edward A. Keller, Wiley INDIA edition
- Environmental Studies by AnubhaKaushik, 4th Edition, New age international publishers.
- Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications

II B.TECHSYLLABUS (IT)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC01) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

B.Tech. II Year II Sem**LTPC**
3 0 0 3**Course Objectives:**

- Use mathematically correct terminology and notation.
- Construct correct direct and indirect proofs.
- Use division into cases in a proof.
- Use counter examples.
- Apply logical reasoning to solve a variety of problems.

Course Outcomes:

At the end of the course the students are able to:

- Comprehend the syntax, semantics, and validity of propositional logic, including truth tables, logical equivalence, and rules of inference.
- Apply operations on sets, relations, and functions, including Cartesian products, equivalence relations, bijective functions, and concepts like countable and uncountable sets.
- Understand algebraic structures such as semi-groups, monoids, groups, and rings, and analyze the properties of Boolean algebra and Boolean rings.
- Use basic counting techniques, including permutations, combinations, and the pigeonhole principle, to solve combinatorial problems.
- Analyze the properties of graphs and trees, including connectivity, Eulerian/Hamiltonian paths, graph coloring, and rooted trees for applications in sorting and coding.
- Apply mathematical induction, the well-ordering principle, and recursive definitions to prove mathematical statements and solve number theory problems.

UNIT-I

Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, Normal Forms, Disjunctive and Conjunctive Normal Form, The use of Quantifiers.

UNIT-II

Sets, Relation and Function: Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets.

Mathematical Induction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers,

UNIT-III

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Abelian Group, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function.

UNIT-IV

Elementary Combinatorics: Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutations and combinations With Repetition and Without Repetition.

UNIT-V

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Colouring, Colouring maps and Planar Graphs, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi-connected component and Articulation Points, Shortest distances.

TEXT BOOKS:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw–Hill
2. Susanna S. Epp, Discrete Mathematics with Applications, 4th edition, Wadsworth Publishing Co. Inc.
3. C L Liu and D P Mohapatra, Elements of Discrete Mathematics A Computer Oriented Approach, 3rd Edition by, Tata McGraw–Hill.

REFERENCE BOOKS:

- J.P. Tremblay and R. Manohar, “Discrete Mathematical Structure and It’s Application to Computer Science”, TMG Edition, Tata McGraw-Hill
- Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press. Schaum’s Outlines Series, Seymour Lipschutz, Marc Lipson,
- Discrete Mathematics, Tata McGraw–Hill

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC05)COMPUTER ORGANIZATION AND ARCHITECTURE

B.Tech. II Year I Sem**L T P C****3 0 0 3****Course Objectives:**

- **Understand digital computer components** including registers, transfer language, and micro-operations.
- **Implement and analyze microprogramming** concepts, control memory, and control unit design.
- **Learn number representations** and arithmetic operations such as addition, subtraction, multiplication, division, and floating-point arithmetic.
- **Examine I/O interfaces, memory hierarchies**, and design of memory units like cache and associative memory.
- **Compare RISC and CISC architectures** and apply this knowledge in CPU design.
- **Explore advanced processing techniques** like pipelining, vector processing, and multiprocessor systems, focusing on synchronization and cache coherence.

Course Outcomes:

At the end of course student will be able to-

- Describe the components, organization, and architecture of digital computers, including register transfer language and micro-operations.
- Implement and analyze microprogramming concepts, control memory, and design control units.
- Understand data types, number representations, and arithmetic operations (addition, subtraction, multiplication, division, floating-point arithmetic).
- Analyze input-output interfaces, memory hierarchies, and design memory units such as cache and associative memory.
- Differentiate between RISC and CISC characteristics and apply this knowledge to CPU design.
- Understand pipelining, vector processing, and multiprocessor systems, including synchronization and cache coherence.

UNIT-I**Digital Computers:**

Introduction, Block diagram of Digital Computer, Definition of Computer Organization, Computer Design and Computer Architecture. **Register Transfer Language and Micro operations:** Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. **Basic Computer Organization and Design:** Instruction codes, Computer Registers Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions,

Input – Output and Interrupt.

UNIT-II

Microprogrammed Control: Control memory, Address sequencing, micro program example, design of control unit. **Central Processing Unit:** General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation, Program Control.

UNIT-III

Data Representation:Data types, Complements, Fixed Point Representation, Floating Point Representation.**Computer Arithmetic:** Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.

UNIT-IV

Input-Output Organization:Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.**Memory Organization:** Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

UNIT-V

Reduced Instruction Set Computer:CISC Characteristics, RISC Characteristics.

Pipeline and Vector Processing:Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processor.**Multi Processors:** Characteristics of Multiprocessors, Interconnection Structures, Interprocessor arbitration, Interprocessor communication and synchronization, Cache Coherence.

TEXT BOOK:

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

REFERENCES:

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC04) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

B.Tech. II Year I Sem

LTPC
3 1 0 4

Course Objective:

- The objective of this course is to provide object-oriented concepts through which robust, secured and reusable software can be developed.
- To understand object-oriented principles like abstraction, encapsulation, inheritance and polymorphism and apply them in solving problems.
- To understand the principles of inheritance and polymorphism and demonstrate how they relate to the design of abstract classes.
- To understand the implementation of packages and interfaces.
- To understand the concepts of exception handling, multithreading and collection classes.
- To understand the design of Graphical User Interface using applets and swing controls.

Course Outcomes:

At the end of the course the students are able to:

- Understand the fundamental principles of object-oriented thinking, including agents, communities, classes, instances, and the significance of inheritance and method binding
- Create simple Java programs utilizing data types, variables, operators, control flow structures, and basic I/O operations, as well as understanding memory management concepts
- Design and implement class hierarchies using inheritance, apply the super keyword, and utilize polymorphism through method overloading and overriding in practical scenarios.
- Apply exception handling techniques to manage errors in Java applications, analyze multithreading concepts by creating and synchronizing threads effectively.
- Understand and apply the Java Collections Framework to manipulate data structures, and illustrate file handling capabilities using byte and character streams, along with relevant utility classes.
- Create interactive GUI applications using Swing components, manage event handling, and understand the differences between AWT and Swing, including layout management techniques.

UNIT-I

Object-oriented thinking- A way of viewing world – Agents and Communities, messages and methods, Responsibilities, Classes and Instances, Class Hierarchies- Inheritance, Method

binding, Overriding and Exceptions, Summary of Object-Oriented concepts.

An Overview of Java -History of Java, comments, Data types, Variables, Constants, Scope and Life time of variables, Operators, Type conversion and casting, Enumeration, Control flow block scope, conditional statements, loops, break and continue statements, simple java standalone programs, arrays, console input and output, classes, methods, constructors, static, this keyword, recursion, exploring string classes and garbage collection.

UNIT – II

Inheritance–Inheritance hierarchy, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.

Polymorphism–dynamic binding, Constructor and method overloading, method overriding, abstract classes.

Interfaces–Interfaces Vs Abstract Classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface, inner class.

Packages–Defining, creating and accessing a package, CLASSPATH, Access modifiers, importing packages.

UNIT-III

Exception Handling–Dealing with errors, benefits of exception handling, the classification of exceptions - exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, creating own exception subclasses.

Multithreading – Differences between multiple processes and multiple threads, thread lifecycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication-producer consumer problem.

UNIT-IV

Collection Framework in Java – Introduction to java collections, Overview of java collection framework, Commonly used collection classes-ArrayList, LinkedList, HashSet, TreeSet, Map-HashMap, TreeMap, Legacy Classes-Vector, Stack, Hashtable.

Other Utilities-Scanner, String Tokenizer, Random, Date.

Files-Streams-Byte Streams, Character Streams, Text input/output, Binary input /output , File Management using File class.

UNIT-V

Applets – Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet and Passing parameters to applets

GUI Programming - Swing -The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Overview of Swing components – JButton, JLabel, JTextField, JCheckBox, RadioButton, JTextArea, etc simple Swing applications, Layout managers–FlowLayout, BorderLayout, GridLayout and GridBagLayout.

Event Handling-Events, Event sources, Event classes, Event Listeners, Delegation event model, Handling Mouse and Key events, Adapter classes.

TEXTBOOKS:

1. Java Fundamentals–A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education

REFERENCE BOOKS:

1. Java for Programmers, P.J. Deitel and H.M. Deitel, PEA(or) Java: How to Program , P.J. Deitel and H.M. Deitel, PHI
2. Object Oriented Programming through Java, P.RadhaKrishna, Universities Press.
3. Thinking in Java, Bruce Eckel, PE
4. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.
5. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC08) DATABASE MANAGEMENT SYSTEMS

B.Tech. II Year I Sem**L T P C**
3 1 0 4**Course Objectives:**

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- To understand the relational database design principles.
- To become familiar with the basic issues of transaction processing and concurrency control.
- To become familiar with database storage structures and access techniques.

Course Outcomes:

At the end of course student will be able to-

- Analyze the architecture and purpose of database systems, including database languages and data retrieval methods, to understand their role in data management and application domains.
- Design entity-relationship (ER) models and develop conceptual schemas for database systems, effectively representing entities, relationships, and attributes in complex, large-scale enterprise databases.
- Construct relational database schemas by transforming ER models into the relational model, enforcing integrity constraints, and creating views to ensure logical data consistency and accessibility.
- Develop complex SQL queries, including nested queries and triggers, and apply normalization techniques to refine schema design, ensuring data integrity and minimizing redundancy in database applications.
- Evaluate transaction management and concurrency control protocols, such as lock-based and timestamp-based protocols, to ensure atomicity, isolation, and durability in multi-user database environments.
- Implement storage and indexing mechanisms, including B+ trees and ISAM, to optimize data access and storage efficiency, facilitating efficient query processing and database performance.

UNIT – I:

Introduction: Database System Applications, Purpose of Database Systems, View of Data, Database Languages – DDL, DML, Relational Databases, Database Design, Database Architecture, Data Mining and Information Retrieval, Database Users and Administrators, History of Database Systems.

Introduction to Data base design: Database Design and ER diagrams, 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.

UNIT – II:

Relational Model: Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design: ER to Relational, Introduction to Views, Destroying /Altering Tables and Views.

Relational Algebra and Calculus: Preliminaries, Relational Algebra, Relational calculus– Tuple relational Calculus, Domain relational calculus.

UNIT – III:

SQL: Queries, Constraints, Triggers: Form of Basic SQL Query, UNION, INTERSECT, and EXCEPT, Nested Queries, Aggregate Operators, NULL values, Natural JOINS, Complex Integrity Constraints in SQL, Triggers and Active Data bases.

Schema Refinement and Normal Forms: Introduction to Schema Refinement, Functional Dependencies - Reasoning about FDs, Normal Forms, Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies.

UNIT – IV:

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

Concurrency Control: Lock–Based Protocols, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols.

Recovery System-Failure Classification, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with loss of nonvolatile storage, Remote Backup systems.

UNIT – V:

Storage and Indexing: Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing, Index Data Structures, Comparison of File Organizations. Tree-Structured Indexing: Intuition for tree Indexes, Indexed Sequential Access Method (ISAM), **B+ Trees:** A Dynamic Index Structure, Search, Insert, Delete.

TEXT BOOKS:

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education (India) Private Limited, 3rd Edition. (Part of UNIT-I, UNIT-II, UNIT-III, UNIT-V)
2. Data base System Concepts, A. Silberschatz, Henry. F. Korth, S. Sudarshan, McGraw Hill Education (India) Private Limited, 6th edition. (Part of UNIT-I, UNIT-IV)

REFERENCE BOOKS:

1. Database Systems, 6th edition, R Elmasri, ShamkantB.Navathe, Pearson Education.
2. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning.
3. Introduction to Database Management, M. L. Gillenson and others, Wiley Student Edition.
4. 4.Database Development and Management, Lee Chao, Auerbach publications, Taylor& Francis Group. Introduction to Database Systems, C. J. Date, Pearson Education.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400HS03)BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

B.Tech. II Year I Sem.

L T P C
3 0 0 3

Course Objective:

- To learn the basic business types, impact of the economy on Business and Firms specifically.
- To analyze the Business from the Financial Perspective.

Course Outcome:

At the end of course student will be able to-

1. **CO1:** Understand the significance of economics in business and understand macroeconomic concepts like national income, inflation, and business cycles.
2. **CO2:** Analyze demand and supply situations and apply forecasting techniques to predict market behaviour and plan business strategies.
3. **CO3:** Evaluate production and cost functions and apply knowledge of market structures and pricing strategies to enhance business efficiency.
4. **CO4:** Record and summarize financial transactions using double-entry bookkeeping and prepare essential financial statements.
5. **CO5:** Interpret financial statements using ratio analysis for decision-making regarding liquidity, profitability, and solvency of a business.
6. **CO6:** Integrate economic and financial knowledge in solving practical business problems and support decision-making across functions.

UNIT-I: Introduction to Business and Economics

Economics: Significance of Economics, Micro and Macro Economic Concepts, Concepts and Importance of National Income, Inflation, Money Supply and Inflation, Business Cycle, Features and Phases of Business Cycle. Nature and Scope of Business Economics, Role of Business Economist, Multidisciplinary nature of Business Economics.

Business: Structure of Business Firm, Theory of Firm, Types of Business Entities, Limited Liability Companies, Sources of Capital for a Company, Non-Conventional Sources of Finance.

UNIT-II: Demand and Supply Analysis

Elasticity of Demand: Elasticity, Types of Elasticity, Law of Demand, Measurement and Significance of Elasticity of Demand, Factors affecting Elasticity of Demand, Elasticity of Demand in decision making, Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting, Methods of Demand Forecasting.

Supply Analysis: Determinants of Supply, Supply Function and Law of Supply

UNIT-III: Production, Cost, Market Structures& Pricing

Production Analysis: Factors of Production, Production Function, Production Function with one variable input, two variable inputs, Returns to Scale, Different Types of Production Functions.

Cost analysis: Types of Costs, Short run and Long run Cost Functions.

Market Structures: Nature of Competition, Features of Perfect competition, Monopoly, Oligopoly, and Monopolistic Competition.

Pricing: Types of Pricing, Product Life Cycle based Pricing, Break Even Analysis

UNIT - IV: Financial Accounting: Accounting concepts and Conventions, Accounting Equation, Double-Entry system of Accounting, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance, Elements of Financial Statements, Preparation of Final Accounts (Simple Problems).

UNIT - V: Financial Ratios Analysis: Concept of Ratio Analysis, Importance and Types of Ratios, Liquidity Ratios, Turnover Ratios, Profitability Ratios, Proprietary Ratios, Solvency, Leverage Ratios – Analysis and Interpretation (simple problems).

TEXTBOOKS:

1. D. D. Chaturvedi, S. L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd. 2013.
2. Dhanesh K Khatri, Financial Accounting, Tata Mc–GrawHill, 2011.
3. Geethika Ghosh, PiyaliGosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata Mc Graw Hill Education Pvt. Ltd. 2012.

REFERENCEBOOKS:

1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press, 2015.
2. S.N. Maheshwari, Sunil K Maheshwari, Sharad K Maheshwari, Financial Accounting, 5e, Vikas Publications, 2013.

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MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC63) OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

B.Tech. II Year ISem

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Course Objectives:

- To prepare students to become familiar with the Standard Java technologies of J2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE, JSP and JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate java programming issues to broader application context.
- To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful professional career.

Course Outcomes:

At the end of course student will be able to-

- Understand OOP concepts such as classes, objects, inheritance, polymorphism, and encapsulation
- Apply OOP principles to design and implement solutions to programming problems effectively
- Implement exception handling mechanisms to manage runtime errors and ensure robust program execution
- Create and manage threads, ensuring safe and efficient concurrent programming.
- Analyse commonly used Java libraries and APIs, including the Collections Framework, Java I/O, and other utility classes.
- Design and create GUIs using Java Swing, incorporating event handling for user interactions.

Week 1:

- a) Write a java program to find the Fibonacci series using recursive and non recursive functions.
- b) Write a java program to multiply two given matrices.

Week 2:

- a) Write a java program for Method overloading and Constructor overloading.
- b) Write a java program to display the employee details using Scanner class.
- c) Write a java program that checks whether a given string is palindrome or not.

Week 3:

- a) Write a java program to represent Abstract class with example.
- b) Write a java program to implement Interface using extends keyword.

Week 4:

- a) Write a java program to create user defined package.

Week 5:

- a) Write a java program to create inner classes.
- b) Write a java program for creating multiple catch blocks.
- c) Write a Java Program for creating User Defined Exception.

Week 6:

- a) Write a java program for producer and consumer problem using Threads.
- b) Write a Java program that implements a multi-thread application that has three threads.

Week 7:

- a) Write a java program to implement all file operations.
- b) Write a Java Program to list all the files in a directory including the files present in all its sub directories.

Week 8:

- a) Write a java program to represent ArrayList class.
- b) Write a Java program loads phone no, name from a text file using Hashtable.

Week 9:

- a) Write an applet program that displays a simple message.
- b) Write a Java program compute factorial value using Applet.
- c) Write a program for passing parameters using Applet.

Week 10:

- a) Write a java program for handling Mouse events and Key events

Week 11:

- a) Write a java program that works as a simple calculator. Use a Grid Layout arrange Buttons for digits and for the + - * % operations. Add a text field to display the result.

TEXT BOOK/ REFERENCE BOOKS:

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Java for Programmers, P.J. Deitel and H.M. Deitel, PEA (or) Java: How to Program , P.J. Deitel and H.M. Deitel, PHI

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC64) DATABASE MANAGEMENT SYSTEMS LAB

B.Tech. II Year I Sem

LTPC
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Course Objectives:

Students will have the ability to:

- Keep abreast of current developments to continue their own professional development.
- To engage themselves in lifelong learning of Database management systems theories and technologies this enables them to pursue higher studies.
- To interact professionally with colleagues or clients located abroad and the ability to overcome challenges that arises from geographic distance, cultural differences, and multiple languages in the context of computing.
- Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications

Course Outcomes:

Students will be able to demonstrate their skills

- Design entity-relationship (E-R) models to represent complex database systems, accurately identifying entities, attributes, and various types of keys to enhance data integrity and efficiency.
- Construct and manipulate relational database tables using DDL and DML commands in MySQL, effectively implementing normalized data structures to manage and persistently store essential data.
- Formulate and execute advanced SQL queries involving subqueries, joins, views, and aggregate functions to retrieve, manipulate, and analyze data from multiple tables, addressing complex data requirements
- Develop PL/SQL procedures and triggers to automate tasks, enforce data integrity, and apply business rules, ensuring robust and dynamic database applications.
- Apply normalization principles (1NF, 2NF, 3NF) to decompose tables, minimize redundancy, and enhance database structure, ensuring consistency and reducing data anomalies.
- Demonstrate the use of transaction control operations (COMMIT, ROLLBACK, SAVEPOINT) and access control commands (GRANT, REVOKE) to manage database permissions, data integrity, and recovery, maintaining secure and efficient database systems.

A. Practice on SQL Queries to acquire knowledge on RDBMS.

B. Case Study:

Objective: This lab enables the students to practice the concepts learnt in the subject DBMS by

developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database -Roadway travels". Students are expected to use "Mysql" database.

Roadway Travels: "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations
- Reservations & Cancellation :

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger .One Passenger /person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above Process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships, 2. E-R Model, 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it using software design tool. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

Entities:

- a) BUS
- b) Ticket
- c) Passenger

Relationships:

- a) Reservation
- b) Cancellation

PRIMARY KEY ATTRIBUTES:

- a) Ticket ID (TicketEntity)
- b) Passport ID(PassengerEntity)
- c) Bus_NO(BusEntity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.

Ex: Bus Entity

Ex: Reservation relationship

Note: *The student is required to submit a document by writing the Entities and Keys to the lab teacher*

Experiment 2: Installation of Mysql and practicing DDL, commands

Installation of MySQL. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger ( Passport_id INTEGER PRIMARY KEY, Name  
                           VARCHAR(50) NotNULL,
```

```
Age Integer Not NULL, Sex Char,
```

```
Address VARCHAR (50) Not NULL);
```

Similarly create all other tables.

Note: Detailed creation of tables is given at the end. Experiment 3: Practicing DML commands

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the adatabase
- INSERT - insert data into atable
- UPDATE - updates existing data within atable
- DELETE-deletes all records from a table, the space for the recordsremain

Inserting values into "Bus" table:

Insert into Bus values (1234,'hyderabad', 'tirupathi'); Insert into Bus values (2345,'hyderabd' 'Banglore'); Insert into Bus values (23,'hyderabd','Kolkata'); Insert into Bus values (45,'Tirupathi','Banglore'); Insert into Bus values (34,'hyderabd','Chennai');

Inserting values into "Passenger" table:

Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123'); Insert into Passenger values (2, 78,'geetha', 36,'F','abc124'); Insert into Passenger values (45, 90,' ram', 30,'M','abc12'); Insert into Passenger values (67, 89,' ravi', 50,'M','abc14'); Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');

Few more Examples of DML commands:

Select * from Bus; (selects all the attributes and display) UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 4: Querying

In this week you are going to practice queries(along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

Display unique PNR_no of all Passengers. Display all the names of male passengers. Display the ticket numbers and names of all the passengers.

Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'. Find the names of passengers whose age is between 30 and 45.

Display all the passengers names beginning with 'A' Display the sorted list of passengers names

Experiment 5: Aggregate Functions and Number Functions, Nested Query and Co-related Queries You are going to practice queries using Aggregate functions and number functions(COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.

Display the number of days in a week on which the 9W01 bus is available.

Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.

Find the distinct PNR numbers that are present.

Find the number of tickets booked by a passenger where the number of seats is greater than 1.Hint: Use GROUP BY, WHERE and HAVINGCLAUSES.

Find the total number of cancelled seats.

Nested Query and Co-related Queries

Use the tables sailors, reserves, boats for implementing the following Sailors (sid: integer, sname: string, rating: integer, age: real);

Boats(bid: integer, bname: string, color: string); Reserves(sid: integer, bid: integer, day: date).

- Find the names of sailors who have reservedboat103
- Find the name and the age of the youngestsailor
- Find the names and ratings of sailor whose rating is better than some sailor called Horatio
- Find the names of sailors who have reserved allboats

Experiment 6: VIEWS and JOIN

In this week, we are going to implement views and also perform various operations like alter, update and delete commands.

View:

Write a query to execute and verify the SQL commands using Views (Use Employee Table)

(a) Alter (b) Update (c) Delete

Join:

Write a query to execute and verify the SQL commands using Join (Use Customer Table)

(a) Inner join, (b).Left join, (c).Right join (d).Full join

Experiment 7: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: CREATE TRIGGER up d check BEFORE UPDATE ON passenger FOR EACH ROW BEGIN

IF NEW.Ticket N0 > 60 THEN SET

New.Ticket no = Ticket no; ELSE SET New.Ticket no = 0; END IF;

END;

Experiment 8: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()

BEGIN

SELECT COUNT(Tickets) FROM Ticket WHERE age>=40; End;

Experiment 9: Cursors

In this week you need to do the following: Declare a cursor that defines a result set.

Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

CREATE PROCEDURE myProc (in_customer_id INT) BEGIN DECLARE v_id INT;

DECLARE v_nameVARCHAR(30);

DECLAREclCURSORFORSELECTppno,nameFROMPassengerWHEREppno=in_customer_id;

OPENcl;

FETCH cl

intov_id, v_name; Close cl; END Tables BUS

Bus No: Varchar:

PK (Primary key) Source: Varchar Destination:

VarcharDeptTime:VarcharPassenger

PPNO: Varchar(15)) :

PK Name:

Varchar(15) Age : int (4) Sex:Char(10) : Male/Female Address: VarChar(20)

Passenger_Tickets

PPNO: Varchar(15)) : FK Ticket No: Numeric (9)

Reservation

PNR_No: Numeric(9) :

PK Journey_date :datetime(8) No_of_seats : int (8) Address: Varchar(50) Contact_No: Numeric

(9) —> Should not be less than 9 and Should not accept any other character other than Integer
Status: Char (2) : Yes / No

Cancellation

PNR_No:Numeric(9):

FK Journey_date:datetime (8) No_of_seats : int (8) Address : Varchar (50)
Contact_No: Numeric (9) —> Should not be less than 9 and should not accept any other character other than Integer
Status: Char (2) : Yes / No

Ticket

Ticket_No: Numeric(9):
PK Journey_date :datetime(8) Age : int (4)
Sex:Char(10):Male/Female
Source :Varchar Destination :VarcharDep_time :Varchar

Experiment 10: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.

Passenger				
Name	Age	Sex	Address	<u>Passport ID</u>
Passport_idTicket_id				

You can do these cond and third normal forms if required. And how Normalize dtables are given at the end.

Experiment 11: PL/SQL Programs

In this week, you are going to learn and work on PL/SQL procedures.

- Write a PL/SQL procedure to find the average of marks?
- Write a PL/SQL procedure to find the factorial of a number?
- Write a PL/SQL code to calculate tax for an employee of an organization–XYZ and to display his/her name & tax, by creating table under employee database as below.

Employee_salary	Emp_no	Basic HRA DA	Total_deduction
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Net_salary

Gross_salary

Experiment 12: Revoke/Grant/Commit/Rollback

In this week, you need to do the following: Declare a table that defines a result set using revoke, grant, save point, commit, rollback operations

Consider the following tables namely “DEPARTMENTS” and “EMPLOYEES” Their schemas are as follows, Departments (dept_no , dept_name , dept_location); Employees (emp_id , emp_name , emp_salary);

1. Develop a query to grant all privileges of employee table into department table
2. Develop a query to grant some privileges of employee table into department table
3. Develop a query to revoke all privileges of employee table from department table
4. Develop a query to revoke some privileges of employees table from department table
5. Write a query to implement the savepoint
6. Write a query to implement the commit
7. Write a query to implement rollback

Reference Books:

1. Introduction to SQL, Rick F. Vander Lans, Pearson Education.
2. Oracle PL/SQL, B. Rosenzweig and E. Silvestrova, Pearson Education.
3. Oracle PL/SQL Programming, Steven Feuerstein, SPD.
4. SQL & PL/SQL for Oracle 10g, Black Book, Dr. P. S. Deshpande, DreamTech
5. Oracle Database 11g PL/SQL Programming, M. McLaughlin, TMH
6. SQL Fundamentals, J. J. Patrick, Pearson Education

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC03) HUMAN VALUES AND PROFESSIONAL ETHICS**B.Tech. II Year I Sem****LTPC**
2 0 0 0**Course Objective:**

To enable the students to imbibe and internalize the Values and Ethical Behaviour in the personal and Professional lives.

Course Outcomes:

Students will be able to demonstrate their skills

- Evaluate the concepts of human values, including self-exploration and natural acceptance, and assess their role in fostering happiness and prosperity as fundamental human aspirations.
- Analyze the principles of harmony in family and society, including values such as trust and respect, and develop strategies to promote a harmonious, universally unified society.
- Differentiate between personal and professional ethics, including ethical dilemmas, and apply concepts of life skills and emotional intelligence to navigate ethical decisions in a professional context.
- Interpret the ethical responsibilities and moral values in engineering practices by examining real-world case studies, and evaluate the impact of professional codes of conduct on workplace norms and accountability
- Analyzation of global ethical issues, including sustainable development, technology globalization, and corporate governance, and propose solutions to address these challenges in a professional setting.
- Assess the ethical implications of emerging global concerns—such as media, war, and bioethics—and develop frameworks for ethical decision-making regarding intellectual property rights and environmental sustainability.

UNIT - I:

Introduction to Human Values: Need, basic Guidelines, Content and Process for Value Education, Self Exploration - 'Natural Acceptance' and Experiential Validation. Continuous Happiness and Prosperity - A look at basic Human Aspirations. Right understanding, Relationship and Physical Facilities. Understanding Happiness and Prosperity correctly

UNIT - II:

Understanding Harmony in the Family and Society: Harmony in Human - Human Relationship: Understanding harmony in the Family the basic unit of human interaction. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship. Understanding the harmony in the society (society being an extension of

family). Visualizing a universal harmonious order in society - Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha) - from family to worldfamily!

UNIT – III:

Introduction to Professional Ethics: Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

UNIT – IV:

Professional Practices in Engineering: Work Place Rights & Responsibilities, Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics, the limits of predictability and responsibilities of the engineering profession. Central Responsibilities of Engineers – The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.

UNIT – V:

Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues, Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Depletion, Pollution, Ethics in Manufacturing and Marketing, Media Ethics, War Ethics, Bio Ethics, Intellectual Property Rights.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
3. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press 2015.

REFERENCE BOOKS:

1. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.
2. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
3. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e, Cengage Learning, 2015.
4. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2400BS04) PROBABILITY AND STATISTICS****B.Tech. II Year I Sem****LTPC****3 0 0 3****Course Objectives: To learn**

- A random variable that describes randomness or an uncertainty in certain realistic situation. It can be of either discrete or continuous type. Study of the Binomial and the Poisson random variables and the Normal random variable and their probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- The types of sampling, Sampling distribution of means, sampling distribution of variance, Estimations of statistical parameters.
- Testing of hypothesis for large samples of few unknown statistical parameters.
- Testing of hypothesis for large samples of few unknown statistical parameters.
- Estimate relation between the functionally related data using method of least squares. Estimate correlation coefficient and coefficient of regression of the given data.

Course Outcomes:

After learning the contents of this the student must be able to:

- Apply the foundational principles of probability and discrete distributions to some case studies.
- Analyze continuous probability distributions, apply the normal distribution to real-world data.
- Apply the least squares method to fit data with linear, quadratic, and exponential curves, enabling accurate modeling of relationships and trends in data.
- Understand how to work with samples and populations, use different sampling methods, and calculate key measures like the sample mean, variance, and standard error to make accurate estimates about larger groups
- Examine statistical hypothesis for large samples.
- Examine statistical hypothesis for small samples.

UNIT – I

L - 10

Single Random Variable and Probability Distributions:

Random Variables: Discrete and Continuous, Discrete Probability distributions: Binomial and Poisson distributions and their properties. (Without proof)

Continuous Probability Distributions: Continuous random variables and their properties (without proof), distribution functions, Normal distribution.

UNIT – II

L - 9

Sampling Distribution: Definitions of population, sample, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of mean and sampling distribution of variance.

UNIT – III

L - 9

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors - critical region, confidence interval, Level of significance, one tailed test, two tailed test.

Large sample tests:

- i. Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)
- ii. Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

UNIT – IV

L - 10

Small sample tests: Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples. Snedecor's F-distribution and its properties. Test of equality of two population variances. Chi-square distribution, its properties, Chi-square test of goodness of fit.

UNIT – V

L - 10

Curve Fitting: Curve fitting by the method of least squares- fitting of straight line, parabola and exponential curves.

Correlation and Regression:

Correlation: Coefficient of correlation, Rank correlation (Karl Pearson's coefficient of correlation, Spearman's coefficient of correlation). Regression: Regression coefficient, lines of regression.

TEXT BOOKS:

1. Higher Engineering Mathematics by Dr. B.S Grewal, Khanna Publishers.
2. Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press.

REFERENCE BOOKS:

1. Mathematics for Engineers by K.B.Datta and M.S.Sriniva, Cengage Publications.
2. Fundamentals of Mathematical Statistics by S C Gupta and V.K. Kapoor.
3. Veerajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010.
4. P.G. Hoel, S.C.Port and C.J. Stone, Introduction to Probability theory, Universal Book Stall, 2003.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC01)SOFTWARE ENGINEERING**

B.Tech. IISem

**L T P C
3 0 0 3**

Course Objectives: The students will be able :

- To comprehend the various software process models.
- To understand the types of software requirements and SRS document.
- To know the different software design and architectural styles.
- To learn the software testing approaches and metrics used in software development.

Course Outcomes: Students will have the ability:

- **CO1:** Understand the role of software engineering and evaluate different software process models.
- **CO2:** Analyze and manage software requirements using UML and various system models.
- **CO3:** Design software architecture and user interfaces following best practices and object-oriented principles.
- **CO4:** Implement software testing strategies and use metrics to assess software quality.
- **CO5:** Identify and manage software risks through proactive and reactive strategies.
- **CO6:** Apply quality assurance techniques and industry standards to improve software processes.

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, Process patterns, process assessment. Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process, Agility and Agile Process model, Extreme Programming, Other process models of Agile Development and Tools

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

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, Architectural Design. Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

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. Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. 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, The Capability Maturity Model Integration (CMMI), Software reliability, The ISO 9000 quality standards.

TEXT BOOKS :

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

REFERENCE BOOKS :

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
4. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
5. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
6. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
7. Software Engineering 3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.
8. Introduction to Software Engineering, R. J. Leach, CRC Press. Course.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2405PC10) COMPUTER NETWORKS

B. Tech. II Year II Sem

L T P C
3 0 0 3

Course Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.

Course Outcomes:

At the end of course student will be able to-

- **CO1:** Understand data communication components, networks, protocols, and the OSI model, including transmission modes and switching techniques.
- **CO2:** Analyze data link layer functions such as framing, error detection, correction, and flow control, with an emphasis on protocols like HDLC and PPP.
- **CO3:** Understand network layer concepts, including logical addressing, routing protocols, and internetworking techniques like tunneling and address mapping.
- **CO4:** Evaluate transport layer protocols (UDP, TCP), congestion control mechanisms, and Quality of Service (QoS) techniques in network traffic management.
- **CO5:** Comprehend the application layer protocols, including DNS, email (SMTP), FTP, WWW, HTTP, and SNMP, with a focus on their practical usage.
- **CO6:** Apply security protocols such as PGP and SSH to enhance data communication and protect networked systems.

UNIT-I

Data Communications: Components – Direction of Data flow – Networks – Components and Categories– Types of Connections – Topologies– Protocols and Standards – ISO / OSI model, Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks and Virtual Circuit Networks.

UNIT-II

Data link layer: Introduction, Framing, and Error – Detection and Correction – Parity – LRC – CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. 111 Medium Access sub layer: ALOHA, CSMA/CD, LAN – Ethernet IEEE802.3, IEEE802.5 – IEEE802.11, Random access, Controlled access

UNIT-III

Network layer: Logical Addressing, Internet working, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.

UNIT–IV

Transport Layer: Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

UNIT– V

Application Layer: Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP, Security – PGP – SSH

TEXTBOOKS:

1. "Data Communications and Networking" by Forouzan
2. "Computer Networks" by Andrew S. Tanenbaum and David J. Wetherall
3. "Data Communications and Networking" by Grover and Sharma

REFERENCES:

1. "Computer Networks" by A. K. Singh
2. "Data Communications" by H. C. Sharma
3. "Networking Fundamentals" by A. K. Singh
4. "TCP/IP Protocol Suite" by Forouzan
5. "Network Security Essentials" by William Stallings
6. "Computer Networks and the Internet" by Douglas E. Comer

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC25) AUTOMATA THEORY AND COMPILER DESIGN

B.Tech. II Year IISem**L T P C**
3 1 0 4**Course Objectives**

- To introduce the fundamental concepts of formal languages, grammars and automata theory.
- To understand deterministic and non-deterministic machines and the differences between decidability and undecidability.
- Introduce the major concepts of language translation and compiler design and impart the knowledge of practical skills necessary for constructing a compiler.
- Topics include phases of compiler, parsing, syntax directed translation, type checking use of symbol tables, intermediate code generation

Course Outcomes

At the end of course student will be able to-

- Define and analyze nondeterministic and deterministic finite automata (NFA and DFA), their structures, language processing, and the conversion between NFA and DFA.
- Understand the relationship between finite automata and regular expressions, apply algebraic laws, and convert finite automata to regular expressions. Use the pumping lemma to prove properties of regular languages.
- Define pushdown automata (PDA) and Turing machines, and explore the equivalence of PDAs and context-free grammars (CFGs). Understand the concept of undecidability and the limits of computation with Turing machines.
- Learn the components of a compiler, focusing on lexical analysis (token recognition, input buffering) and syntax analysis (context-free grammars, parsing techniques, LR parsing).
- Understand syntax-directed definitions, translation schemes, and implement L-attributed SDDs. Analyze and apply evaluation orders for syntax-directed translation.
- Explore intermediate-code generation, the structure of syntax trees, three-address code, and manage runtime environments with stack allocation and heap management.

UNIT – I

Introduction to Finite Automata: Structural Representations, Automata and Complexity, the Central Concepts of Automata Theory – Alphabets, Strings, Languages, Problems. Nondeterministic Finite Automata: Formal Definition, an application, Text Search, Finite Automata with Epsilon-Transitions. Deterministic Finite Automata: Definition of DFA, How A DFA Process Strings, The language of DFA, Conversion of NFA with ϵ -transitions to NFA without ϵ -transitions. Conversion of NFA to DFA

UNIT - II

Regular Expressions: Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Conversion of Finite Automata to Regular Expressions. Pumping Lemma for Regular Languages: Statement of the pumping

lemma, Applications of the Pumping Lemma. Context-Free Grammars: Definition of Context-Free Grammars, Derivations Using a Grammar, Leftmost and Rightmost Derivations, the Language of a Grammar, Parse Trees, Ambiguity in Grammars and Languages.

UNIT - III

Push Down Automata: Definition of the Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Acceptance by final state Turing Machines: Introduction to Turing Machine, Formal Description, Instantaneous description, The language of a Turing machine Undecidability: Undecidability, A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines

UNIT - IV

Introduction: The structure of a compiler Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Recognition of Tokens, The Lexical- Analyzer Generator Lex Syntax Analysis: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom- Up Parsing, Introduction to LR Parsing: Simple LR, More Powerful LR Parsers

UNIT - V

Syntax-Directed Translation: Syntax-Directed Definitions, Evaluation Orders for SDD's, SyntaxDirected Translation Schemes, Implementing L-Attributed SDD's. Intermediate-Code Generation: Variants of Syntax Trees, Three-Address Code Run-Time Environments: Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management

TEXT BOOKS:

1. Introduction to Automata Theory, Languages, and Computation, 3rd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Theory of Computer Science- Automata languages and computation, Mishra and Chandrashekar, 2nd Edition, PHI.

REFERENCE BOOKS:

1. Compilers: Principles, Techniques and Tools, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, 2nd Edition, Pearson.
2. Introduction to Formal languages Automata Theory and Computation, Kamala Krithivasan, Rama R, Pearson.
3. Introduction to Languages and The Theory of Computation, John C Martin, TMH.
4. lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
5. Compiler Construction, Kenneth C. Loudon, Thomson. Course Technology.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2405PC02) OPERATING SYSTEMS****B.Tech. II Year IISem****LTPC****3 0 0 3****Course Objectives:**

Students will be able:

- To learn the mechanisms of OS to handle processes and threads and their communication
- To learn the mechanisms involved in memory management in contemporary OS
- To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols
- To know the components and management aspects of concurrency management

Course Outcomes:

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

- Analyze the architecture, services, and functionalities of various operating systems, including UNIX and Windows, as well as the concept of virtual machines.
- Understand and Analyze the concepts of processes and threads, including their definitions, relationships, states, and transitions, as well as the role of the Process Control Block (PCB) and context switching.
- Understand and Evaluate process scheduling foundations and algorithms, including their impact on CPU utilization and performance metrics such as throughput and response time.
- Analyze inter-process communication mechanisms and deadlock management strategies to understand critical sections, race conditions, and prevention techniques.
- Analyze memory management techniques, including allocation strategies, paging, and virtual memory concepts, to optimize performance and address fragmentation issues.
- Analyze I/O hardware management, file management systems, and disk management techniques to optimize performance and efficiency in operating systems.

UNIT - I:

Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System.

UNIT - II:

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching.

Thread: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads

Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time. Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR. Multiprocessor scheduling: Real Time scheduling: RM and EDF.

UNIT - III:

Inter-process Communication: Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer\Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dining Philosopher Problem etc.

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, and Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

UNIT - IV:

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition–Internal and External fragmentation and Compaction; Paging: Principle of operation – Page allocation – Hardware support for paging, Protection and sharing, Disadvantages of paging.

Virtual Memory: Basics of Virtual Memory – Hardware and control structures – Locality of reference, Page fault, Working Set, Dirty page/Dirty bit – Demand paging, Page Replacement algorithms: Optimal, First in First Out (FIFO), Second Chance (SC), Not recently used (NRU) and Least Recently used(LRU)

UNIT - V:

I/O Hardware: I/O devices, Device controllers, Direct memory access Principles of I/O Software: Goals of Interrupt handlers, Device drivers, Device independent I/O software, Secondary-Storage Structure: Disk structure, Disk scheduling algorithms

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free- space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN, Disk reliability, Disk formatting, Boot-block, Bad blocks

TEXT BOOKS:

- Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
- Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

REFERENCE BOOKS:

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J.Nutt, Addison-Wesley
3. Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India
Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2400HS05) DESIGN THINKING****B.Tech. II Year II Sem****L T P C****0021****Course Objectives:**

- Inculcate the fundamental concepts of design thinking
- Develop the students as a good designer by imparting creativity and problem solving ability
- Conceive, conceptualize, design and demonstrate innovative ideas using prototypes

Course Outcomes:

- CO1 Explain the principles of design thinking and its approaches
- CO2 Identify the empathy, define phases in human centered design problems.
- CO3 Develop an idea, build a prototype and test in design thinking context.
- CO4 Implement design thinking techniques for product innovation
- CO5 Use design thinking in business process models.
- CO6 Analyze the principles of design thinking and contrast them with engineering thinking to understand their distinct applications and importance.

Unit 1**INTRODUCTION TO DESIGN THINKING**

An insight into Design, origin of Design thinking, Design thinking Vs Engineering thinking, importance of Design thinking, Design Vs Design thinking, understanding Design thinking and its process models, application of Design thinking

Unit 2**EMPATHIZE IN DESIGN THINKING:**

Human-Centered Design (HCD) process - Empathize, Define, Ideate, Prototype and Test and Iterate. Role of Empathy in design thinking, methods and tools of empathy, understanding empathy tools. Explore define phase state users' needs and problems using empathy methods

.

Unit 3**IDEATION, PROTOTYPING AND TESTING:**

Ideation methods, brain storming, advantages of brain storming, methods and tools of ideations, prototyping and methods of prototyping, user testing methods, Advantages and disadvantages of user Testing/ Validation

Unit 4**PRODUCT INNOVATION:**

Design thinking for strategic innovation, Definition of innovation, art of innovation, teams for innovation, materials and innovation in materials, definition of product and its classification. Innovation towards product design Case studies

Unit 5**DESIGN THINKING IN BUSINESS PROCESSES:**

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business

– Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs.

Textbook(s)

- Tim Brown, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, HarperCollins Publishers Ltd.
- Idris Mootee, Design Thinking for Strategic Innovation, 2013, John Wiley & Sons Inc.

Reference(s)

- Brenda Laurel Design Research methods and perspectives MIT press 2003.
- Terwiesch, C. & Ulrich, K.T., 2009. Innovation Tournaments: creating and identifying Exceptional Opportunities, Harvard business press.
- Ulrich & Eppinger, Product Design and Development, 3rd Edition, McGraw Hill, 2004.
- Stuart Pugh, Total Design: Integrated Methods for Successful Product Engineering, Bjarki Hallgrímsson, Prototyping and model making for product design, 2012, Laurence King Publishing Ltd.
- Kevin Henry, Drawing for Product designers, 2012, Laurence King Publishing Ltd.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC61)SOFTWARE ENGINEERING & COMPUTER NETWORKS LAB

B.Tech. II Year II Sem.**L T P C****0 0 2 1.5****Course Objectives:**

- To have hands-on experience in developing a software project by using various software Engineering principles and methods in each of the phases of software development.
- To understand the working principle of various communication protocols.

Course Outcomes:

At the end of course student will be able to-

- Ability to translate end-user requirements into system and software requirements
- Ability to generate a high-level design of the system from the software requirements
- Implement data link layer framing methods
- Analyze error detection and error correction codes.
- Implement and analyze routing
- Address congestion issues in network design.

Software Engineering**List of Experiments:**

Do the following seven exercises for any two projects given in the list of sample projects or any other Projects:

1. Development of problem statements.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Preparation of Software Configuration Management and Risk Management related documents.
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Develop test cases for unit testing and integration testing
7. Develop test cases for various white box and black box testing techniques.

Sample Projects:

1. Passport automation System
2. Book Bank
3. Online Exam Registration

Computer Networks**List of Experiments:**

1. Implement the data link layer framing methods such as character, character-stuffing and bit stuffing.
2. Write a program to compute CRC code for the polynomials CRC-12, CRC-16 and CRC CCIP
3. Develop a simple data link layer that performs the flow control using the sliding window Protocol, and loss recovery using the Go-Back-N mechanism.
4. Implement Dijkstra's algorithm to compute the shortest path through a network
5. Take an example subnet of hosts and obtain a broadcast tree for the subnet.
6. Implement distance vector routing algorithm for obtaining routing tables at each node.
7. Implement data encryption and data decryption

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC62) OPERATING SYSTEMS LAB

B.Tech. II Year IISem

L T P C
0 0 2 1.5

Course Objectives:

- To understand the functionalities of various layers of OSI model
- To explain the difference between hardware, software; operating systems, programs and files.
- Identify the purpose of different software applications.

Course Outcomes:

At the end of the course the students are able to:

- Apply CPU scheduling algorithms to optimize system performance
- Implement file allocation and organization strategies to manage storage efficiently
- Develop programs to simulate contiguous memory allocation and page replacement techniques
- Apply Deadlock Avoidance and Prevention algorithms to ensure system reliability
- Develop programs to simulate disk scheduling and memory management algorithms
- Apply synchronization techniques to solve producer-consumer and dining-philosophers problems

Week 1: Simulate the following CPU scheduling algorithms.

a) Round Robin b) SJF c) FCFS d) Priority.

Week 2: Simulate all file allocation strategies

a) Sequential b) Indexed c) Linked.

Week 3: Simulate MVT and MFT.

Week 4: Write a C program to simulate the following contiguous memory allocation

Techniques a) Worst fit b) Best fit c) First fit.

Week 5: Simulate all File Organization Techniques

a) Single level directory b) Two level c) Hierarchical d) DAG.

Week 6: Simulate Bankers Algorithm for Dead Lock Avoidance.

Week 7: Simulate Bankers Algorithm for Dead Lock Prevention.

Week 8: Write a C program to simulate disk scheduling algorithms.

a) FCFS b) SCAN c) C-SCAN

Week 9: Simulate all page replacement algorithms

a) FIFO b) LRU c) LFU

Week 10: Simulate Paging Technique of memory management.

Week11: Write a C program to simulate producer-consumer problem using semaphores.

Week 12: Write a C program to simulate the concept of Dining-philosophers problem.

REFERENCE BOOKS:

1. An Introduction to Operating Systems, P.C.P Bhatt, 2nd edition, PHI.
2. Modern Operating Systems, Andrew S Tanenbaum, 3rd Edition ,PHI

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC04) INDIAN CONSTITUTION**

B.Tech. II Year II Sem

**L T P C
2 0 0 0**

Course Objective:

- To enable the students to be aware of emergence and evolution of Indian Constitution, to understand their fundamental rights and duties and to understand the structure and composition of Election Commission.

Course Outcome:

- Understand the meaning, importance, and evolution of the Indian Constitution and identify its salient features
- Describe the scheme of Fundamental Rights, Duties, and Directive Principles of State Policy, and analyze their legal and societal significance
- Illustrate the structure of the Union Government, including the roles and powers of the President, Prime Minister, and Parliament.
- Examine the historical perspective of constitutional amendments and evaluate the significance of emergency provisions in India.
- Analyze the constitutional framework for local self-government and assess its role in grassroots governance.
- Understand the functioning of the Election Commission, State Election Commissions, and welfare institutions for SC/ST/OBC and women.

UNIT –I

Meaning and Importance of Constitution, Evolution of the constitution of India. Salient features of the constitution of India

UNIT –II

Scheme of fundamental rights, fundamental duties and its legal status. The Directive Principles of State Policy- Significance and implementation

UNIT –III

Government of the Union : President of India – Election and Powers, Prime Minister and Council of Ministers, Lok Sabha – Composition and Powers, Rajya Sabha – Composition and Powers

UNIT –IV

The historical perspectives of the constitutional amendments in India. Emergency provisions: National Emergency, President Rule, Financial Emergency, Local self-government-

Constitutional scheme in India

UNIT –V

Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women.

TEXTBOOKS:

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.

REFERENCES:

1. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015
2. 'Indian Administration' by Avasti and Avasti.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC07) DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech. III Year I Sem.

L T P C

3 1 0 4

Course Objectives:

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.

Course Outcomes:

- Understand algorithm efficiency through time and space complexity analysis
- Use divide-and-conquer techniques for sorting and matrix multiplication
- Able to synthesize disjoint set operations and Understand Tree Traversal method
- Analyze Greedy Algorithms and Dynamic Programming concept to solve various problems
- Understand Backtracking, Branch and Bound concept to solve various problems.
- Recognize and classify NP-Hard and NP-Complete problems by analyzing non-deterministic algorithms, Cook's theorem, and complexity classes.

UNIT - I

Introduction: Algorithm definition, Algorithm Specification, Performance Analysis-Space complexity, Time complexity, probabilistic analysis Randomized Algorithms.

Divide and Conquer: General method, applications - Binary search, Merge sort, Quick sort, Strassen's Matrix Multiplication.

UNIT - II

Disjoint Set Operations: union and find algorithms, Efficient non-recursive binary tree traversal algorithms, spanning trees, graph traversals- BFS and DFS, AND/OR graphs, Game Tree, Connected Components and Spanning trees, Bi-connected components

UNIT - III

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

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

UNIT - IV

Backtracking: General method, applications - The 8-queen problem, sum of subsets problem, graph colouring, Hamiltonian cycles.

Branch and Bound: General Method, applications-0/1 Knapsack problem, LC Branch and Bound solution, travelling sales person problem.

UNIT - V

NP- Hard and NP-Complete Problems: Basic concepts, Non-deterministic algorithms, NP - Hard and NP- Complete classes, Cook's theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni and S.
2. Raja sekharan, Universities Press.
3. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, 2nd edition, Pearson Education.

REFERENCE BOOKS:

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
4. Foundations of Algorithms, R. Neapolitan and K. Naimipour, 4th edition, Jones and Bartlett Student edition.
5. Introduction to Algorithms, 3rd Edition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, PHI

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (2405PC12) DEVOPS

B.Tech. III Year I Sem.

LT P C

3 0 0 3

Course Objectives:

- The main objectives of this course are to:
- Describe the agile relationship between development and IT operations.
- Understand the skill sets and high-functioning teams involved in Devops and related methods to reach a continuous delivery capability.
- Implement automated system update and Devops lifecycle.

Course Outcomes:

On successful completion of this course, students will be able to:

- Identify components of Devops environment.
- Analyze Software development models and architectures of Devops.
- Apply different project management, integration, and testing and code deployment tool.
- Investigate different Devops Software development models.
- Assess various Devops practices.
- Collaborate and adopt Devops in real-time projects.

UNIT - I

Introduction: Agile development model, Devops, and ITIL. Devops process and Continuous Delivery, Release management, Scrum, Kanban, delivery pipeline, bottlenecks, examples

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, Git Lab.

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 automation: 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, Deployment tools: Chef, Salt Stack and Docker

TEXT BOOKS:

- Joakim Verona. Practical Devops, Second Edition. Ingram short title; 2nd edition (2018). ISBN10:1788392574 2.
- Deepak Gaikwad, Viral Thakkar. DevOps Tools from Practitioner's Viewpoint.
- Wiley publications. ISBN: 9788126579952

REFERENCE BOOK:

- Len Bass, Ingo Weber, Liming Zhu. DevOps: A Software Architect's Perspective. Addison Wesley; ISBN-10.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**Professional Elective – I
(2412PE01) MOBILE COMPUTING****B.Tech. III Year I Sem****L T P C
3 0 0 3****Course Objectives:**

- To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
- To understand the database issues in mobile environments & data delivery models.
- To understand the ad hoc networks and related concepts.
- To understand the platforms and protocols used in mobile environment.

Course Outcomes:

At the end of course student will be able to-

- Analyze the fundamental principles of wireless communication, including signal propagation, modulation techniques, and medium access control, to assess the challenges and limitations of mobile computing environments.
- Evaluate various telecommunication systems such as GSM, GPRS, UMTS, and satellite communication, comparing their architectures, protocols, and data services to determine their applicability in different scenarios.
- Design wireless LAN and mobile network configurations by applying knowledge of IEEE 802.11 standards, Bluetooth, and mobile IP protocols to address connectivity needs in infrastructure and ad-hoc networks.
- Develop optimized solutions for mobile transport layer protocols, such as TCP/IP, Mobile TCP, and Indirect TCP, to enhance reliability and data flow in mobile networks, considering specific protocol adaptations.
- Examine database management techniques, including hoarding, caching, and client-server adaptation, to resolve issues related to transaction processing, data recovery, and quality of service in mobile environments.
- Create mobile applications using platforms like Android, Symbian OS, and WAP 2.0 by integrating mobile file systems, web protocols, and platform-specific development tools, demonstrating proficiency in mobile application development.

UNIT I: Wireless Communication

Introduction - Frequencies and Regulations - Signals - Antennas - Propagation Ranges and Effects – Multipath Propagation - Effects of Mobility - Multiplexing - Modulation and Shift Keying - Spread Spectrum - Frequency Hopping and Direct Sequence- Medium Access Control– Specialized MAC –SDMF-FDMA-TDMA-CDMA- Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and

UNIT II: Telecommunication Systems

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT- - UMTS and IMT- 2000- Architecture, User Equipment, RNS, UTRAN, Node B, RNC functions - W- CDMA - HSPA+, HSUPA, HSDPA+ - Satellite systems – History- Applications- Basics- Routing- Localization- Handover-Examples

UNIT III: Wireless Lan and Mobile Network Layer

Wireless LAN -Infrared vs radio transmission - Infrastructure and ad-hoc network 205- IEEE 802.11-HIPER LAN-Bluetooth Mobile Network Layer- Mobile IP- Dynamic host configuration protocol- Mobile ad-hoc networks-

UNIT IV: Mobile Transport Layer & Database Issues

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Data Base Issues: Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Queryprocessing, Data Recovery Process & QoS Issues.

UNIT V: Mobile Application Development

File Systems- World wide web- Wireless application protocol (version 1.x)- i-mode- SyncML- WAP 2.0- Mobile Platform- Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

TEXT BOOKS:

1. JochenSchiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2009.
2. RajKamal, “Mobile Computing”, Oxford University Press, 2007, ISBN:0195686772.

REFERENCE BOOKS:

1. Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002, ISBN 0471419028.
2. Reza Behravanfar, “Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, Oct 2004

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
Professional Elective –I
(2405PE02) COMPUTER GRAPHICS & MULTIMEDIA

B.Tech. III Year I Sem

L T P C
3 0 0 3

Course Objectives:

The student should be made to:

- Understand the two dimensional and three-dimensional graphics and their transformations.
- Gain knowledge about graphics hardware devices and software used.
- Learn illumination and color models.
- Understand the three-dimensional graphics and their transformations.
- Learn clipping techniques.
- Understand Animation methodology

Course Outcomes:

At the end of course student will be able to-

- Recognize major applications and components of computer graphics, including display devices and input tools.
- Use algorithms to draw lines, circles, and ellipses, and apply various area-fill techniques for shape filling.
- Execute transformations such as translation, scaling, and rotation, and use clipping algorithms to display selected parts of objects within a view.
- Represent 3D shapes with polygons and curves, and apply transformations to create and modify 3D models.
- Apply surface detection techniques, including depth-buffer and back-face detection, to manage visible surfaces in a 3D scene.
- Create simple animations using key frame techniques and motion specifications for smooth transitions and effects.

UNIT I:

Introduction:

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

UNIT II:

2-D Geometrical transforms:

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

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view- port Coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping Algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT III:

3-D Object representation:

Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces. Basic illumination models, polygon viewing

coordinates, view volume and General projection transforms and clipping.

UNIT IV:**Visible surface detection methods:**

Classification, back-face detection, depth-buffer, scan-line, depth Sorting, BSP-tree methods, area sub-division and octree methods Illumination and Color Model: Light sources – basic illumination models – halftone patterns and dithering techniques; Properties of light – Standard primaries and chromaticity diagram; Intuitive colour Concepts – RGB colour model – YIQ colour model – CMY colour model – HSV colour HLS colour model; Colour selection.

UNIT V:**Computer animation:**

Design of animation sequence, general computer animation functions, raster Animation, computer animation languages, key frame systems, motion specifications

TEXTBOOKS:

1. “Computer Graphics C version”, Donald Hearn and M. Pauline Baker, Pearson education.
2. “Computer Graphics Principles & practice”, second edition in C, Foley, Van Dam, Feiner and Hughes, Pearson Education.

REFERENCE BOOKS:

1. “Computer Graphics Second edition”, Zhigandxiang, Roy Plastock, Schaum’s outlines, Tata Mc Graw hill edition.
2. “Procedural elements for Computer Graphics”, David F Rogers, Tata Mc Graw hill, 2nd edition.
3. “Principles of Interactive Computer Graphics”, Neuman and Sproul, TMH.
4. “Principles of Computer Graphics”, Shalini, Govil-Pai, Springer

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PE01) OBJECT ORIENTED ANALYSIS AND DESIGN
PROFESSIONAL ELECTIVE-I**

B.Tech. III Year I Sem

L T P C

3 0 0 3

Course Objectives:

- Concisely define the following key terms: class, object, state, behavior, object class, class diagram, object diagram, operation, encapsulation, constructor operation, query operation, update operation, scope operation, association, association role, multiplicity, association class, abstract class, concrete class, class-scope attribute, abstract operation, method, polymorphic, overriding, multiple classification, aggregation, and composition.
- Analyze the activities in the different phases of the object-oriented development life cycle. State the advantages of object-oriented modeling vis-a-vis structured approaches. Compare and contrast the object-oriented model with the E-R and EER models.
- Model a real-world application by using a UML class diagram.
- Provide a snapshot of the detailed state of a system at a point in time using a UML (Unified Modeling Language) object diagram.
- Recognize when to use generalization, aggregation and composition relationships. Specify different types of business rules in a class diagram.

Course Outcomes:

- Graduate can able to take up the case studies and model in it. Different views with respect user requirement such as use case, logical, component and deployment and etc, and preparation of document of the project for the unified Library application.
- Demonstrate a solid understanding of object-oriented concepts and design patterns.
- Construct UML diagrams for effective system modeling and architecture.
- Develop NLP-based tools to automate requirements gathering and analysis.
- Implement LLM-driven solutions for code generation, documentation, and design validation.
- Assess the impact of AI on software engineering practices

UNIT I:

Introduction to UML: Importance of modeling, Principles of modeling, Object oriented modeling, Conceptual model of the UML, Architecture, Software Development Life cycle.

UNIT II:

Basic Structural Modeling: Classes, Relationships, Common Mechanisms and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

Class and Object Diagrams: Terms Concepts, Modeling techniques for Class and 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.

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

UNIT V:

Patterns and frameworks, Artifact Diagrams, Case Study: The Unified Library application.

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-DreamtechIndiaPvt.Ltd

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
PROFESSIONAL ELECTIVE –I
(2462PE16)CYBER SECURITY ESSENTIALS

B.Tech. III Year I Sem

L T P C
3 0 0 3

Course Objectives:

- Understand the field of digital security and concepts of access control mechanism.
- To introduce keywords and jargons involved in securing browser.
- Understanding network basic and familiarize on security of network protocols.
- Awareness and understanding on cyber-attacks and data privacy.

Course Outcomes:

- Analyze and evaluate the cyber security needs of an organization.
- Understand Cyber Security Regulations and Roles of International Law.
- Design and develop a security architecture for an organization.
- Understand fundamental concepts of data privacy attacks.
- Evaluate the effectiveness of different cyber security strategies and defenses in real-world
- Analyze potential threats and vulnerabilities within a system or network, identifying areas of weakness that may be exploited.

UNIT- I:

Basics of digital security, protecting personal computers and devices, protecting devices from Virus and Malware, Identity, Authentication and Authorization, need for strong credentials, keeping credentials secure, protecting servers using physical and logical security.

UNIT- II:

World Wide: Web (www), the Internet and the HTTP protocol, security of browser to web server interaction.

UNIT- III:

Networking basics (home network and large-scale business networks), Networking protocols, Security of protocols, sample application hosted on-premises.

UNIT- IV:

Introduction to cyber-attacks, application security (design, development and testing), operations security, monitoring, identifying threats and remediating them.

UNIT- V:

Principles of data security - Confidentiality, Integrity and Availability, Data Privacy, Data breaches, preventing attacks and breaches with security controls, Compliance standards, Computer Ethics.

TEXTBOOKS:

Sammons, John, and Michael Cross. The basics of cyber safety: computer and mobile device safety made easy. Elsevier, 2016.

REFERENCES:

1. Charles P. P fleeger, Shari Lawrence, P fleeger Jonathan Margulies; Security in Computing, Pearson Education Inc . 5th Edition, 2015
2. Brooks, Charles J., Christopher Grow, Philip Craig, and Donald Short. Cyber security essentials. John Wiley & Sons, 2018

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(PROFESSIONAL ELECTIVE - I)
(2467PE02)DISTRIBUTED SYSTEMS

III Year B.Tech. IT I –Sem

L T P C
3 0 0 3

Prerequisites

- A course on “Operating Systems”
- A course on “Computer Organization & Architecture”

Course Objectives

- This course provides an insight into Distributed systems.
- Topics include- Peer to Peer Systems, Transactions and Concurrency control, Security and Distributed shared memory

Course Outcomes

At the end of course student will be able to-

- Understand the characteristics and models of distributed systems, including system architecture, interprocess communication, and remote object invocation mechanisms.
- Analyze the operating system support needed for distributed computing, including process management, communication, and distributed file system design.
- Demonstrate understanding of peer-to-peer architectures, global state synchronization, and coordination techniques such as mutual exclusion and consensus.
- Evaluate and apply concurrency control techniques, manage distributed transactions, and handle deadlocks and recovery in distributed environments.
- Understand and implement replication strategies and fault-tolerant services using group communication and consistency models.
- Assess the design trade-offs in distributed shared memory systems and propose appropriate consistency mechanisms for maintaining system coherence.

UNIT - I

Characterization of Distributed Systems-Introduction, Examples of Distributed systems, Resource sharing and web, challenges, System models -Introduction, Architectural and Fundamental models, Networking and Internetworking, Interprocess Communication, Distributed objects and Remote Invocation-Introduction, Communication between distributed objects, RPC, Events and notifications, Case study-Java RMI.

UNIT – II

Operating System Support- Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture, Distributed File Systems-Introduction, File Service architecture.

UNIT – III

Peer to Peer Systems–Introduction, Napster and its legacy, Peer to Peer middleware, Routing overlays, Overlay case studies-Pastry, Tapestry, Application case studies-Squirrel, OceanStore. Time and Global States-Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global states, distributed debugging. Coordination and Agreement-Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

UNIT – IV

Transactions and Concurrency Control-Introduction, Transactions, Nested Transactions, Locks, and Optimistic concurrency control, Timestamp ordering. Distributed Transactions-Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

UNIT - V

Replication-Introduction, System model and group communication, Fault tolerant services, Transactions with replicated data. Distributed shared memory, Design and Implementation issues, and Consistency models.

TEXT BOOKS:

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education.
2. Distributed Systems, S.Ghosh, Chapman & Hall/CRC, Taylor & Francis Group, 2010.

REFERENCE BOOKS:

1. Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.
2. Distributed Computing, Principles, Algorithms and Systems, Ajay D. Kshemakalyani and Mukesh Singhal, Cambridge, rp 2010

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2467PE06)TEXT ANALYTICS**

PROFESSIONAL ELECTIVE-I

B.Tech. IV Year I Sem

L T P C

3 0 0 3

Course Objectives:

- To introduce the foundational concepts and techniques in Natural Language Processing, including text preprocessing, feature extraction, and machine learning for text data.
- To develop practical skills in building, evaluating, and deploying real-world NLP applications using Python-based tools and libraries.

Course Outcomes:

At the end of course student will be able to-

- **Understand** the fundamental concepts of Natural Language Processing (NLP) and text analytics.
- **Apply** various text preprocessing techniques for data cleaning and normalization.
- **Implement** word embeddings and vectorization techniques to represent text data.
- **Analyze** text classification, sentiment analysis, and topic modeling algorithms.
- **Evaluate** advanced NLP techniques like Named Entity Recognition (NER) and Part-of-Speech (POS) tagging.
- **Design** and deploy end-to-end text analytics solutions for real-world applications.

UNIT I:

Overview of Natural Language Processing and its Applications, Challenges in NLP and Text Analytics, Basic Text Processing Pipeline, Regular Expressions and Pattern Matching
Tokenization, Stemming, Lemmatization, and Stop word Removal

UNIT II:

Bag of Words and TF-IDF Models, Word Embeddings: Word2Vec, GloVe, FastText
Sentence and Document Embeddings, Dimensionality Reduction Techniques, Similarity Measures for Text Data

UNIT III:

Supervised Learning for Text Classification (Naïve Bayes, SVM, Logistic Regression), Evaluation Metrics: Precision, Recall, F1 Score, ROC Curve, Unsupervised Learning: K-Means, Hierarchical Clustering, Sentiment Analysis and Opinion Mining, Implementation Using Python Libraries: Scikit-learn, NLTK, spaCy

UNIT IV:

Named Entity Recognition (NER), Part-of-Speech (POS) Tagging, Syntactic and Semantic Parsing, Topic Modeling: Latent Dirichlet Allocation (LDA) and Non-Negative Matrix Factorization (NMF), Word Sense Disambiguation

UNIT V:

Information Extraction and Retrieval, Text Summarization and Question Answering Systems, Chat bots and Virtual Assistants, Real-world Case Studies in Text Analytics, End-to-End Project Design and Deployment

TEXTBOOKS:

1. "Speech and Language Processing" by Daniel Jurafsky and James H. Martin, 3rd Edition, Pearson.
2. "Natural Language Processing with Python" by Steven Bird, Ewan Klein, and Edward Loper, O'Reilly Media.
3. "Deep Learning for Natural Language Processing" by Palash Goyal, Sumit Pandey, Karan Jain, Apress.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
PROFESSIONAL ELECTIVE – II
(2405PE05) SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

III Year B. Tech I SEM

L T P C
3 0 0 3

Course Objectives:

- To understand the concept of patterns and the Catalog.
- To discuss the Presentation tier design patterns and their effect on: sessions, client access, validation and consistency.
- To understand the variety of implemented bad practices related to the Business and Integration tiers.
- To highlight the evolution of patterns.

Course Outcomes:

At the end of course student will be able to-

- Understand key concepts in software architecture, including architectural patterns, styles, views, and the architecture business cycle.
- Design and document software architectures that address quality attributes and stakeholder needs using appropriate architectural structures and patterns.
- Evaluate software architectures using techniques such as ATAM and CBAM to support decision-making and trade-off analysis.
- Understand the use of software product lines and component-based development in building systems at scale.
- Apply creational and structural design patterns to solve common software design problems efficiently and consistently.
- Implement behavioral design patterns and analyze real-world case studies to understand architectural decisions in various software systems.

UNIT – I

Envisioning Architecture the Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views. Creating an Architecture Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT - II

Analyzing Architectures Architecture Evaluation, Architecture design decision making, ATAM, and CBAM.

UNIT - III

Moving from one system to many Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT - IV

Patterns **Pattern** Description, organizing catalogs, role in solving design problems, Selection and usage. Creational and Structural patterns Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight, Proxy

UNIT – V

Behavioral patterns Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor. Case Studies A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

TEXT BOOKS:

1. Software Architecture in Practice, second edition, Len Bass, Pau Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS:

1. Beyond Software architecture, Luke Hohmann, Addison Wesley, 2003.
2. Software architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE07) COMPUTER VISION
(PROFESSIONAL ELECTIVE – II)

B.Tech. III Year I SEM

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Course Objectives:

- Understand computer vision concepts ,Apply computer vision techniques for image processing tasks
- Develop new algorithms to solve computer vision problems
- Understand the ethical implications of large datasets

Course Outcomes:

At the end of course student will be able to-

- Demonstrate on the concepts underlying computer vision, its history, and applications, and describe basic graphic techniques such as image filtering and rendering
- Explore image recognition and filtering techniques such as edge, corner, and blob detection, and compare them with annotations such as SIFT, SURF, and ORB.
- Make use of feature recognition and classification techniques using algorithms such as template matching, SVM, Random Forest, and CNNs to classify and recognize features in images
- Review techniques for visual sensitivity, image segmentation, and object segmentation techniques to distinguish objects in complex images, such as through depth estimation and clustering
- Design and implement deep learning models for computer vision tasks by utilizing CNNs and transfer learning to solve specific problems in classification, detection, and segmentation.
- Assess the role of advanced computer vision and deep learning techniques, exploring current architectures and evaluating their effectiveness in various real-world applications.

UNIT I:

Introduction to Computer Vision

-Definition and scope of computer vision, History and evolution of computer vision, Applications and importance of computer vision, Overview of computer vision pipeline ,Image representation (pixels, bit depth, etc.), Image filtering (blur, threshold, etc.)

UNIT II

Image Features and Descriptors, Edge detection (Canny, Sobel, etc.), Corner detection (Harris, Shi-Tomasi, etc.), Blob detection (SIFT, SURF, etc.), Descriptor extraction (SIFT, SURF, ORB, etc.), Feature matching and tracking, Image feature extraction techniques

UNIT III

Object Recognition and Classification, Introduction to machine learning in computer vision, Object recognition techniques (template matching, feature matching, etc.), Classification algorithms (SVM, Random Forest, CNN, etc.), Object detection techniques (R-CNN, YOLO, SSD, etc.), Image classification techniques

UNIT IV

Scene Understanding and Segmentation, Scene understanding techniques (depth estimation, optical flow, etc.), Image segmentation techniques (trees holding, clustering, etc.),

Object segmentation techniques, Scene parsing and understanding, Image restoration and enhancement

UNIT V

Deep Learning in Computer Vision, Introduction to deep learning (CNN, RNN, etc.), Applications of deep learning in computer vision (image classification, object detection, segmentation, etc.), Convolutional Neural Networks (CNNs) for computer vision, Transfer learning and fine-tuning, Deep learning architectures for computer vision tasks

REFERENCE BOOKS:

- Computer Vision: Algorithms and Applications by Richard Szeliski
- Computer Vision: Models, Learning, and Inference by Simon Prince
- Computer Vision: A Modern Approach by David Forsyth and Jean Ponce
- Introductory Techniques for 3-D Computer Vision by Emanuele Trucco and Alessandro Verri
- Multiple View Geometry in Computer Vision by Richard Hartley and Andrew Zisserman
- Practical Deep Learning for Cloud, Mobile & Edge by Siddha Ganju, Meher Kasam, and Anirudh Koul
- Concise Computer Vision: An Introduction to Theory and Algorithms by unknown author
- Computer Vision: Principles, Algorithms, Applications, Learning by unknown author
- Deep Learning for Vision Systems by unknown author
- Modern Computer Vision with Pytorch by unknown author

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE13) DEEP LEARNING TECHNIQUES
PROFESSIONAL ELECTIVE-II**

B.Tech. III Year I SEM

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Course Objectives:

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

- understand complexity of Deep Learning algorithms and their limitations
- understand modern notions in data analysis oriented computing;
- Be capable of confidently applying common Deep Learning algorithms in practice and implementing their own;
- Be capable of performing distributed computations; be capable of performing experiments in Deep Learning using real-world data.

Course Outcomes:

- Understand the concepts of Tensor Flow, its main functions, operations and the execution pipeline
- Implement deep learning algorithms, understand neural networks and traverse the layers of data abstraction which will empower the student to understand data more precisely.
- Learn topics such as convolutional neural networks, recurrent neural networks, training deep networks and high-level interfaces
- Build deep learning models in Tensor Flow and interpret the results
- Understand the language and fundamental concepts of artificial neural networks
- Troubleshoot and improve deep learning models

UNIT 1:

Introduction to Tensor Flow: Computational Graph, Key highlights, Creating a Graph, Regression example, Gradient Descent, Tensor Board, Modularity, Sharing Variables, Keras Perceptrons: What is a Perceptron, XOR Gate

UNIT 2:

Activation Functions :Sigmoid, ReLU, Hyperbolic Fns, Soft max Artificial Neural Networks : Introduction, Perceptron Training Rule, Gradient Descent Rule

UNIT 3:

Gradient Descent and Back propagation: Gradient Descent, Stochastic Gradient Descent, Back propagation, Some problems in ANN Optimization and Regularization :Over fitting and Capacity, Cross Validation, Feature Selection, Regularization, Hyper parameters

UNIT 4:

Introduction to Convolutional Neural Networks: Introduction to CNNs, Kernel filter ,Principles behind CNNs, Multiple Filters, CNN applications.

Introduction to Recurrent Neural Networks: Introduction to RNNs, Unfolded RNNs,Seq2Seq RNNs, LSTM, RNN applications

UNIT 5:

Deep Learning applications: Image Processing, Natural Language Processing, Speech Recognition, Video Analytics

TEXT BOOK

1. Goodfellow, I., Bengio, Y., and Courville, A., Deep Learning, MIT Press, 2016.

REFERENCES

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 Van Loan,C.,F., Matrix Computations, JHU Press,2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata McGraw-Hill Education,2004.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE02) SOFTWARE REQUIREMENTS AND ESTIMATIONS**

B.Tech. III Year I SEM

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Course Objectives:

1. Learn the importance and scope of software requirements.
2. Understand the concepts of Requirements elicitation & Requirements modeling
3. Gain knowledge of principles and practices of Requirements Management.
4. Understand the process and methods of software estimation and size estimation.
5. Learn about Effort, Schedule and Cost Estimation techniques.

Course Outcomes:

- **Understand** the importance and principles of software requirements and their role in successful project outcomes.
- **Apply** various elicitation, analysis, and modeling techniques to define high-quality software requirements.
- **Evaluate** and manage changing requirements using effective tools and traceability techniques.
- **Estimate** software size using established sizing methods like Function Point Analysis and Mark II FPA.
- **Analyze** effort, cost, and schedule using models such as COCOMO II, Putnam, and algorithmic approaches.
- **Utilize** software estimation and requirements management tools to support planning and development accuracy.

UNIT-I

Software Requirements: What and Why Essential Software requirement, good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

UNIT- II

Software Requirements Engineering Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality, Software Requirements Modeling- Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frame

UNIT-III

Software Requirements Management Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber-RM, implementing requirements management automation,

UNIT- IV

Software Estimation Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation. Size Estimation-Two views of sizing, Function Point Analysis, MarkII FPA, Full Function Point

UNIT -V

Effort, Schedule and Cost Estimation What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation Software Estimation Tools: Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (Software Life Cycle Management) Tools

TEXT BOOKS:

1. Software Requirements and Estimation by Rajesh Naik and Swapna Kishore, Tata Mc Graw Hill

REFERENCES:

1. Software Requirements by Karl E. Weigers, Microsoft Press.
2. Managing Software Requirements, Dean Leffingwell & Don Widrig, Pearson Education, 2003.
3. Estimating Software Costs, Second edition, Capers Jones, Tata McGraw-Hill, 2007.
4. Practical Software Estimation, M.A. Parthasarathy, Pearson Education, 2007.

MALLAREDDY ENGINEERING COLLEGE FOR WOMEN
(2405PE06) DISTRIBUTED COMPUTING
(PROFESSIONAL ELECTIVE – II)

B.Tech. III Year I Sem.

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Course Objectives:

- To introduce the computation and communication models of distributed systems
- To illustrate the issues of synchronization and collection of information in distributed systems
- To describe distributed mutual exclusion and distributed deadlock detection techniques
- To elucidate agreement protocols and fault tolerance mechanisms in distributed systems
- To explain the cloud computing models and the underlying concepts

Course Outcomes:

Upon the completion of this course, the student will be able to

- Understand the foundational concepts of distributed systems, including architectures, communication models, and execution paradigms.
- Apply logical and physical time synchronization techniques, message ordering schemes, and global state recording in distributed systems.
- Analyze and implement distributed mutual exclusion algorithms and deadlock detection techniques in various system models.
- Evaluate consensus and agreement protocols under different system conditions and implement recovery strategies using checkpointing.
- Understand the principles of cloud computing, including deployment models, service models, and key cloud technologies such as virtualization and load balancing.
- Design and integrate distributed systems and cloud computing components for scalable, fault-tolerant, and elastic applications.

UNIT I:

Introduction: Definition-Relation to Computer System Components – Motivation – Message - Passing Systems versus Shared Memory Systems – Primitives for Distributed Communication – Synchronous versus Asynchronous Executions – Design Issues and Challenges; A Model of Distributed Computations: A Distributed Program – A Model of Distributed Executions – Models of Communication Networks – Global State of a Distributed System.

UNIT II:

Logical Time: Physical Clock Synchronization: NTP – A Framework for a System of Logical Clocks Scalar Time – Vector Time; Message Ordering and Group Communication: Message Ordering Paradigms – Asynchronous Execution with Synchronous Communication –

Synchronous Program Order on Asynchronous System – Group Communication – Causal Order – Total Order; Global State and Snapshot Recording Algorithms: Introduction – System Model and Definitions – Snapshot Algorithms for FIFO Channels

UNIT III:

Distributed Mutual exclusion Algorithms: Introduction – Preliminaries – Lamport's algorithm – RicartAgrawala's Algorithm — Token-Based Algorithms – Suzuki-Kasami's Broadcast Algorithm; Deadlock Detection in Distributed Systems: Introduction – System Model – Preliminaries – Models of Deadlocks – Chandy-Misra-Haas Algorithm for the AND model and OR Model.

UNIT IV:

Consensus and Agreement Algorithms: Problem Definition – Overview of Results – Agreement in a Failure-Free System(Synchronous and Asynchronous) – Agreement in Synchronous Systems with Failures; Checkpointing and Rollback Recovery: Introduction – Background and Definitions – Issues in Failure Recovery – Checkpoint-based Recovery – Coordinated Checkpointing Algorithm Algorithm for Asynchronous Checkpointing and Recovery

UNIT V:

CLOUD COMPUTING Definition of Cloud Computing – Characteristics of Cloud – Cloud Deployment Models – Cloud Service Models – Driving Factors and Challenges of Cloud – Virtualization – Load Balancing – Scalability and Elasticity – Replication – Monitoring – Cloud Services and Platforms: Compute Services – Storage Services – Application Services.

TEXTBOOKS:

1. "Distributed Systems: Concepts and Design" by George C. Fenny
2. "Distributed Systems: Principles and Paradigms" by Andrew S. Tanenbaum and Maarten van Steen
3. "Distributed Computing: Principles, Algorithms, and Systems" by Ajay D. Kshemkalyani and Mukesh Singhal

REFERENCE BOOKS:

1. "Distributed Systems" by S. K. Sharma
2. "Distributed Computing" by S. K. Singh
3. "Cloud Computing: Principles, Systems and Applications" by P. Krishna et a

MALLAREDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE02) DATA WAREHOUSING AND DATA MINING
PROFESSIONAL ELECTIVE –II

B.Tech. III Year I SEM

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Course Objectives:

- Study data warehouse principles and its working learn data mining concepts.
- To understand association rules mining.
- Discuss classification algorithms.
- Learn how data is grouped using clustering techniques.

Course Outcomes:

- Understand the architecture, components, and schema designs of data warehouses, and differentiate them from operational database systems.
- Apply OLAP operations and analyze different OLAP server architectures such as ROLAP, MOLAP, and HOLAP.
- Analyze the functionalities and types of data mining systems, and perform data preprocessing techniques like cleaning, integration, transformation, and reduction.
- Implement association rule mining techniques using algorithms such as Apriori and FP-Growth, and analyze different types of frequent itemsets.
- Develop and evaluate classification models using algorithms like Decision Trees, Naïve Bayes, and K-Nearest Neighbors, along with ensemble methods and performance metrics.
- Perform cluster analysis using various clustering methods such as partitioning, hierarchical, density-based, grid-based, and model-based approaches, and conduct outlier analysis.

UNIT-I

Data Warehouse: Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction- Transformation-Loading, Logical(Multi- Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact- Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture- ROLAP, MOLAP and HOLAP.

UNIT-II

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of aData Mining System with a Database or Data Warehouse System, Major issues in DataMining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration &Transformation, Data Reduction, Discretization and Concept HierarchyGeneration.

UNIT-III

Association Rules: Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIORI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set-

Maximal Frequent Item Set, Closed Frequent Item Set.

UNIT-IV

Classification: Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers, Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics. Prediction: Accuracy and Error measures. Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

UNIT-V

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, and Model based Clustering Methods, Outlier Analysis.

TEXT BOOKS:

- 1) Data Mining- Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2nd Edition, 2006.
- 2) Introduction to Data Mining, Pang-Ning Tan, Vipin Kumar, Michael Steinbach, Pearson Educator.

REFERENCE BOOKS:

- 1) Data Mining Techniques, Arun K Pujari, 3rd Edition, Universities Press.
- 2) Data Warehousing Fundamentals, P. Raj Ponnaiyah, Wiley Student Edition.
- 3) The Data Warehouse Life Cycle Toolkit — Ralph Kimball, Wiley Student Edition.
- 4) Data Mining, Vikram Pudi, P. R. Krishna, Oxford University Press

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC66) DESIGN AND ANALYSIS OF ALGORITHMS LAB

B.Tech. III Year I SEM

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Course Objectives:

- To write programs in java to solve problems using divide and conquer strategy.
- To write programs in java to solve problems using backtracking strategy.
- To write programs in java to solve problems using greedy and dynamic programming techniques.

Course Outcomes:

- Divide and Conquer, Greedy, Dynamic programming, and Backtracking.
- Implementing and analyzing Quick Sort and Merge Sort in Java.
- Students will apply graph traversal techniques by implementing DFS and BFS algorithms to explore graph structures.
- Students will apply backtracking techniques to solve complex problems (NQueens, Sum of Subsets, and Hamiltonian Circuits) and analyze the efficiency of these solutions.
- Students will apply the greedy approach to implement job sequencing algorithms and analyze their performance and optimality.
- Students will apply and analyze the implementation of Dijkstra's, Kruskal's and Prim's algorithms and Floyd's algorithms to determine shortest paths in graphs.

List of Experiment

1. Write a java program to implement Quick sort algorithm for sorting a list of integers in ascending order
2. Write a java program to implement Merge sort algorithm for sorting a list of integers in ascending order.
3. Write a java program to implement the dfs algorithm for a graph.
4. Write a. java program to implement the bfs algorithm for a graph.
5. Write a java programs to implement backtracking algorithm for the N-queens problem.
6. Write a java programs implement the backtracking algorithm for the sum of subsets problem.
7. Write a java program to implement the backtracking algorithm for the Hamiltonian Circuits problem.
8. Write a java programs implement greedy algorithm for job sequencing with deadlines.
9. Write a java programs implement Dijkstra's algorithm for the Single source shortest path problem.
10. Write a java program that implements Prim's algorithm to generate minimum cost spanning tree.
11. Write a java program that implements Kruskal's algorithm to generate minimum cost spanning tree

12. Write a java program to implement Floyd's algorithm for the all pairs shortest path problem.
13. Write a java program to implement Dynamic Programming algorithm for the 0/1 Knapsack problem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni and S. Rajasekharan, Universities Press.
2. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, 2nd edition, Pearson Education.
3. Java: The Complete Reference, Eleventh Edition, 11th Edition by Herbert Schildt
Publisher(s): McGraw-Hill

REFERENCE BOOKS:

1. Levitin A, "Introduction to the Design And Analysis of Algorithms", Pearson Education, 2008.
2. Goodrich M.T., R Tomassia, "Algorithm Design foundations Analysis and Internet Examples", John Wiley and Sons, 2006.
3. Base Sara, Allen Van Gelder, "Computer Algorithms Introduction to Design and Analysis", Pearson, 3rd Edition, 1999

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC65) DEVOPS LAB**

B.Tech. III Year I Sem

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Course Objectives:

1. Describe the agile relationship between development and IT operations.
2. Understand the skill sets and high-functioning teams involved in
3. DevOps and related methods to reach a continuous delivery capability
4. Implement automated system update and DevOps lifecycle.

Course Outcomes:

1. Identify components of Devops environment
2. Apply different project management, integration, testing and code deployment tool
3. Investigate different DevOps Software development, models
4. Demonstrate continuous integration and development using Jenkins.
5. Use different project management and integration tools.
6. Select an appropriate testing tool and deployment model for projec

List of Experiments:

1. Write code for a simple user registration form for an event.
2. Explore Git and GitHub commands.
3. Practice Source code management on GitHub. Experiment with the source code in exercise 1.
4. Jenkins installation and setup, explore the environment.
5. Demonstrate continuous integration and development using Jenkins.
6. Explore Docker commands for content management.
7. Develop a simple containerized application using Docker.
8. Integrate Kubernetes and Docker
9. Automate the process of running containerized application for exercise 7 using Kubernetes.
10. Install and Explore Selenium for automated testing.
11. Write a simple program in JavaScript and perform testing using Selenium.
12. Develop test cases for the above containerized application using selenium.

TEXT BOOKS:

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

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC05) TECHNICAL COMMUNICATIONS AND SOFT SKILLS

B.Tech. III Year I SEM

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Course Objectives:

- To make the students recognize the role of Technical English in their academic and professional fields.
- To improve language proficiency and develop the required professional skills.
- To equip students with tools to organize, comprehend, draft short and long forms of technical work.

Course Outcomes:

At the end of course student will be able to-

- The students will be able to understand information which assists in completion of the assigned job tasks more successfully.
- Students will also be able to adhere to ethical norms of scientific communication.
- Students will be able to strengthen their individual and collaborative work strategies
- The students will be able to understand information which assists in completion of the assigned job tasks more successfully.
- Students will also be able to adhere to ethical norms of scientific communication
- Students will be able to strengthen their individual and collaborative work strategies

Introduction:

Technical Communication and Soft skills focuses on enhancing students' communication. A thorough drill in grammar exercises is given. Various technical writing styles and skills are developed. The future placement needs of the students are met by giving them an exposure to group discussions and mock interviews.

The students hone these skills under the guidance of instructor whose constant evaluation helps in the professional development. This course fulfills the need of the aspirants in acquiring and improving the skills required for placements and professional success.

UNIT I – Personal Evaluation

Self-Assessment and Self- Awareness - Self-Esteem - Perception and Attitudes -Values and Beliefs - Time Management- Concord

UNIT 2 - Professional Communication

Extempore - Oral Presentations – Presentation Aids- Email Writing, Business Letter Writing

- Memo Writing - Transformation of Sentences

UNIT 3 – Career Planning

Group Discussion, Interviews - Leadership Skills & Team Building - Personal Goal Setting And Career Planning - Complex Problem Solving - Creativity - Role and Responsibilities of an Engineer - Tenses

UNIT 4 - Technical Writing

Principles of Effective Writing - Editing Strategies to Achieve Appropriate Technical Style – Technical Report Writing – Voice

UNIT 5 - Ethics and Responsibilities

Personality Development in Social and Office Settings – Netiquettes - Work Culture and Cubicle Etiquettes - Correction of Sentences

TEXT BOOKS:

1. JDavid F. Beer and David Mc Murrey, Guide to writing as an Engineer, JohnWiley. New York,2004
2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)
3. Shiv Khera, You Can Win, Macmillan Books, New York, 2003.

REFERENCES:

1. Raman Sharma, Technical Communications, Oxford Publication, London, 2004.
2. Meenakshi Raman, Prakash Singh, Business communication, Oxford Publication, New Delhi2012.
3. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004.(ISBN: 07828357-4)
4. Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi2002.
5. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN0402213)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2400HS02)PROFESSIONAL ENGLISH****B.Tech. III Year II SEM****L T P C****3 0 0 3****INTRODUCTION:**

English is a tool for global communication and is the dominant language which is sweeping almost all the fields in the world. It has become a necessity for people to speak in English comfortably, if they want to enter the global workforce. Hence, the course is designed to help the students to meet the global standards. Each unit focuses on English skill-set to improve: Interview skills, giving presentations and professional etiquette.

Course Objectives:

1. To enrich students to express themselves appropriately and fluently in professional contexts.
2. To enhance their employability through regular participation in group discussions and interview skills.
3. To lay foundation with writing strategies for the future workplace needs.
4. To acquaint students with different components of professional presentation skills.
5. To equip students with necessary training in listening to comprehend dialects of English language.

Course Outcomes:

Students will be able to:

1. Draft coherent and unified paragraphs with adequate supporting details.
2. Demonstrate problem solving skills, decision-making skills, analytical skills.
3. Comprehend and apply the pre-interview preparation techniques for successful interview.
4. Achieve expertise in writing resume and cover letter formats.
5. Understand and apply the structured process of writing technical and academic reports, including organization, clarity, and coherence.
6. Demonstrate the ability to write concise and effective abstracts that accurately summarize the key points of a document or study.

UNIT I- FOCUS ON LANGUAGE

Parts of speech - nominal compounds, noun phrases - relative pronoun - adjective - numerical, comparison and contrast, collocation and word combinations - verb - preposition and relative - conjunction- connectives, expressions of purpose and function, cause and effect- articles - adjectives - sentence pattern - tenses - voice - rewriting the sentences in impersonal/abbreviated passive grammatical structures - concord - sentence level verb noun agreement - gerund - rewriting infinitive into gerund - imperative - rewriting imperative into recommendation using should - word formation - varied grammatical function of the same word - affixes – prefix and suffix, number prefix, negative prefix - reported speech - editing strategies - conditional

structures - real, unreal, no possibility, zero condition. Writing formal definition - abbreviation and acronym - idioms and phrases varieties of English – British versus American

UNIT II -LISTENING SKILLS

Comprehension practice - vocabulary development - familiarity to varied types of spoken English and accents - developing ability to understand audio and video media - aiming at overcoming barriers to listening - listening to documentaries, radio news broadcasts, TV news telecasts - active listening in discussions and to lectures - taking notes while listening - extracting information from listening.

UNIT III -SPEAKING SKILLS

Oral practice - role play - interplay - seminar – trans coding visual into oral - participating in short and longer conversation - voice record, replay, correction of intonation, pronunciation and flow of speech - phonemes - vowels, consonants, stress, rhythm, intonation - group discussion - participative learning - acquiring proficiency, fluency, accuracy in oral communication - speaking practice - developing confidence - extempore speech - learning professional/conversational etiquette – Oral presentation skills.

UNIT IV- READING SKILLS

Vocabulary extension - improving vocabulary - intensive reading - reading strategies - identifying topic sentence - guessing meaning from content - picking out specific information - professional reading - reading practice - predicting the content, critical and analytical reading - reading articles in English newspapers, sports magazines, encyclopedias - reading aloud, use of stress and intonation - reading and comprehending technical materials - cloze reading.

UNIT V- WRITING SKILLS

Discourse cohesion - improving writing skills, avoiding common grammatical errors in academic writing - extending the hints - writing shorter sentences - punctuation - dialogue writing - paragraph writing, problems and solutions, achieving coherence, transition words, sequence words - essays of descriptive and argumentative - writing instructions, use of imperatives - jumbled sentences into sequential paragraph using linguistic clues - report writing - technical reports, industry visit reports, events reports - writing recommendations - letter writing - formal and informal letters, e-mail writing - job application and resume, permission for in-plant training, business correspondence letters, calling for quotation, placing order, lodging complaint, persuasive letters - assignment writing - mini-project – telephonic etiquette-transcoding - transferring of information from text to pictorial/graphical representation and vice versa.

TEXT BOOKS:

1. Practical English Usage. Michael Swan. OUP.1995.
2. Remedial English Grammar. F.T. Wood.Macmillan.2007
3. On Writing Well. William Zinsser. Harper Resource Book.2001

REFERENCE BOOKS:

1. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press.2006.
2. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press.2011.
3. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PC02) MACHINE LEARNING**

B.Tech. III Year II Sem

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Course Objective:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.

Course outcomes:

At the end of the course students should be able to

- Ideate various learning models (geometric, probabilistic, logic) and analyze key concepts like generalization, error, bias, and variance in learning processes.
- Apply linear and nonlinear classification techniques (e.g., logistic regression, perceptrons, and support vector machines) and assess model performance considering generalization and overfitting.
- Implement and evaluate distance-based models (e.g., k-means clustering, k-nearest neighbours, hierarchical clustering) and advanced techniques such as ensemble learning (e.g., bagging, boosting).
- Construct and analyze decision trees and rule-based models for classification, regression, and association rule mining, understanding their use in predictive and descriptive modeling.
- Develop algorithms for passive and active reinforcement learning (e.g., temporal-difference learning, policy search), and evaluate their application in real-world scenarios like game playing and robotics.
- Examine and apply the principles of model validation and regularization in various learning techniques to mitigate overfitting and enhance model reliability.

UNIT I

FOUNDATIONS OF LEARNING

Components of learning – learning models – geometric models – probabilistic models – logic models – grouping and grading – learning versus design – types of learning – supervised – unsupervised – reinforcement – theory of learning – feasibility of learning – error and noise – training versus testing – theory of generalization – generalization bound – approximation – generalization tradeoff – bias and variance – learning curve

UNIT II

INTRODUCTION TO TECHNOLOGY LANDSCAPE

Linear classification – univariate linear regression – multivariate linear regression – regularized

regression – Logistic regression – perceptron's – multilayer neural networks – learning neural networks structures – support vector machines – soft margin SVM – going beyond linearity– generalization and overfitting – regularization – validation.

UNIT III

DISTANCE-BASED MODELS

Nearest neighbor models – K-means – clustering around medoids – silhouettes – hierarchical clustering – k-d trees – locality sensitive hashing – non-parametric regression – ensemble learning – bagging and random forests – boosting – meta learning

UNIT IV

TREE AND RULE MODELS

Decision trees – learning decision trees – ranking and probability estimation trees – regression trees – clustering trees – learning ordered rule lists – learning unordered rule lists– descriptive rule learning – association rule mining – first-order rule learning

UNIT V

REINFORCEMENT LEARNING

Passive reinforcement learning – direct utility estimation – adaptive dynamic programming– temporal-difference learning – active reinforcement learning – exploration – learning an action utility function – Generalization in reinforcement learning – policy search – applications in game playing – applications in robot control.

TEXT BOOKS:

1. P. Flach, “Machine Learning: The art and science of algorithms that make sense of data”, Cambridge University Press, 2012. (UNIT-I to IV)
2. M. Mohri, A. Rostamizadeh, and A. Talwalkar, “Foundations of Machine Learning”, MIT Press, 2012. (UNITV)

REFERENCE BOOKS:

1. Y. S. Abu-Mostafa, M. Magdon-Ismail, and H.-T. Lin, “Learning from Data”, AMLBook Publishers,2012.
2. K. P. Murphy, “Machine Learning: Aprobabilistic perspective”, MIT Press,2012.
3. C. M. Bishop, “Pattern Recognition and Machine Learning”, Springer,2007.
4. T. M. Mitchell, “Machine Learning”, McGraw Hill,1997.
5. S. Russel and P. Norvig, “Artificial Intelligence: A Modern Approach”, Third Edition, Prentice Hall,2009.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2412PC03) FULL STACK DEVELOPMENT****B.Tech. III Year II Sem****L T P C**
3 0 0 3**COURSE OBJECTIVES:**

1. To become knowledgeable about the most recent web development technologies.
2. Idea for creating two tier and three tier architectural web applications.
3. Design and Analyze real time web applications and Constructing suitable client and server side applications.
4. To learn core concept of both front end and back end programming.
5. Students will become familiar to implement fast, efficient, interactive and scalable web applications using run time environment provided by the full stack components.

COURSE OUTCOMES:

At the end of course student will be able to-

1. Gain foundational knowledge of web development concepts and tools, including HTML, CSS, and web servers.
2. Acquire a deep understanding of JavaScript, focusing on object-oriented programming (OOP), memory management, and functions.
3. Gain expertise in creating Angular components, using data binding, and applying built-in and custom directives.
4. Develop proficiency in creating React components, handling data flow, and managing component lifecycle methods.
5. Understand the fundamentals of Node.js, including its event-driven architecture and non-blocking I/O model.
6. Learn to integrate Mongo DB with Node.js and Explore advanced MongoDB concepts for scaling and optimizing database operations.

UNIT - I

Web Development Basics: MVC architecture, understanding different stacks, HTML-Basic Structure, Tags, Tables, Frames, Forms, Entities, and CSS.

Frontend Development: JavaScript basics OOPS, Selectors, Event Handlers, DOM, Exceptions, Objects

UNIT - II

Node js: Getting Started with Node.js, Using Events, Listeners, Timers, and Callbacks in Node.js, Handling Data I/O in Node.js, Accessing the File System from Node.js, Implementing Socket Services in Node.js.

UNIT - III

Angular: Importance of Angular, Understanding Angular, creating a Basic Angular Application, Angular Components, Expressions, Data Binding, Built-in Directives, Custom Directives, Implementing Angular Services in Web Applications.

UNIT - IV**React:**

Need of React, Simple React Structure, The Virtual DOM, React Components, Introducing React Components, Creating Components in React, Data and Data Flow in React, Rendering and Life Cycle Methods in React, Working with forms in React, integrating third party libraries, Routing in React.

UNIT - V**MongoDB:**

Understanding NoSQL and MongoDB, Getting Started with MongoDB, Getting Started with MongoDB and Node.js, Manipulating MongoDB Documents from Node.js.

TEXT BOOKS:

1. Web Design with HTML, CSS, JavaScript and JQuery Set Book by Jon Duckett Professional JavaScript for Web Developers Book by Nicholas C. Zakas. (Unit-I,II).
2. ProGit, 2nd Edition, Apress publication by Scott Chacon and Straub. (Unit I).
3. Brad Dayley, Brendan Dayley, Caleb Dayley., Node.js, MongoDB and Angular Web Development, 2nd Edition, AddisonWesley, 2019. (Unit-III, Unit-IV, Unit-V).
4. Mark Tielens Thomas, React in Action, 1st Edition, Manning Publications. (Unit-III).

REFERENCE BOOKS:

1. Full-Stack JavaScript Development by Eric Bush.
2. Mastering Full Stack React Web Development Paperback – April 28, 2017 by Tomasz Dyl , Kamil Przeorski , Maciej Czarnecki.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE04) SOFTWARE METRICS**B.Tech. III Year II Sem****L T P C**
3 0 0 3**COURSE OBJECTIVES:**

1. To introduce the principles and importance of measurement in software engineering, including foundational theories, models, and scale types.
2. To equip students with the knowledge and techniques to classify, collect, validate, and apply software metrics for measuring internal and external product attributes.
3. To develop the ability to plan measurement programs, apply metrics in practice, and analyze customer satisfaction through empirical research and data interpretation.

COURSE OUTCOMES:

At the end of course student will be able to-

1. Understand the role and significance of measurement in software engineering and apply foundational measurement theories and models.
2. Classify software measures and apply measurement frameworks effectively, ensuring validity in data collection and processing.
3. Measure internal product attributes such as software size and structure using appropriate metrics and techniques.
4. Model and measure external product attributes, particularly software quality, and evaluate its various aspects.
5. Plan and manage a software measurement program and understand how to integrate metrics into practical project environments.
6. Analyze customer satisfaction through empirical research methods and interpret survey data to assess software product and service quality.

UNIT-I

Measurement: Measurement in Everyday Life, Measurement in Software Engineering, Scope of Software Metrics. Frame Basics of Measurement: Representational Theory of Measurement, Measurement and Models, Measurement Scales and Scale Types.

UNIT-II

Work for Software Measurement: Classifying Software Measures, Applying Frame Work, Software Measurement Validation. Software Methods in Data Collection: Good Data, Definition of Data, Collecting, Storing and Extracting Data.

UNIT-III

Measuring Internal Product Attributes: Measuring Size and Structure. Measuring External Product Attributes: Modeling Software Quality, Measuring Aspects of Quality.

UNIT-IV

Measurement and Management: Planning a Measurement Program, Measurement in Practice.

UNIT-V

Customer Satisfaction: Empirical Research in Software Engineering, Measuring and Analyzing Customer Satisfaction: Customer Satisfaction Surveys, Analyzing Satisfaction Data, Satisfaction with Company.

Text Books:

1. Fenton, Pfleeger, Software Metrics, A Rigorous and Practical Approach, 2nd Edition, Thomson, 1998.
2. Stephen H. Kan, Metrics & Models in Software Quality Engineering, 2nd Edition, Addison-weseley Pearson Education, 2002.

References:

1. Sheppard, Software Engineering Metrics, 1st Edition, Mc GrawHill Publications, 1994.
2. Pertis et al, Software Metrics, An Analysis and Evaluation, 1st Edition, MIT Press, 1981.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE05) MOBILE APPLICATION AND API DEVELOPMENT

B.Tech. III Year II Sem

L T P C
3 0 0 3

Course Objectives

- To introduce students to mobile operating systems, development environments, and application architectures for Android and cross-platform ecosystems.
- To provide hands-on experience in designing interactive and responsive user interfaces using layouts, views, and Jetpack components.
- To enable students to handle data management using local storage options such as Shared Preferences and SQLite.
- To teach the principles of RESTful API development and integration into Android applications using tools and libraries like Retrofit and Volley.
- To explore advanced mobile features such as background services, location-based services, Firebase integration, and app deployment processes.
- To familiarize students with cross-platform development frameworks, version control systems, mobile performance tuning, and secure coding practices.

Course Outcomes

At the end of course student will be able to-

- Understand and differentiate between native, hybrid, and web apps, and set up the Android development environment using Android Studio.
- Design effective user interfaces using Android layouts, views, and RecyclerViews, and handle user interactions through event handling and notifications.
- Implement local data storage techniques in Android using Shared Preferences and SQLite databases.
- Integrate RESTful APIs into Android applications, parse JSON data, and apply secure authentication techniques such as JWT and OAuth.
- Develop mobile apps with advanced features like background services, location tracking, Firebase integration, and publish them to the Play Store.
- Compare native and cross-platform mobile development tools, use Git for version control, and apply best practices for mobile performance and secure coding.

UNIT I:

Introduction to Mobile Application Development: Mobile ecosystems: Android, iOS, cross-platform tools, Native vs Hybrid vs Web apps, Android Studio setup and architecture, Application components: Activities, Services, Broadcast Receivers, Content Providers, Android Manifest, Gradle, Activity lifecycle and intents

UNIT II:

User Interface Design and Data Management: Layouts (Linear, Relative, Constraint), Views and ViewGroups, Event Handling and Notifications, RecyclerView, CardView, SharedPreferences and SQLite, Jetpack Components (Intro only)

UNIT III:

API Development and Integration: Restful API concepts (GET, POST, PUT, DELETE), API design principles and tools (Postman, Swagger), Backend development using Flask/Django/Node.js (overview), JSON parsing and Retrofit/Volley in Android, Authentication and authorization (JWT/OAuth basics)

UNIT IV:

Advanced Features and App Deployment: Background tasks and services, Location-based services and Google Maps API, Sensors and permissions, Firebase integration (Auth, Realtime DB, Push Notifications), Publishing to Google Play Store (steps, requirements)

UNIT V:

Cross-platform & Industry Practices: Introduction to React Native / Flutter, Comparative study of native vs cross-platform, Code versioning using Git and GitHub, Mobile app performance optimization, Secure coding and privacy best practices

Text Books:

1. Professional Android by Reto Meier
2. Learning React Native by Bonnie Eisenman
3. Flask Web Development by Miguel Grinberg

Reference Books:

- Android Programming: The Big Nerd Ranch Guide by Bill Phillips
- Online Docs: developer.android.com, flutter.dev

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE06)INTERNET OF THINGS
PROFESSIONAL ELECTIVE –III

III Year B. Tech II Sem

L T P C
3 0 0 3

Course Objectives

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web-based services on IoT devices

Course Outcomes

At the end of course student will be able to-

- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication.
- Elaborate the need for Data Analytics and Security in IoT.
- Illustrate different sensor technologies for sensing real world entities and identify the
- Applications of IoT in Industry.

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 NETOPEER

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 Webserver – Web server for IoT, Cloud for IoT, Python web application framework Designing a RESTful web API

TEXT BOOK

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2462PE25)SOCIAL MEDIA SECURITY**

B.Tech. III Year II Sem

**L T P C
3 0 0 3**

Course Objectives:

- Understand the fundamentals of social media security and privacy
- Identify and explain types of social media threats and attacks
- Analyze and evaluate social media security features and policies
- Develop and implement secure social media practices
- Investigate and analyze social media security incidents
- Design and develop a social media security awareness program
- Understand legal and ethical implications of social media security

Course Outcomes:

At the end of course student will be able to-

- Understand the security risks and threats associated with social media
- Identify and analyze potential security vulnerabilities in social media platforms
- Develop strategies for mitigating cyber threats and attacks on social media
- Implement best practices for social media security and privacy
- Conduct social media forensic analysis and investigation
- Design and implement a social media security plan for individuals and organizations

UNIT-I

Introduction to Social Media Security, Overview of social media platforms and their security concerns, Types of threats and attacks on social media, Importance of social media security, Basic security measures for social media accounts

UNIT –II

Social Media Platforms and Their Security Features, Security features of popular social media platforms (Facebook, Twitter, Instagram, etc.), Privacy settings and data protection policies, Authentication and authorization mechanisms, Vulnerabilities and limitations of social media platforms

UNIT –III

Threats and Attacks on Social Media, Types of attacks (phishing, spear phishing, malware, etc.), Social engineering tactics, Identity theft and online harassment, Cyberbullying and online hate speech

UNIT –IV

Security Measures and Best Practices, Password management and two-factor authentication, Encryption and secure communication, Safe browsing habits and avoiding online scams, Regular updates and patch management

UNIT –V

Advanced Social Media Security Topics, Social media forensics and investigation, Social media monitoring and analytics, Advanced threat detection and mitigation, Ethical hacking and penetration testing for social media

Text books:

1. "Social Media Security: Leveraging Social Networking While Mitigating Risk" by Michael Cross
2. "Social Media: A Reference Handbook: A Reference Handbook" by Kelli S. Burns

Reference books:

1. "The Routledge Handbook of Privacy and Social Media" by Sabine Trepte and Philipp Masur
2. "Social Media and Security" by SpringerLink
3. "Data Privacy, Social Media, Surveillance: 13 Best Books for You" by George Orwell

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE04) DISTRIBUTED DATABASES
PROFESSIONAL ELECTIVE –III**

B.Tech. III Year II SEM

**L T P C
3 0 0 3**

Prerequisites:

1. A course on “Database Management Systems”

Course Objectives:

- The purpose of the course is to enrich the previous knowledge of database systems and exposing the need for distributed database technology to confront with the deficiencies of the centralized database systems.
- Introduce basic principles and implementation techniques of distributed database systems.

Course Outcomes:

At the end of course student will be able to-

- Understand theoretical and practical aspects of distributed database systems.
- Study and identify various issues related to the development of distributed database system.
- Understand the design aspects of object-oriented database system and related development.
- Equip students with principles and knowledge of parallel and object-oriented databases.
- Topics include distributed DBMS architecture and design; query processing and optimization;
- Distributed transaction management and reliability; parallel and object database management systems.

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, object query 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

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE03) INFORMATION RETRIEVAL SYSTEMS
PROFESSIONAL ELECTIVE –III**

B.Tech. III Year II SEM

**L T P C
3 0 0 3**

Prerequisites:

1. Data Structures

Course Objectives:

- To learn the important concepts and algorithms in IRS
- To understand the data/file structures that are necessary to design, and implement information retrieval (IR) systems.

Course Outcomes:

At the end of course student will be able to-

- Apply Information Retrieval (IR) principles and techniques to locate relevant information efficiently in large and unstructured data collections.
- Design and implement different document clustering algorithms to organize, categorize, and retrieve information from large datasets effectively.
- Implement retrieval systems tailored to web search tasks, optimizing indexing, ranking, and relevance of search results.
- Design an efficient Information Retrieval System for web search tasks, focusing on system architecture, indexing techniques, and retrieval algorithms for improved performance.
- Evaluate the effectiveness of retrieval systems using performance metrics such as precision, recall, and F1-score, and apply techniques to optimize these metrics in real-world search engines.
- Integrate advanced techniques, such as natural language processing and machine learning, into Information Retrieval systems to enhance the accuracy and relevance of web search results.

UNIT – I:

Introduction to Information Retrieval Systems: Definition of Information Retrieval System, Objectives of Information Retrieval Systems, Functional Overview, Relationship to Database Management Systems, Digital Libraries and Data Warehouses Information Retrieval System Capabilities: Search Capabilities, Browse Capabilities, Miscellaneous Capabilities

UNIT – II:

Cataloging and Indexing: History and Objectives of Indexing, Indexing Process, Automatic Indexing, Information Extraction Data Structure: Introduction to Data Structure, Stemming Algorithms, Inverted File Structure, N-Gram Data Structures, PAT Data Structure, Signature File Structure, Hypertext and XML Data Structures, Hidden Markov Models

UNIT – III:

Automatic Indexing: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages Document and Term Clustering: Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters

UNIT – IV:

User Search Techniques: Search Statements and Binding, Similarity Measures and Ranking, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches of Boolean

Systems, Searching the INTERNET and Hypertext Information Visualization: Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies.

UNIT – V:

Text Search Algorithms: Introduction to Text Search Techniques, Software Text Search Algorithms, Hardware Text Search Systems Multimedia Information Retrieval: Spoken Language Audio Retrieval, Non-Speech Audio Retrieval, Graph Retrieval, Imagery Retrieval, Video Retrieval.

TEXT BOOK:

1. Information Storage and Retrieval Systems – Theory and Implementation, Second Edition, Gerald J. Kowalski, Mark T. Maybury, Springer

REFERENCE BOOKS:

1. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
2. Information Storage & Retrieval By Robert Korfhage – John Wiley & Sons.
3. Modern Information Retrieval By Yates and Neto Pearson Education.

**MALLAREDDY ENGINEERING COLLEGE FOR WOMEN
(2466PC62) MACHINE LEARNING LAB**

B.Tech. III Year II Sem

**L P T C
0 0 3 1.5**

Course Objectives:

- The objective of this lab is to get an overview of the various machine learning
- This lab is to learn the machine learning techniques and can able to demonstrate those using python.

Course Outcomes:

After the completion of the “**Machine Learning**” lab, the student can able to:

- Apply Bayes' theorem to calculate conditional probabilities, implementing probabilistic reasoning in Python to solve classification and decision-making tasks.
- Extract and analyze structured data from databases using Python, preparing datasets for machine learning applications to enable effective data-driven insights.
- Develop predictive models using k-nearest neighbors (KNN) and k-means clustering, and assess the classification of new data points based on proximity and clustering outcomes.
- Evaluate the performance of different machine learning algorithms, including linear regression and Naïve Bayes, in predicting outcomes and classifying data, demonstrating an understanding of model accuracy and bias.
- Design and implement a genetic algorithm, showcasing optimization techniques by exploring solutions to complex problems through simulated evolution and natural selection.
- Construct and train a neural network for text classification using a back-propagation algorithm, effectively categorizing finite words and improving classification accuracy through iterative learning.

List of Experiments

1. The probability that it is Friday and that a student is absent is 3 %. Since there are 5 school days in a week, the probability that it is Friday is 20 %. What is the probability that a student is absent given that today is Friday? Apply Baye's rule in python to get the result. (Ans:15%)
2. Extract the data from database using python
3. Implement k-nearest neighbours classification using python
4. Given the following data, which specify classifications for nine combinations of VAR1 and VAR2 predict a classification for a case where VAR1=0.906 and VAR2=0.606, using the result of k-means clustering with 3 means (i.e., 3 centroids)

VAR1	VAR2	CLASS
1.713	1.586	0
0.180	1.786	1
0.353	1.240	1

0.940	1.566	0
1.486	0.759	1
1.266	1.106	0
1.540	0.419	1
0.459	1.799	1
0.773	0.186	1

5. The following training examples map descriptions of individuals onto high, medium and low credit-worthiness. Medium skiing design single twenties no -> high Risk high golf trading married forties yes -> low Risk low speed way transport married thirties yes -> med Risk medium football banking single thirties yes -> low Risk highflying media married fifties yes -> high Risk low football security single twenties no -> med Risk medium golf media single thirties yes -> med Risk medium golf transport married forties yes -> low Risk high skiing banking single thirties yes -> high Risk low go l fun employed married forties yes -> high Risk Input attributes are (from left to right) income, recreation, job, status, age-group, home-owner. Find the unconditional probability of `golf' and the conditional probability of `single' given `med Risk' in the dataset?
6. Implement linear regression using python.
7. Implement Naïve Bayes theorem to classify the English text
8. Implement an algorithm to demonstrate the significance of genetic algorithm
9. Implement the finite words classification system using Back-propagation algorithm

Text Books:

1. Machine Learning – Tom M. Mitchell, MGH
2. Fundamentals of Speech Recognition By Lawrence Rabiner and Biing – Hwang Juang.

Reference Book:

1. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC64)FULL STACK DEVELOPMENT LAB**

B.Tech. III Year II Sem

**L P T C
0 0 3 1.5**

Course Objectives:

1. Usage of various front and backend Tools.
2. Understand and create applications.
3. Demonstrate and Designing of Websites can be carried out.
4. Develop web based application using suitable client side and server side code.
5. Implement web based application using effective database access.

Course outcomes:

At the end of course student will be able to-

1. Understand and apply the foundational principles of web design to create static, user-friendly interfaces. Develop skills in structuring content using HTML.
2. Gain hands-on experience in using CSS to enhance the aesthetics and responsiveness of a webpage. Learn to apply styles dynamically to improve user experience.
3. Acquire knowledge of DOM manipulation and event handling in JavaScript. Enhance interactive capabilities of web pages by responding to user actions.
4. Learn how to use jQuery for client-side validation. Develop a system that evaluates password strength to improve security awareness.
5. Understand asynchronous communication between the client and server. Learn to fetch and display data without refreshing the webpage, improving user experience.
6. Gain proficiency in building dynamic single-page applications (SPAs).

List of Programs

1. Designing following static WebPages required for an Online Book Store website.
 - 1) HOME PAGE
 - 2) LOGIN PAGE
 - 3) CATALOGUE PAGE: The catalogue page should contain the details of all the books available in the web site in a table. The details contain the following:
 - a. Snap shot of Cover Page. b. Author Name. c. Publisher. d. Price. e. Add to cart button.
 - 4) CART PAGE:
 - a. The cart page contains the details about the books which are added to the cart.
 - b. The cart page should look like this:
 - 5) REGISTRATION PAGE: “registration form “with the following fields
 - 1) Name (Text field) 2) Password (password field) 3) E-mail id (text field) 4) Phone number (text field)
 - 5) Sex (radio button) 6) Date of birth (3 select boxes) 7) Languages known (check boxes – English, Telugu, Hindi, Tamil) 8) Address (text area)

2. Designing a webpage using CSS Which includes different styles.
- 3 .Write a JavaScript to implement the following various events.
a) Mouse b) Keyboard c) Form d) Window
- 4 .Write a program to create and Build a Password Strength Check using JavaScript
- 5 .Write a program using string function and operators in JavaScript..
6. Write a program for sending request to a server by using Angular.
- 7 .Develop an Angular application that displays a list of shopping items. Allow users to add and remove items from the list using directives and controllers.
8. Write a program to create a simple calculator Application using React JS.
- 9 .Write a program to create a voting application using React JS.
10. Write a server side program for Accessing MongoDB from Node.js.
- 11 .Write a server side program for Manipulating MongoDB from Node.js.

TEXT BOOKS:

1. Web Design with HTML, CSS, JavaScript and JQuery Set Book by Jon Duckett Professional JavaScript for Web Developers Book by Nicholas C. Zakas. (Unit-I,II).
2. ProGit, 2nd Edition, Apress publication by Scott Chacon and Straub. (Unit I).
3. Brad Dayley, Brendan Dayley, Caleb Dayley., Node.js, MongoDB and Angular Web Development, 2nd Edition, AddisonWesley, 2019. (Unit-III, Unit-IV, Unit-V).
4. Mark Tielens Thomas, React in Action, 1st Edition, Manning Publications. (Unit-III).

REFERENCE BOOKS:

1. Full-Stack JavaScript Development by Eric Bush.
2. Mastering Full Stack React Web Development Paperback – April 28, 2017 by Tomasz Dyl , Kamil Przeorski , Maciej Czarnecki

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC06) INDIAN TRADITIONAL KNOWLEDGE**

B.Tech. III Year II Sem

L P T C

2 0 0 0

Course Objectives:

To facilitate the students with the concepts of Indian traditional knowledge and to make them understand the Importance of roots of knowledge system.

Course Outcomes:

After completion of the course, students will be able to:

- Understand the concept of Traditional knowledge and its importance
- Know the need and importance of protecting traditional knowledge.
- Know the various enactments related to the protection of traditional knowledge.
- Understand the concepts of Intellectual property to protect the traditional knowledge.

UNIT I: Introduction to traditional knowledge:

Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge

UNIT II: Protection of traditional knowledge:

the need for protecting traditional knowledge Significance of TK Protection, value of TK in global economy, Role of Government to harness TK.

UNIT III: Legal frame work and TK:

A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act);
B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016. Geographical indicators act 2003.

UNIT IV: Traditional knowledge and intellectual property:

Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

UNIT V: Traditional knowledge in different sectors:

Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of

conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK.

Text Books :

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and Vipin Kumar Singh, Pratibha Prakashan 2012.

Reference Books:

1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002
2. "Knowledge Traditions and Practices of India" Kapil Kapoor¹, Michel Danino²

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400HS07) ORGANIZATIONAL BEHAVIOUR**

B.Tech. IV Year I Sem

**L P T C
3 0 0 2**

Course Objectives:

The objective of the course is to provide the students with the conceptual framework and the theories underlying Organizational Behaviour.

Course Outcomes:

After completion of the course, students will be able to:

- To introduce the fundamental concepts, nature, and scope of Organizational Behaviour in the context of modern organizations.
- To analyze communication processes, decision-making techniques, and the effects of stress and conflict within organizational settings.
- To examine power dynamics, group behaviour, team effectiveness, and workplace politics in organizational environments.
- To understand leadership styles, motivation strategies, and behavioural management approaches for enhancing performance.
- To understand leadership styles, motivation strategies, and behavioural management approaches for enhancing performance.

UNIT- I: Introduction to OB - Definition, Nature and Scope – Environmental and organizational context – Impact of IT, globalization, Diversity, Ethics, culture, reward systems and organizational design on Organizational Behaviour. Cognitive Processes-I: Perception and Attribution: Nature and importance of Perception – Perceptual selectivity and organization – Social perception – Attribution Theories – Locus of control – Attribution Errors – Impression Management.

UNIT-II: Cognitive Processes-II: Personality and Attitudes – Personality as a continuum – Meaning of personality - Johari Window and Transactional Analysis - Nature and Dimension of Attitudes – Job satisfaction and organizational commitment-Motivational needs and processes- Work-Motivation Approaches Theories of Motivation- Motivation across cultures - Positive organizational behaviour: Optimism – Emotional intelligence – Self-Efficacy.

UNIT- III: Dynamics of OB-I: Communication – types – interactive communication in organizations – barriers to communication and strategies to improve the follow of communication - Decision Making: Participative decision-making techniques – creativity and group decision making. Dynamics of OB –II Stress and Conflict: Meaning and types of stress –Meaning and types of conflict - Effect of stress and intraindividual conflict - strategies to cope with stress and conflict.

UNIT- IV: Dynamics of OB –III Power and Politics: Meaning and types of power – empowerment - Groups Vs. Teams – Nature of groups – dynamics of informal groups – dysfunctions of groups and teams – teams in modern work place.

UNIT- V: Leading High performance: Job design and Goal setting for High performance- Quality of Work Life Socio technical Design and High-performance work practices - Behavioural performance management: reinforcement and punishment as principles of Learning –Process of Behavioural modification - Leadership theories - Styles, Activities and skills of Great leaders.

TEXT BOOKS:

1. Luthans, Fred: Organizational Behaviour 10/e, McGraw-Hill, 2009
2. McShane: Organizational Behaviour, 3e, TMH, 2008
3. Nelson: Organizational Behaviour, 3/e, Thomson, 2008.

REFERENCE BOOKS:

1. Newstrom W. John & Davis Keith, Organisational Behaviour-- Human Behaviour at Work, 12/e, TMH, New Delhi, 2009.
2. Pierce and Gardner: Management and Organisational Behaviour: An Integrated perspective, Thomson, 2009.
3. Robbins, P. Stephen, Timothy A. Judge: Organisational Behaviour, 12/e, PHI/Pearson, New Delhi, 2009.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC05) CRYPTOGRAPHY AND NETWORK SECURITY**

B.Tech. IV Year I Sem

**L T P C
3 0 0 3**

Course Objective

- The course provides an overview of the various encryption techniques, how to use them to protect the data.

Course Outcome:

At the end of course student will be able to-

- Understand the evolution of cryptography and apply classical encryption techniques such as substitution and transposition ciphers.
- Analyze the structure and functioning of block ciphers and stream ciphers, and understand mathematical foundations like fields, polynomials, and finite arithmetic.
- Apply advanced symmetric and asymmetric encryption algorithms including AES, RSA, ECC, and explain secure key exchange mechanisms.
- Understand the design, requirements, and security of cryptographic hash functions and apply standard algorithms like SHA and SHA-3.
- Demonstrate knowledge of blockchain fundamentals including Bitcoin, smart contracts, and distributed consensus algorithms.
- Evaluate blockchain platforms such as Ethereum and identify potential applications in real-world decentralized systems.

UNIT I

History and overview of cryptography, Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Rotor Machines, And Steganography.

UNIT II

Stream Ciphers and Block Ciphers, Attacks on block ciphers, Block Cipher Principles, The Data Encryption Standard (DES), Block Cipher Design Principles, Group, Rings, Field, Polynomial Arithmetic, The Euclidean Algorithm, Finite Fields of the Form $GF(2^n)$

UNIT III

Advanced Encryption Standard (AES), Stream Ciphers, RC4, The Chinese Remainder Theorem, Public Key Cryptography and RSA Algorithm, Diffie-Hellman Key Exchange, Elliptic Curve Cryptography.

UNIT IV

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions, Two Simple Hash Functions, Requirements and Security, Secure Hash Algorithm (SHA), SHA-3.

UNIT V

Introduction to Block Chain, Bitcoin basics, Smart Contracts, Blockchain development platforms and APIs, Blockchain Ecosystems, Ethereum, Distributed Consensus, Blockchain Applications

TEXTBOOKS/REFERENCES

1. Stallings, William. Cryptography and network security, Principle and Practice. Pearson Education India, 2017.
2. R. Stinson Cryptography, Theory and Practice (Fourth Edition Edition)
3. Handbook of Applied Cryptography by A. Menezes, P. Van Oorschot, S. Vanstone.
4. Melanie Swan, Blockchain, Blueprint for a new Economy, Oreilly.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC04) CLOUD COMPUTING**

III Year B. Tech II Sem

**L T P C
3 0 0 3**

Course Objectives:

- This course provides an insight into cloud computing.
- Topics covered include- distributed system models, different cloud service models,
- Service-Oriented architectures, cloud programming and software environments, resource management.

Course Outcomes:

- Demonstrates knowledge of various computing paradigms, including cloud, distributed, and emerging technologies like bio and quantum computing.
- Understands cloud computing fundamentals, including motivation, principles, and key deployment models in modern technology.
- Analyzes cloud architecture, covering infrastructure, application management, and migration processes to develop cloud solutions.
- Analyzes IaaS, PaaS, and SaaS cloud service models, noting their features, applications, and limitations for effective use.
- Compares major cloud providers and their tools, understanding key service offerings in the cloud computing ecosystem.
- Compares major cloud providers and their tools, understanding key service offerings in the cloud computing ecosystem.

UNIT - I

Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio Computing, Mobile Computing, Quantum Computing, Optical Computing, Nano Computing.

UNIT – II

Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

UNIT - III

Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

UNIT – IV

Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Pros and Cons of IaaS, Summary of IaaS Providers, Platform as a Service. Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

UNIT – V

Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue Service, Microsoft, Windows Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM, Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP, Sales force, Sales Cloud, Service Cloud: Knowledge as a Service, Rack space, VMware, Manjra soft, Aneka Platform

Text Books:

1. Essentials of cloud Computing: K. Chandrasekhar, CRC press, 2014

2. REFERENCE BOOKS:

1. Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
2. Distributed and Cloud Computing, Kai Hwang, Geoffrey C. Fox, Jack J. Donga Elsevier, 2012.
3. Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy, Shahed Latif, O'Reilly, SPD, 2011

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PE04)AGILE SOFTWARE DEVELOPMENT
PROFESSIONAL ELECTIVE –IV**

B.Tech. IV Year I Sem.

**L T P C
3 0 0 3**

Course Objectives:

- Organize Agile Software Development, Extreme Programming and Software Development Rhythms.
- Describe their unique features relative to traditional software practices
- Examine their applications in the real world and addresses their impacts on developing software.

Course Outcomes:

- Summarize the various agile methodologies: extreme programming, scrum, and feature driven programming.
- Apply the XP practices, pair programming and agile modeling for real time projects.
- Apply XP to a small project.
- Examine the process of Feature-Driven Development and Regaining Control.
- Relate Agile Modeling concepts with the Rational Unified Process (RUP), understanding how the two frameworks can be integrated for iterative and incremental software development.
- Select and apply appropriate tools for Agile Development, facilitating the modeling, documentation, and iteration processes in Agile software projects.

UNIT - I

Introduction: Agile Methods, Agile Manifesto, and Agile Modeling Introduction, What Is Agile, The Agile Manifesto, Agile Methods, XP: Extreme Programming, DSDM, SCRUM, Feature-Driven Development, Modeling Misconceptions, Agile Modeling, Tools of Misconceptions, Updating Agile Models

UNIT - II

Extreme Programming: Introduction, Core XP Values, The Twelve XP Practices, About Extreme Programming, Planning XP Projects, Test First Coding, Making Pair Programming Work

UNIT - III

Agile Modeling and XP: Introduction, The Fit, Common Practices, Modeling Specific Practices, XP Objections to Agile Modeling, Agile Modeling and Planning XP Projects, XP Implementation Phase

UNIT - IV

Feature-Driven Development: Introduction, Incremental Software Development, Regaining Control: The Motivation behind FDD, Planning an Iterative Project, Architecture Centric, FDD and XP

UNIT - V

Agile Methods with RUP and PRINCE2 and Tools and Obstacles: Agile Modeling and RUP, FDD and RUP, Agile Methods and PRINCE2, Tools to Help with Agile Development, Eclipse: An Agile IDE, Obstacles to Agile Software Development, Management Intransigence, The Failed Project Syndrome, Contractual Difficulties, Familiarity with Agility.

TEXT BOOKS:

1. Agile software construction, 1/e, John hunt, springer, 2005
2. Agile and Iterative Development: a manager's guide, Addison-Wesley Craig Larman, Pearson Education - 2004.

REFERENCE BOOKS:

2. The Art of Agile Development, Pearson, Robert C. Martin, Juli, James Shore, Chromatic, 2013, O'Reilly Media.
3. Agile Testing, Elisabeth Hendrickson, Quality Tree Software Inc 2008.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PE07) BLOCKCHAIN TECHNOLOGY
PROFESSIONAL ELECTIVE –IV**

IV Year B.Tech I Sem

**L T P C
3 0 0 3**

Prerequisites:

- Knowledge in information security and applied cryptography.
- Knowledge in Computer Networks

Course Objectives:

- To learn the fundamentals of Block chain and various types of block chain and consensus mechanisms.
- To understand the public block chain system, Private block chain system and consortium block chain.
- Able to know the security issues of block chain technology.

Course Outcomes:

At the end of course student will be able to-

- Analyze the fundamental components of block chain technology, including its origin, types, and consensus mechanisms, to assess its impact on decentralization and distribution.
- Evaluate public block chain systems, particularly Bitcoin and Ethereum, and their applications, including the development and characteristics of smart contracts within these ecosystems.
- Design and implement solutions using private and consortium block chain systems, demonstrating an understanding of their key characteristics, use cases, and algorithms like Byzantine Fault Tolerance.
- Assess security challenges in block chain technology, including identity management, regulatory compliance, and safeguarding smart contracts, proposing solutions to enhance security and privacy.
- Ideate various applications of block chain across industries such as finance, healthcare, and supply chain management, identifying potential benefits and limitations of block chain technology.
- Develop block chain applications using Python and Hyper ledger Fabric, demonstrating proficiency in block chain programming and the ability to create practical solutions using block chain frameworks.

UNIT-I

Fundamentals of Block chain: Introduction, Origin of Block chain, Block chain Solution Components of Block chain, Block in a Block chain, The Technology and the Future.

Block chain Types and Consensus Mechanism: Introduction, Decentralization and Distribution, Types of Block chain, Consensus Protocol.

Crypto currency, Bitcoin, Altcoin and Token: Introduction, Bitcoin and the Crypto currency ,Crypto currency Basics, Types of Crypto currencies, Crypto currency Usage.

UNIT-II

Public Block chain System: Introduction, Public Block chain, Popular Public Block chains, The Bitcoin Block chain, Ethereum Block chain.

Smart Contracts: Introduction, Smart Contract, Characteristics of a Smart Contract, Types of Smart Contracts, Types of Oracles, Smart Contracts in Ethereum, Smart Contracts in Industry.

UNIT-III

Private Block chain System: Introduction, Key Characteristics of Private Block chain, Need of Private Block chain, Private Block chain Examples, Private Block chain and Open Source, E-commerce Site Example, Various Commands (Instructions) in E-commerce Block chain, Smart Contract in Private Environment, State Machine, Different Algorithms of Permissioned Block chain, Byzantine Fault, Multichain.

Consortium Block chain: Introduction, Key Characteristics of Consortium Block chain, Need of Consortium Block chain, Hyper ledger Platform, Overview of Ripple, Overview of Corda .Initial Coin Offering: Introduction, Block chain Fundraising Methods, Launching an ICO, Investing in an ICO, Pros and Cons of Initial Coin Offering, Successful Initial Coin Offerings, Evolution of ICO, ICO Platforms.

UNIT-IV

Security in Block chain: Introduction, Security Aspects in Bit coin, Security and Privacy Challenges of Block chain in General, Performance and Scalability, Identity Management and Authentication, Regulatory Compliance and Assurance, Safeguarding Block chain Smart Contract (DApp), Security Aspects in Hyper ledger Fabric.

Applications of Block chain: Introduction, Block chain in Banking and Finance, Block chain in Education, Block chain in Energy, Block chain in Healthcare, Block chain in Real-estate, Block chain In Supply Chain, The Block chain and Io T. Limitations and Challenges of Block chain.

UNIT-V

Block chain Case Studies: Case Study 1, Retail, Case Study 2, Banking and Financial Services, Case Study 3, Healthcare, Case Study 4, Energy and Utilities.

Block chain Platform using Python: Introduction, Learn How to Use Python Online Editor, Basic Programming Using Python, and Python Packages for Block chain.

Block chain platform using Hyper ledger Fabric: Introduction, Components of Hyper ledger Fabric Network, Chain codes from Developer.ibm.com, Block chain Application Using Fabric Java SDK.

TEXTBOOKS:

1. Ambadas, Arshad Sarfarz Ariff, Sham “Block chain for Enterprise Application Developers”, Wiley
2. Andreas M. Antonopoulos, “Mastering Bitcoin: Programming the Open Block chain” , O’Reilly

REFERENCE BOOKS:

1. Blockchain: A Practical Guide to Developing Business, Law, and Technology Solutions, Joseph Bambara, Paul R. Allen, Mc Graw Hill.
2. Blockchain: Blueprint for a New Economy, Melanie Swan, O’Reilly.

ONLINE LEARNING RESOURCES:

1. <https://github.com/blockchainedindia/resources>
2. Hyper ledger Fabric - <https://www.hyperledger.org/projects/fabric>
3. Zero to Block chain - An IBM Redbooks course, by Bob Dill, David Smits

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE07) MOBILE APPLICATION SECURITY****IV Year B.Tech I Sem****L T P C
3 0 0 3****Course Objectives**

- To provide a foundational understanding of Android application development and its security architecture, including permission models, sandboxing, and APK structure.
- To explore the iOS ecosystem, including its security framework, codesigning, sandboxing, and IPA file structure.
- To enable students to set up mobile app penetration testing environments and analyze basic vulnerabilities in Android applications.
- To study common mobile app vulnerabilities such as insecure data storage, transport layer weaknesses, and authentication flaws.
- To develop skills in mobile app security testing using static and dynamic analysis techniques.
- To introduce industry-standard tools like OWASP ZAP, Burp Suite, and MobSF for identifying and mitigating mobile application security issues.

Course Outcomes

At the end of course student will be able to-

CO1: Understand Android's hardware/software architecture and evaluate its security mechanisms including sandboxing, permission models, and APK structure.

CO2: Understand the iOS architecture and analyze its application security features such as keychain, sandboxing, and IPA file system.

CO3: Set up a mobile penetration testing environment and identify vulnerabilities using tools like Drozer and Burp for Android applications.

CO4: Identify and assess key mobile app security flaws such as insecure storage, weak encryption, and poor authentication mechanisms.

CO5: Perform security testing of mobile apps using static and dynamic analysis methods to detect vulnerabilities and security misconfigurations.

CO6: Use tools such as OWASP ZAP, Burp Suite, and MobSF to conduct thorough mobile application penetration testing.

UNIT-I

Introduction to Android Applications and Mobile App Security: History of Android, Understanding Android Hardware and Software Architecture, Understanding Android Security Model, Understanding Android Permission Model for Application Security, Sandboxing, Codesigning, Encryption, Rooting Devices, Understanding APK Understanding Directories and Files on an APK

UNIT-II

Introduction to IOS & IPA Applications: History of iOS, Understanding iOS Hardware and Software Architecture, Understanding iOS Security Model, Understanding iOS Permission Model for Application Security Sandboxing, Codesigning, Keychain and Encryption, Jailbreaking Devices, Understanding IPA, Understanding Directories and Files on an IPA

UNIT-III

Mobile Application Attacks 1: Setting up Mobile App Pentesting Environment, Interact with the Devices, Starting with Drozer, Understanding AndroidManifest.xml, Configuring, Burp and Traffic Interception, Traffic Interception Bypass, Weak Server Side Controls,

UNIT-IV

Insecure Data Storage, Insufficient Transport Layer Protection, Unintended Data Leakage, Poor Authentication & Authorization Unintended Data Leakage, Poor Authentication & Authorization

UNIT-V

Mobile App Security Testing: Static Analysis, Dynamic Analysis, Penetration Testing: Conducting simulated attacks to find vulnerabilities. Security Testing Tools: Introduction to tools like OWASP ZAP, Burp Suite, and mobile specific tools like MobSF.

Text Books:

1. FL: Auerbach Publications - Fried, S “Mobile device security: A comprehensive guide to securing your information in a moving world. Boca Raton”
2. IN: Wiley, John & Sons - Stuttard, D. & Pinto, M “The web application hacker’s handbook: Discovering and exploiting security flaws.” Indianapolis
3. Dwivedi, H., Clark, C., & Thiel, D “Mobile application security. New York: McGraw-Hill Companies.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2467PE07)DATA SCIENCE WITH R PROGRAMMING
PROFESSIONAL ELECTIVE –IV

B.Tech. IV Year I Sem

L T P C
3 0 0 3

Course Objectives:

- Data Science is a fast-growing interdisciplinary field, focusing on the analysis of data to extract knowledge and insight.
- This course will introduce students to the collection.
- Preparation, analysis, modelling and visualization of data, covering both conceptual and ds practical issues.
- Examples and case studies from diverse fields will be presented, and hands- on use of statistical and data manipulation software will be included.

Course Outcomes:

At the end of course student will be able to-

- Critically assess the stages within the data science process, evaluate their interdependencies, and formulate strategies for effective problem-solving within each stage.
- Design and configure a suitable software environment for Python and R, implement advanced techniques for data manipulation, and evaluate the effectiveness of these configurations for different types of data.
- Apply advanced data manipulation and visualization techniques using tools like Pandas and Matplotlib, synthesize insights from visual representations, and justify choices of specific tools and techniques for given data scenarios.
- Construct data science applications by integrating multiple data science techniques, analyze their performance, and refine the application to improve effectiveness and accuracy.
- Examine and critique a variety of data science projects, identify common challenges and practices, and propose improvements based on analysis and evaluation of project outcomes.
- Evaluate and select appropriate R-modeling methods, such as linear and logistic regression, justify the choice based on data characteristics, and develop a strategy for model evaluation and refinement

UNIT I:

Defining Data Science and Big data, Benefits and Uses, facets of Data, Data Science Process. History and Overview of R, Getting Started with R, R Nuts and Bolts

UNIT II:

The Data Science Process: Overview of the Data Science Process-Setting the research goal, Retrieving Data, Data Preparation, Exploration, Modeling, data Presentation and Automation. Getting Data in and out of R, Using reader package, Interfaces to the outside world.

UNIT III:

Machine Learning: Understanding why data scientists use machine learning-What is machine learning and why we should care about, Applications of machine learning in data science, where it is used in data science, The modeling process, Types of Machine Learning-Supervised and Unsupervised.

UNIT IV:

Handling large Data on a Single Computer: The problems we face when handling large data, General Techniques for handling large volumes of data, Generating programming tips for dealing with large datasets.

UNIT V:

Subsetting R objects, Vectorised Operations, Managing Data Frames with the dplyr, Control structures, functions, Scoping rules of R, Coding Standards in R, Loop Functions, Debugging, Simulation. Case studies on preliminary data analysis.

TEXTBOOKS:

1. DavyCielen, Arno.D.B.Maysman, Mohamed Ali, “Introducing Data Science” Manning Publications, 2016.
2. Roger D. Peng, “R Programming for DataScience” Lean Publishing, 2015.

REFERENCE BOOKS:

1. Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
2. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, AbhijitDasgupta, “PracticalData Science Cookbook”, Packt Publishing Ltd., 2014.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE05) LARGE LANGUAGE MODELS
PROFESSIONAL ELECTIVE –IV**

IV Year B.Tech I Sem

L T P C

3 0 0 3

Prerequisites:

- Basic understanding of programming concepts (Python or similar)
- Familiarity with natural language processing (NLP) fundamentals
- Completion of introductory courses in computer science and engineering
- Basic knowledge of machine learning and deep learning concepts

Course Objectives:

- To introduce students to the concepts and architectures of large language models
- To develop skills in implementing and fine-tuning pre-trained language models
- To analyze and evaluate the performance of large language models on various NLP tasks
- To design and develop applications using large language models
- To apply ethical considerations and potential biases in large language models
- To prepare students for careers in NLP, AI, and related fields, and provide a foundation for further study in advanced NLP topics

Course Outcomes:

At the end of course student will be able to-

- Understand Transformer Architecture To solve training based problems
- Analyze Language Modeling Techniques.
- Examine Tokenization Methods.
- Evaluate Model Complexity and Efficiency.
- Optimize Training and Fine-Tuning Strategies.
- Critically Assess Model Benchmarks

UNIT I: Introduction to Large Language Models- Overview of natural language processing (NLP) and language models- History and evolution of large language models- Types of language models: transformer-based, recurrent neural network (RNN), and hybrid models- Applications of large language models: language translation, text summarization, chat bots, and more

UNIT II: Transformer-Based Language Models- In-depth analysis of transformer architecture and its variants- BERT, RoBERTa, and other pre-trained language models- Fine-tuning and adapting transformer models for specific NLP tasks- Advantages and limitations of transformer-based models.

UNIT III: Training and Evaluation of Large Language Models- Large-scale dataset preparation and preprocessing- Model training and optimization techniques- Evaluation metrics and methodologies for language models- Common challenges and pitfalls in training large language models.

UNIT IV: Advanced Topics in Large Language Models- Multimodal language models and vision-language integration- Explainability and interpretability techniques for languagemodels- Ethical considerations and potential biases in large language models- Future directions and research opportunities in the field.

UNIT V: Applications and Project Development- Hands-on project development using large language models- Applications in computer vision, speech recognition, and other areas- Case studies and industry applications of large language models- Best practices for deploying and maintaining large language models in real-world scenarios

TEXTBOOKS:

1. "Hands-On Large Language Models" by O'Reilly ¹
2. "Build a Large Language Model (From Scratch)" by Manning Publications ²
3. "Natural Language Processing with Transformers" by Lewis Tunstall and Leandro von Werra
4. "Transformers for Natural Language Processing and Computer Vision" by Denis Rothman ³
5. "Hands-On Large Language Models: Language Understanding and Generation" by Jay Alamar and Maarten Grootendorst ³

REFERENCE BOOKS:

1. "Quick Start Guide to Large Language Models: Strategies and Best Practices for Using Chat GPT and Other LLMs" by Addison-Wesley Data & Analytics Series ³
2. "Building LLM Powered Applications: Create intelligent apps and agents with large language models" by Valentina Alto ³
3. "Demystifying the Power of Large Language Models: A deep dive into large language models" by Theophilus Siameh ³
4. "Mastering Large Language Models with Python: Unleash the Power of Advanced Natural Language Processing for Enterprise Innovation and Efficiency" by Raj Arun R ³
5. "Generative AI with Lang Chain: Build large language model (LLM) apps with Python, Chat GPT and other LLMs" by Ben Auffarth ³

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE03) COGNITIVE COMPUTING
(PROFESSIONAL ELECTIVE - IV)

IV Year B.Tech. I –Sem

L T P C
3 0 0 3

Prerequisites: Probability theory

Course Objectives:

- To provide an understanding of the central challenges in realizing aspects of human cognition.
- To provide a basic exposition to the goals and methods of human cognition.
- To develop algorithms that use AI and machine learning along with human interaction and feedback to help humans make choices/decisions.
- To support human reasoning by evaluating data in context and presenting relevant findings along with the evidence that justifies the answers.

Course Outcomes:

At the end of course student will be able to-

- Understand and discuss what cognitive computing is, and how it differs from traditional Approaches
- Analyze the business implications of cognitive computing
- Apply natural language technologies to business problems
- Develop applications for Watson.
- Analyze the case studies of cognitive computing
- Apply AI in Real-World Cognitive Systems.

UNIT - I

Introduction to Cognitive Science: Understanding Cognition, IBM's Watson, Design for Human Cognition, Augmented Intelligence and Cognition Modeling Paradigms: Declarative/ logic-based computational cognitive modeling, connectionist models of cognition, Bayesian models of cognition, a dynamical systems approach to cognition

UNIT - II

Cognitive Models of memory and language, computational models of episodic and semantic memory, modeling psycholinguistics

UNIT - III

Cognitive Modeling: modeling the interaction of language, memory and learning, modeling select aspects of cognition classical models of rationality, symbolic reasoning and decision making

UNIT - IV

Formal models of inductive generalization, causality, categorization and similarity, the role of analogy in problem solving, Cognitive Development Child concept acquisition. Cognition and Artificial cognitive architectures such as ACT-R, SOAR, Open Cog, Copy Cat, Memory Networks

UNIT – V

Deep Q A Architecture, Unstructured Information Management Architecture (UIMA), Structured Knowledge, Business Implications, Building Cognitive Applications, Application of Cognitive Computing and Systems

TEXTBOOKS:

1. The Cambridge Handbook of Computational Psychology by Ron Sun (ed.), Cambridge University Press.
2. Formal Approaches in Categorization by Emmanuel M. Pathos, Andy J. Wills, Cambridge University Press.

REFERENCE BOOKS:

1. Judith S. Hurwitz, Marcia Kaufman, Adrian Bowles Cognitive Computing and Big Data Analytics, Wiley

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC63)CRYPTOGRAPHY AND NETWORK SECURITY LAB**

B.Tech. IV Year I Sem.

**L T P C
0 0 3 1**

Course Objectives:

1. Understand various cryptographic algorithms.
2. Understand the basic categories of threats to computers and networks
3. Describe public-key cryptosystem.
4. Describe the enhancements made to IPv4 by IPSec
5. Understand Intrusions and intrusion detection
6. Discuss the fundamental ideas of public-key cryptography.

Course Outcomes:

At the end of course student will be able to-

1. Understand and explain foundational cryptographic techniques including symmetric and asymmetric algorithms, hashing, and digital signatures.
2. Apply authentication methods and security protocols to ensure secure communication over networks and web systems.
3. Analyze system security requirements and design security measures for both client-side and server-side components of information systems
4. Identify common vulnerabilities and threats in information systems and propose appropriate countermeasures.
5. Use tools and techniques for intrusion detection, malware analysis, and vulnerability assessment in practical scenarios.
6. Understand and evaluate current legal, ethical, and compliance issues in the domain of cybersecurity and information security.

LIST OF PRACTICAL EXPERIMENTS

1. Write a program take text file as an input and print word, character count and ascii value of each characters as output. (Hint: Use open (), read () and split ()).
2. Write an encryption program: Input: computer science engineering mrecw
Output: gsqtyxivwgmirgiirkmriivmrkwvqymzivwmxc Hint: key =4 (play with ascii value).
3. Raju send an encrypted message (cipher text) “PHHW PH DIWHU WKH WRJD SDUWB” to Rani.
Can you build decryption process and find out what is the message (plain text) send to Rani?
Hint: try all keys.
4. Raju sends encrypted message “ZICVTWQNGKZEIIGASXSTSLVWLA” to Rani. Can you build decryption process and find out what is the message send to Rani. Hint: try all keys for each character.
5. Kohli have plain text “wewishtoreplaceplayer”. Can you build encryption process and find out what is the cipher text he needs send to BCCI. Help him out by using monoalphabetic cipher. Hint: use any one-to-one mapping between alphabets. One to one mapping

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A N D R E W I C K S O H T B F G J L M P Q U V X Y Z

6. Kohli sent encrypted message (Cipher text) “SEEMSEAOMEDSAMHL” to Anushka. Can you build decryption process and find out what is the message (plain text) send to Anushka. Hint: use above one to one mapping between alphabets.
7. Raju wants to build encrypted and decryption algorithms of Playfair Cipher. Help him to build a key matrix using the key “mrecwautonomous”
8. By using key “CBDE” Raju would like send message (plain text)“HELLO WORLD” to Rani. Can you build encryption process and find out what is the encrypted message (cipher text) to Raju by using Hill Cipher. Also Can you build decryption process and find out what is the decrypted message(plain text) of cipher text "SLHZYATGZT" by using Hill Cipher.
9. Implementation of Encryption and Decryption of Vigenère Cipher keyword deceptive Key: deceptivedeceptivedeceptive Plaintext: we are discovered save yourself

TEXT BOOKS:

1. Cryptography and Network Security - Principles and Practice: William Stallings, Pearson Education, 6th Edition
2. Cryptography and Network Security: Atul Kahate, Mc Graw Hill, 3rd Edition

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2. Cryptography and Network Security: Forouzan Mukhopadhyay, Mc Graw Hill, 3rd Edition
3. Information Security, Principles, and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Security: WM. Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PC66)CLOUD COMPUTING LAB**

B.Tech. IV Year I Sem.

**L T P C
0 0 3 1**

Course Objectives:

- This course provides an insight into cloud computing
- Topics covered include- distributed system models, different cloud service models, service oriented architectures, cloud programming and software environments, resource management.

Course Outcomes:

At the end of course student will be able to-

- Understand the fundamental concepts of cloud computing, including its architecture, service models (IaaS, PaaS, SaaS), and deployment models (public, private, hybrid).
- Analyze the underlying technologies that support cloud computing such as virtualization, distributed systems, and data centers.
- Demonstrate the ability to program and deploy applications using cloud platforms and tools.
- Identify and explore various cloud simulation and middleware tools like CloudSim and Globus Toolkit.
- Compare and evaluate cloud service providers based on scalability, security, cost, and performance factors.
- Apply appropriate cloud programming paradigms to solve real-world and scientific computing problems efficiently.

List of Experiments:

1. Install Virtualbox/VMware Workstation with different flavors of Linux or windows OS on top of windows7 or 8.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Create an Amazon EC2 instance and set up a web-server on the instance and associate an IP address with the instance.
4. Install Google App Engine. Create a hello world app and other simple web applications using python/java.
5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.
7. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)
8. Install Hadoop single node cluster and run simple applications like word count.
9. Create a database instance in the cloud using Amazon RDS.
10. Create a database instance in the cloud using Google Cloud SQL

TEXT BOOK:

1. Essentials of cloud Computing: K. Chandrasekhran, CRC press, 2014

REFERENCE BOOKS:

1. Cloud Computing: Principles and Paradigms by Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Wiley, 2011.
2. Distributed and Cloud Computing, Kai Hwang, Geoffery C. Fox, Jack J. Dongarra, Elsevier, 2012.
3. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400MC07) GENDER SENSITIZATION

(Mandatory Course)

IV Year B.Tech I Sem

L T P C
2 0 0 0

Course Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Course Outcomes:

At the end of course student will be able to-

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

UNIT - I

UNDERSTANDING GENDER

Gender: Why Should We Study It? (Towards a World of Equals: Unit -1) Socialization: Making Women, Making Men (Towards a World of Equals: Unit -2)

Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

UNIT - II

GENDER AND BIOLOGY

Missing Women: Sex Selection and Its Consequences (Towards a World of Equals: Unit 4) Declining Sex Ratio. Demographic Consequences.

Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit -10) Two or Many? Struggles with Discrimination.

UNIT - III**GENDER AND LABOUR**

Housework: the Invisible Labour (Towards a World of Equals: Unit -3) “My Mother doesn’t Work.” “Share the Load.” Women’s Work: Its Politics and Economics (Towards a World of Equals: Unit -7) Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

UNIT - IV**ISSUES OF VIOLENCE**

Sexual Harassment: Say No! (Towards a World of Equals: Unit -6)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “Chupulu”.

Domestic Violence: Speaking Out (Towards a World of Equals: Unit -8)

Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice.

Thinking about Sexual Violence (Towards a World of Equals: Unit -11)

Blaming the Victim-“I Fought for my Life....” - Additional Reading: The Caste Face of Violence.

UNIT - V**GENDER: CO - EXISTENCE**

Just Relationships: Being Together as Equals (Towards a World of Equals: Unit -12) Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Additional Reading: Rosa Parks-The Brave Heart.

TEXT BOOK:

All the five Units in the Textbook, “Towards a World of Equals: A Bilingual Textbook on Gender” written by A. Suneetha, Uma Bhargubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad, Telangana State in the year 2015.

Note: Since it is an Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

REFERENCE BOOKS:

- Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
- Abdulali Sohaila. “I Fought For My Life...and Won.” Available online at:

<http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdul/>

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2467PE08) SOCIAL NETWORK ANALYTICS
PROFESSIONAL ELECTIVE-V**

B.Tech. IV Year II Sem

**L T P C
3 0 0 3**

Course Objectives:

- Explore the fundamentals of social network analysis and its applications.
- Apply Natural Language Processing (NLP) techniques to extract insights from social network data.
- Leverage Large Language Models (LLMs) for advanced social network analytics.
- Develop models for sentiment analysis, topic modeling, and trend detection.
- Evaluate network dynamics, community detection, and influence propagation.

Course Outcomes:

At the end of course student will be able to-

- Illustrate the principles of social network structures and their representations.
- Apply NLP techniques for text preprocessing, vectorization, and feature extraction.
- Utilize LLMs to generate and analyze social network content.
- Design models for sentiment analysis, named entity recognition, and topic modeling.
- Investigate community detection algorithms and analyze network influence.
- Implement practical social network analysis projects using Python and relevant libraries.

UNIT I:

Overview of SNA: Definitions, importance, and applications, Graph theory basics: Nodes, edges, adjacency matrix, and degree centrality, Types of social networks: Directed, undirected, weighted, and bipartite networks, Visualization of social networks

UNIT II:

Text preprocessing: Tokenization, stemming, lemmatization, and stopword removal, Vectorization techniques: Bag-of-Words, TF-IDF, and word embeddings, Named entity recognition and part-of-speech tagging, Sentiment analysis and opinion mining

UNIT III:

Introduction to LLMs: GPT, BERT, and their architectures, Fine-tuning LLMs for social network data analysis, Text generation and completion with LLMs, Ethical considerations and biases in LLMs

UNIT IV:

Advanced Social Network Analytics, Community detection algorithms: Modularity, Louvain, and Girvan-Newman, Influence analysis and information diffusion models, Centrality measures: Betweenness, closeness, and eigenvector centrality, Trend detection and event prediction in social networks

UNIT V:

Practical Applications and Case Studies, Sentiment analysis on social media data, Hashtag and topic trend analysis, Fake news detection and misinformation analysis, Real-world case studies and project development

TEXTBOOKS:

1. "Social Network Analysis: Methods and Applications" by Wasserman and Faust
2. "Speech and Language Processing" by Daniel Jurafsky and James H. Martin
3. "Deep Learning for Natural Language Processing" by Palash Goyal et al.
4. Research papers and online resources on LLM and social network analysis

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412PE05)HUMAN COMPUTER INTERACTION
Professional Elective - V

IV Year B.Tech. I –Sem

L T P C
3 0 0 3

Course Objectives:

- To gain an overview of Human-Computer Interaction (HCI), with an understanding of user interface design in general, and alternatives to traditional "keyboard and mouse" computing;
- Apply models from cognitive psychology to predicting user performance in various human-computer interaction tasks and recognize the limits of human performance as
- Apply to computer operation; appreciate the importance
- Design and evaluation methodology that begins with and maintains a focus on the user

Course Outcomes:

At the end of course student will be able to-

- Understand the fundamental principles of user-centered design, including graphical user interfaces and their role in effective Human-Computer Interaction.
- Apply screen design principles to create structured, visually pleasing interfaces that facilitate efficient navigation and data retrieval.
- Analyze user interface components such as text, icons, colors, and multimedia to optimize the overall user experience.
- Evaluate HCI designs through usability engineering techniques, utilizing heuristics, design standards, and user evaluation methods to enhance usability.
- Develop cognitive and physical models to inform interface design, using goal-task hierarchies and linguistic models for effective user interaction.
- Construct and assess applications of emerging HCI technologies, including augmented reality and ubiquitous computing, to solve complex real-world interaction challenges.

UNIT - I

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT - II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions. Screen Designing: Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT- III

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls. Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT- IV

HCI in the software process, The software life cycle Usability engineering Iterative design and prototyping Design Focus: Prototyping in practice Design rationale Design rules Principles to support usability Standards

Golden rules and heuristics HCI patterns Evaluation techniques, Goals of evaluation, Evaluation through expert analysis, Evaluation through user participation, Choosing an evaluation method. Universal design, Universal design principles Multi-modal interaction

UNIT- V

Cognitive models Goal and task hierarchies Design Focus: GOMS saves money Linguistic models The challenge of display-based systems Physical and device models Cognitive architectures Ubiquitous computing and augmented realities Ubiquitous computing applications research Design Focus: Ambient Wood – augmenting the physical Virtual and augmented reality Design Focus: Shared experience Design Focus: Applications of augmented reality Information and data visualization Design Focus: Getting the size right.

TEXT BOOKS:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley Dream Tech. Units 1, 2, 3
2. Human – Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson Education Units 4,5

REFERENCE BOOKS:

1. Designing the user interface. 3rd Edition Ben Shneidermann, Pearson Education Asia.
2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech.
3. User Interface Design, Soren Lauesen , Pearson Education.
4. Human –Computer Interaction, D. R. Olsen, Cengage Learning.
5. Human –Computer Interaction, Smith - Atakan, Cengage Learning.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE09) GAME THEORY**

B.Tech. IV Year I Sem

**L T P C
3 0 0 3**

Course Objectives:

- The course will explain in depth the standard equilibrium concepts (such as Nash equilibrium, Subgame-Perfect Nash Equilibrium, and others) in Game Theory.

Course Outcomes:

At the end of course student will be able to-

- **Evaluate and Distinguish** various concepts in game theory, including Nash Equilibrium, bounded rationality, and strategic games, by analyzing examples and illustrating their relevance to competitive equilibrium in economic contexts.
- **Analyze and Apply** mixed, correlated, and evolutionary equilibria concepts by employing rationalizability and the iterated elimination of dominated actions to derive optimal strategies in complex game scenarios.
- **Synthesize and Construct** models of knowledge in game theory, assessing how common knowledge impacts agreement and disagreement among rational agents, and apply these concepts to real-world situations like the Electronic Mail Game.
- **Develop and Demonstrate** strategies for extensive games with perfect information, including the formulation of subgame perfect equilibria and the interpretation of strategies, while exploring notable finite horizon games through practical examples.
- **Critically Analyze** repeated games by contrasting infinitely repeated and finitely repeated games, and by applying concepts such as trigger strategies and the various perfect folk theorems to elucidate the implications of punishment and reward structures on player behavior.
- **Formulate and Assess** complex bargaining strategies within the context of game theory, particularly through the lens of alternating offers, evaluating the conditions for achieving subgame perfect equilibria and their implications for real-world negotiation scenarios.

UNIT - I

Introduction- Game Theory, Games and Solutions Game Theory and the Theory of Competitive Equilibrium, Rational Behavior, The Steady State and Deductive Interpretations, Bounded Rationality Terminology and Notation. Nash Equilibrium- Strategic Games, Nash Equilibrium Examples Existence of a Nash Equilibrium, Strictly Competitive Games, Bayesian Games: Strategic Games with Imperfect Information.

UNIT - II

Mixed, Correlated, and Evolutionary Equilibrium - Mixed Strategy Nash Equilibrium, Interpretations of Mixed Strategy Nash Equilibrium, Correlated Equilibrium, Evolutionary Equilibrium, Rationalizability and Iterated Elimination of Dominated Actions -Rationalizability Iterated Elimination of Strictly Dominated Actions, Iterated Elimination of Weakly Dominated Actions.

UNIT - III

Knowledge and Equilibrium -A Model of Knowledge Common Knowledge, Can People Agree to Disagree? Knowledge and Solution Concepts, The Electronic Mail Game

UNIT - IV

Extensive Games with Perfect Information -Extensive Games with Perfect Information Sub game

Perfect Equilibrium Two Extensions of the Definition of a Game the Interpretation of a Strategy, Two Notable Finite Horizon Games, Iterated Elimination of Weakly Dominated, Strategies Bargaining Games – Bargaining and Game Theory, A Bargaining Game of Alternating Offers Sub game Perfect Equilibrium Variations and Extensions.

UNIT - V

Repeated Games - The Basic Idea Infinitely Repeated Games vs.\ Finitely Repeated Games, Infinitely Repeated Games: Definitions Strategies as Machines Trigger Strategies: Nash Folk, Theorems Punishing for a Limited Length of Time: A Perfect Folk Theorem for the Limit of Means Criterion Punishing the Punisher: A Perfect Folk Theorem for the Overtaking Criterion, Rewarding Players Who Punish: A Perfect Folk Theorem for the Discounting Criterion The Structure of Sub game Perfect Equilibria Under the Discounting Criterion Finitely Repeated Game.

TEXT BOOKS:

1. A course in Game Theory, M. J. Osborne and A. Rubinstein, MIT Press
2. Game Theory, Roger Myerson, Harvard University Press
3. Game Theory, D. Fudenberg and J. Tirole, MIT Press

REFERENCE BOOKS:

1. Theory of Games and Economic Behavior, J. von Neumann and O. Morgenstern, New York: John Wiley and Sons.
2. Games and Decisions, R.D. Luce and H. Raiffa, New York: John Wiley and Sons.
3. Game Theory, G. Owen, 2nd Edition, New York: Academic Press.

**MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2462PE28) INFORMATION SECURITY MANAGEMENT**

B.Tech. IV Year II Sem

**L T P C
3 0 0 3**

Course Objectives:

- To provide a comprehensive understanding of information security principles, risk management processes, cryptographic methods, and security frameworks for protecting information systems.
- To develop the ability to evaluate, implement, and manage security technologies, policies, and best practices in response to real-world cybersecurity threats and compliance requirements.

Course Outcomes:

At the end of course student will be able to-

- Understand the core principles of information security, including confidentiality, integrity, availability (CIA), and key security models such as Bell-LaPadula and Biba.
- Analyze and apply risk management techniques and formulate security policies that align with organizational and legal requirements.
- Apply cryptographic techniques and network security protocols to ensure secure communication, data protection, and access control.
- Evaluate and implement security management technologies such as SIEM, IDS/IPS, endpoint security, and cloud/mobile security tools.
- Plan and respond to security incidents through structured incident handling, forensic analysis, and auditing practices.
- Critically assess security frameworks and emerging trends such as AI in cybersecurity and IoT security, drawing lessons from real-world breach case studies.

UNIT I:

Introduction to Information Security: **Information Security Concepts:** Confidentiality, Integrity, Availability (CIA Triad), **Types of Security Threats:** Malicious attacks, insider threats, social engineering, **Security Models:** Bell-LaPadula, Biba, Clark-Wilson, **Information Security Governance:** Risk management, compliance, security policies, **Security Management Frameworks:** ISO 27001, NIST, COBIT

UNIT II: Risk Management and Security Policies: **Risk Management Process:** Identification, assessment, and mitigation, **Risk Analysis Techniques:** Qualitative and quantitative risk analysis, **Security Policies:** Creation, implementation, and enforcement, **Business Continuity and Disaster Recovery Planning, Governance and Compliance:** Legal and regulatory requirements (GDPR, HIPAA, etc.)

UNIT III: Cryptography and Network Security: Cryptographic Techniques: Symmetric and asymmetric encryption, hashing, digital signatures, **Public Key Infrastructure (PKI):** Digital certificates, Certificate Authorities (CAs), **VPN and Firewall Configurations:** Basics of secure communication and access control, **Network Security Protocols:** SSL/TLS, IPSec, VPNs, firewalls, IDS/IPS, **Authentication and Access Control Models:** Single Sign-On (SSO), Multi-Factor Authentication (MFA)

UNIT IV: Security Management Technologies: Endpoint Security: Antivirus software, endpoint detection and response (EDR), **Security Information and Event Management (SIEM):** Log management and threat detection, **Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS), Cloud Security:** Virtualization, security challenges, and solutions, **Mobile Device Security:** BYOD (Bring Your Own Device) security policies

UNIT V: Security Management Best Practices and Case Studies: Security Frameworks and Standards: ISO 27001, NIST, ITIL for IT security management, **Incident Response and Handling:** Preparing for and responding to security incidents, **Security Audits and Forensics:** Conducting audits, gathering evidence, and forensic analysis, **Emerging Trends in Information Security:** AI and machine learning in cybersecurity, IoT security, **Real-World Security Breaches and Lessons Learned:** Case studies of major breaches (e.g., Equifax, Target)

Text Books:

1. Information Security Management Handbook by Harold F. Tipton & Micki Krause
2. Principles of Information Security by Michael E. Whitman and Herbert J. Mattord
3. Cybersecurity and Cyberwar: What Everyone Needs to Know by P.W. Singer & Allan Friedman

Reference Books:

- Information Security: Principles and Practice by Mark Stamp
- ISO 27001:2013 - Information Security Management by Alan Calder
- Network Security Essentials by William Stallings

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2467PE19)DATA WRANGLING
Professional Elective – V

B.Tech. IV Year II Sem.

L T P C
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Course Objectives:

The students will try to learn:

- The concept and importance of data wrangling using Python.
- The data cleaning and formatting techniques using Python.
- The working with Excel, PDF and with non-relational database not supported by SQL using python.
- The application of techniques suitable for Web mining applications.

Course Outcomes:

After successful completion of the course, students should be able to:

- Outline the concept of and the steps in data wrangling process and the python .Remember basics necessary for implementing the data wrangling.
- Summarize the parsing approaches of the Excel as well as PDF Files for Understand devising techniques to deal with uncommon file types.
- Distinguish between MySQL/ Postgre SQL and NoSQL for storing and Analyze acquiring of data to and from the relational and the non-relational databases respectively.
- Analyze the operations involved in formatting and cleaning the data using Understand Python for subsequent data analysis.
- Make use of python libraries for identifying outliers and correlations in the Apply data, and visualizing the same efficiently.
- Choose appropriate method of web scraping and crawling based on website model. Apply for acquiring and storing data from world web with in python framework.

UNIT-I:

INTRODUCTION TO DATA WRANGLING

What Is Data Wrangling? Importance of Data Wrangling, how is Data Wrangling performed? Tasks of Data Wrangling, Data Wrangling Tools, Introduction to Python, Python Basics, Data Meant to Be Read by Machines, CSV Data, JSON Data, XML Data.

UNIT-II:

WORKING WITH EXCEL FILES AND PDFS

Installing Python Packages, Parsing Excel Files, Getting Started with Parsing, PDFs and Problem Solving in Python, Programmatic Approaches to PDF Parsing, Converting PDF to Text, Parsing PDFs Using pdf miner, Acquiring and Storing Data, Databases: A Brief Introduction-Relational Databases: MySQL and Postgre SQL,Non- Relational Databases: NoSQL, When to use a Simple File, Alternative Data Storage.

UNIT– III:**DATA CLEANUP**

Why Clean Data? Data Cleanup Basics, Identifying Values for Data Cleanup, Formatting Data, Finding Outliers and Bad Data, Finding Duplicates, Fuzzy Matching, RegEx Matching. Normalizing and Standardizing the Data, Saving the Data, determining suitable Data Cleanup, Scripting the Cleanup, Testing with New Data.

UNIT–IV:**DATA EXPLORATION AND ANALYSIS**

Exploring Data, Importing Data, Exploring Table Functions, Joining Numerous Datasets, Identifying Correlations, Identifying Outliers, Creating Groupings, Analyzing Data - Separating and Focusing the Data, Presenting Data, Visualizing the Data, Charts, Time-Related Data, Maps, Interactives, Words, Images, Video, and Illustrations, Presentation Tools, Publishing the Data- Open-Source Platforms.

UNIT– V:**WEB SCRAPING**

What to Scrape and How, analyzing a Web Page, Network/Timeline, interacting with JavaScript, In-Depth Analysis of a Page, Getting Pages, Reading a Webpage-Reading a Web Page with LXML and XPath, Advanced Web Scraping - Browser-Based Parsing, Screen Reading with Selenium, Screen Reading with Ghost. Py, Spidering the Web-Building a Spider with Scrapy, Crawling Whole Websites with Scrapy

TEXTBOOKS:

1. Jacqueline Kazil & Katharine Jarmul, "Data Wrangling with Python", O'Reilly Media Inc., 2016.

REFERENCE BOOKS:

1. Dr. Tirthajyoti Sarkar, Shubha deep, "Data Wrangling with Python: Creating actionable data from raw sources", Packt Publishing Ltd., 2019.
2. Stefanie Molin, "Hands-On Data Analysis with Pandas", Packt Publishing Ltd., 2019
3. Allan Visochek, "Practical Data Wrangling", Packt Publishing Ltd., 2017
4. Tye Rattenbury, Joseph M. Hellerstein, Jeffrey Heer, Sean Kandel, Connor Carreras, "Principles of Data Wrangling: Practical Techniques for Data Preparation", O'Reilly Media Inc., 2017

WEB REFERENCES:

1. <http://www.gbv.de/dms/ilmenau/toc/827365454.PDF>
2. <https://www.udemy.com/course/data-wrangling-with-python/>
3. <http://www.openculture.com/free-online-data-science-courses>
4. <https://www.classcentral.com/course/dataanalysiswithpython-11177>

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE14)NATURAL LANGUAGE PROCESSING
(Professional Elective -V)

IV Year B.Tech II-Sem

L T P C

3 0 0 3

Prerequisites:

Data structures, finite automata and probability theory

Course Objectives:

- Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.

Course Outcomes:

At the end of course student will be able to-

- Understand linguistic phenomena and apply formal grammars to model syntactic structures in natural language processing systems.
- Apply experimental methodology for training, evaluating, and testing empirical NLP systems.
- Manipulate and model probabilities, constructing statistical models over strings and trees for language processing tasks.
- Design and implement both supervised and unsupervised learning techniques to estimate parameters and optimize NLP models.
- Design and implement various algorithms for NLP tasks, including text classification, named entity recognition, and parsing.
- Develop, evaluate, and optimize language modeling techniques, including n-grams, neural networks, and other approaches for text generation and language understanding.

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

UNIT – II

Syntax Analysis: Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

UNIT - III

Semantic Parsing: Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

UNIT - IV

Predicate-Argument Structure, Meaning Representation Systems, Software.

UNIT - V

Discourse Processing: Cohension, Reference Resolution, Discourse Cohension and Structure Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and

Crosslingual Language Modeling

TEXT BOOKS:

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary

REFERENCE BOOK:

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PE08) SOFTWARE PROCESS AND PROJECT MANAGEMENT
(PROFESSIONAL ELECTIVE – VI)

B.Tech. IV Year I Sem.

L T P C

3 0 0 3

Course Objectives:

- To acquire knowledge on software process management
- To acquire managerial skills for software project development
- To understand software economics

Course Outcomes:

At the end of course student will be able to-

1. Understand software process maturity models (CMM, CMMI, PSP, TSP) and assess software process capabilities at various maturity levels.
2. Analyze conventional and modern software project management approaches, focusing on the evolution and economics of software development.
3. Identify and describe software life-cycle phases and their associated process artifacts for effective project planning and execution.
4. Apply software process workflows, iteration planning, and milestone tracking to manage iterative development projects.
5. Evaluate organizational structures, process automation, and software metrics for improved project control and quality assurance.
6. Critically assess modern project case studies (e.g., CCPDS-R) and propose best practices for future software project management.

UNIT – I

Software Process Maturity Software maturity Framework, Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process. Process Reference Models Capability Maturity Model (CMM), CMMI, PCMM, PSP, TSP).

UNIT – II

Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way. Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model-based software architectures.

UNIT – III

Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, minor milestones, periodic status assessments. Process Planning Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

UNIT – IV

Project Organizations Line-of- business organizations, project organizations, evolution of organizations,

process automation. Project Control and process instrumentation The seven-core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, metrics automation.

UNIT – V CCPDS-R Case Study and Future Software Project Management Practices Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

TEXT BOOKS:

1. Managing the Software Process, Watts S. Humphrey, Pearson Education
2. Software Project Management, Walker Royce, Pearson Education

REFERENCE BOOKS:

1. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000 R22 B.Tech. CSE Syllabus JNTU Hyderabad Page 136 of 154
2. Process Improvement essentials, James R. Persse, O'Reilly, 2006
3. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
4. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.
2. Software Engineering Project Management, Richard H. Thayer & Edward Yourdon, 2nd edition, Wiley India, 2004.
3. Agile Project Management, Jim Highsmith, Pearson education, 2004.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE10) AUGMENTED REALITY AND VIRTUAL REALITY
PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem

L T P C
3 0 0 3

Course objectives:

- The objective of this course is to provide a foundation to the fast-growing field of AR and make the students aware of the various AR devices.
- To give historical and modern overviews and perspectives on virtual reality. It describes the fundamentals of sensation, perception, technical and engineering aspects of virtual reality systems.

Course Outcomes:

- Understand the fundamental concepts of Augmented Reality (AR) and Virtual Reality (VR), including the history, definitions, and differences between the two technologies.
- Analyze and describe the components and devices used in AR systems, including tracking systems, display technologies, and scene generators.
- Identify and evaluate key human physiological and perceptual factors in designing immersive VR systems, such as input/output interfaces and sensory displays.
- Design and implement basic AR and VR applications using different representation techniques for visual, aural, and haptic experiences.
- Evaluate and apply virtual world representation techniques in VR, including visual, aural, and haptic aspects, using case studies like the GHOST toolkit for haptic development.
- Apply visual perception principles and rendering techniques (e.g., ray tracing, shading models) to improve the realism and performance of VR/AR systems.

UNIT - I:

Introduction to Augmented Reality: What Is Augmented Reality - Defining augmented reality, history of augmented reality, The Relationship Between Augmented Reality and Other Technologies-Media, Technologies, Other Ideas Related to the Spectrum Between Real and Virtual Worlds, applications of augmented reality Augmented Reality Concepts- How Does Augmented Reality Work? Concepts Related to Augmented Reality, Ingredients of an Augmented Reality Experience.

UNIT - II:

AR Devices & Components: AR Components – Scene Generator, Tracking system, monitoring system, display, Game scene. AR Devices – Optical See- Through HMD, Virtual retinal systems, Monitor bases systems, Projection displays, Video see-through systems.

UNIT - III:

Introduction to Virtual Reality: Defining Virtual Reality, History of VR, Human Physiology and Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, Interface to the Virtual World-Input

& output- Visual, Aural & Haptic Displays, Applications of Virtual Reality

UNIT - IV:

Representing the Virtual World: Representation of the Virtual World, Visual Representation in VR, Aural Representation in VR and Haptic Representation in VR, Case Study: GHOST (General Haptics Open Software Toolkit) software development toolkit.

UNIT - V:

Visual Perception & Rendering: Visual Perception - Perception of Depth, Perception of Motion, Perception of Color, Combining Sources of Information, Visual Rendering -Ray Tracing and Shading Models, Rasterization, Correcting Optical Distortions, Improving Latency and Frame Rates.

TEXT BOOKS:

1. Allan Fowler-AR Game Developmentl, 1st Edition, A press Publications, 2018.
2. Augmented Reality: Principles & Practice by Schmalstieg / Hollerer, Pearson Education India; First edition (12 October 2016).

REFERENCES:

1. Virtual Reality, Steven M. LaValle, Cambridge University Press, 2016.
2. Understanding Virtual Reality: Interface, Application and Design, William R Sherman and Alan B Craig, (The Morgan Kaufmann Series in Computer Graphics)". Morgan Kaufmann Publishers, San Francisco, CA, 2002.
3. Developing Virtual Reality Applications: Foundations of Effective Design, Alan B Craig, William R Sherman and Jeffrey D Will, Morgan Kaufmann, 2009.
4. Designing for Mixed Reality, Kharis O'Connell Published by O'Reilly Media, Inc., 2016.
5. Sanni Siltanen- Theory and applications of marker-based augmented reality. Julkaisija – Utgivare Publisher. 2012.
6. Gerard Jounghyun Kim, "Designing Virtual Systems: The Structured Approach", 2005.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**(2412PE06)E-COMMERCE (PROFESSIONAL ELECTIVE – VI)****B.Tech. IV Year I Sem.****L T P C****Course Code:****3 0 0 3****Course Objectives:**

- Identify the major categories and trends of e-commerce applications.
- Identify the essential processes of an e-commerce system.
- Identify several factors and web store requirements needed to succeed in e-commerce.
- Discuss the benefits and trade-offs of various e-commerce clicks and bricks alternatives.
- Understand the main technologies behind e-commerce systems and how these technologies interact. Discuss the various marketing strategies for an online business.
- Define various electronic payment types and associated security risks and the ways to protect against them.

Course Outcomes:

- Ability to identify the business relationships between the organizations and their customers
- Ability to perform various transactions like payment, data transfer and etc.

UNIT – I

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, 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. Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT - III

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. 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

UNIT – IV

Web Marketing Strategies, Communicating with Different Market Segments, Beyond Market Segmentation: Customer Behavior and Relationship Intensity, Advertising on the Web, EMail Marketing, Search Engine Positioning and Domain Names, Selling to Businesses Online, Electronic Data Interchange, Supply Chain Management Using Internet Technologies, Electronic Marketplaces and Portals

UNIT - V

E-Business Revenue Models, Revenue Models for Online Business, Changing Strategies: Revenue Models in Transition, Revenue Strategy Issues for Online Businesses, Creating an Effective Business Presence Online, Web Site Usability, Virtual Communities, Mobile Commerce, Online Auctions

TEXT BOOK:

2. Frontiers of electronic commerce – Kalakata, Whinston, Pearson. (UNITS 1, 2, 3)
3. E-Business by Gary P. Schneider, - Cengage India Learning (UNITS 4, 5)

REFERENCES:

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, John Wiley.
2. E-Commerce, S. Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H. Michael Chang.
4. Electronic Commerce – Gary P. Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C. Taudon, Carol Guyerico Traver.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2462PE17)DIGITAL FORENSICS
PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

L T P C

3 0 0 3

Course Objectives: To analyze how to conduct a digital forensics investigation and validate forensics data.

Course Outcomes:

1. Understand what is a Digital Investigation is, the sources of digital evidence, and the limitations of forensics.
2. Analyze how to design software to support forensics.
3. Understand the legal frameworks, regulations, and compliance requirements governing the use of seized data in digital forensics and information security.
4. Identify the key legal and ethical considerations that must be followed when handling and utilizing seized data.
5. Analyze the entire process of evidence seizure, from the identification of the need for seizure to ensuring the proper documentation and chain of custody during the process.
6. Demonstrate the appropriate steps in the disposition of seized data, ensuring that the legal requirements, data integrity, and proper storage procedures are maintained throughout the process.

UNIT- I

Digital forensics concepts: What is forensics? Branches and applications of digital forensics. Overview of forensics principles: scientific method, evidence principles, documentation, reporting & testimony. Sociological and Legal Aspects of Digital Forensics Introduction to Incident - Incident Response Methodology –Steps - Activities in Initial Response, Phase after detection of an incident

UNIT – II

Initial Response and forensic duplication, Initial Response & Volatile Data Collection from Windows system -Initial Response & Volatile Data Collection from Unix system – Forensic Duplication: Forensic duplication: Forensic Duplicates as Admissible Evidence, Forensic Duplication Tool Requirements, Creating a Forensic. Duplicate/Qualified Forensic Duplicate of a Hard Drive

UNIT - III

Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

UNIT - IV

Current Forensic tools: evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools. Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

UNIT - V

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

TEXT BOOKS

1. Incident Response and computer forensics, Kevin Mandia, Chris Prosise, Tata McGrawHill, 2006.
2. Computer Forensics, Computer Crime Investigation, John R. Vacca, Firewall Media, New Delhi.
3. Computer Forensics and Investigations, Nelson, Phillips Enfinger, Steuart, cengage

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2 4 6 7 P E 15) BIG DATA ARCHITECTURE-SPARK
PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

L T P C

3 0 0 3

COURSE OBJECTIVES

- To introduce the terminology, technology and its applications
- To introduce the concept of Analytics and Visualization
- To demonstrate the Big Data Architecture and its components, tools
- To provide knowledge about Apache Spark.
- To provide wild understanding about the databases and Hadoop systems.

COURSE OUTCOMES:

Upon successful completion of the course, the student is able to

- Identify Big Data and its Business Implications.
- Categorize and summarize Big Data and its importance.
- Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce in big data analytics
- Compare various file systems and use an appropriate file system for storing different types of data.
- Connect to various web data sources for gathering data and integrate these sources with Hadoop components for efficient large-scale data processing.
- Implement and process streaming data using Hadoop components, leveraging appropriate tools and techniques for real-time data analytics.

UNIT-I

Big Data Introduction: Classification of Digital Data, Structured and Unstructured Data, Introduction to Big Data: Characteristics – Evolution – Definition - Challenges with Big Data -Other Characteristics of Data, Why Big Data-Traditional Business Intelligence versus Big Data, Importance of Big Data.

UNIT-II:

Big Data Architecture Introduction: Big Data Architecture-Definition, Why Big Data Architecture. Evolution of Big Data Architecture. Market Trends. Big Data Architecture and Its Sources. Big Data Architecture Use Cases.

UNIT-III

Big Data architecture components: Data ingestion, Data storage, Data Computing, Data Analysis, Data Visualization. Understanding the Lambda architecture, HBase, Spark Libraries, Spark Streaming.

UNIT-IV

Introducing Apache Spark : Introduction to Spark, Spark Architecture and its components, Features of Spark, Spark vs Hadoop, Challenges of Spark.

UNIT-V

Introduction To Technology Landscape NoSQL, Comparison of SQL and NoSQL, Hadoop-

RDBMS Versus Hadoop-Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem.

TEXT BOOKS:

1. Tom White—Hadoop:The Definitive Guide |Third Editon, O_reily Media,2012.
2. Seema Acharya, Subhasini Chellappan, "Big Data Analytics "Wiley2015.

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.
4. GlenJ.Myat,—MakingSenseofData|,JohnWiley&Sons,2007
5. Pete Warden, —Big Data Glossary|, O_Reily, 2011.
6. Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications,2013.
7. ArvindSathi,—Big Data Analytics: Disruptive Technologies for Changing the Gamell, MC Press,2012
8. Paul Zikopoulos ,Dirk DeRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles ,David Corigan, "Harness the Power of Big Data The IBM Big Data Platform", Tata McGraw Hill Publications

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2466PE06) GENERATIVE AI
PROFESSIONAL ELECTIVE – VI

B.Tech. IV Year II Sem.

L T P C
3 0 0 3

Course Objectives:

- a. To familiarize students on the concept of Generative Modelling
- b. To understand the encoding & decoding mechanisms in Variational Auto encoders.
- c. To gain knowledge on Generative Adversarial Networks.
- d. To learn the fundamentals of Autoregressive models & Transformers.
- e. To assess the emerging market of Generative Artificial Intelligence.

Course Outcomes:

At the end of course student will be able to-

- Understand the core concepts of generative modeling, its distinction from discriminative modeling, and its role in the broader field of artificial intelligence.
- Design and implement Variational Autoencoders (VAEs), analyze their architecture, and apply them to real-world data generation tasks.
- Develop and evaluate Generative Adversarial Networks (GANs), including advanced variants such as DCGAN and WGAN-GP, with hands-on experimentation.
- Construct and train autoregressive models like LSTMs and understand the architecture and functionality of transformer-based models like GPT.
- Analyze the evolution and current landscape of generative AI, including the rise of large language models, text-to-image, and text-to-code generation technologies.
- Evaluate the ethical implications and future applications of generative AI in sectors such as education, the workplace, and everyday life.

UNIT – I:

Generative Modeling: Generative Modeling, Generative Versus Discriminative Modeling, The rise of Generative Modeling, Generative Modeling and AI, Building a Generative Model, Core Probability Theory, Generative Model Taxonomy, Case Study: The Generative Deep Learning Codebase, Cloning the Repository, Using Docker, Running on a GPU.

UNIT - II:

Variational Auto encoders (VAE): Introduction, Auto encoders: Architecture, The Encoder, The Decoder, Joining the Encoder to the Decoder, Training & Analysis of the Auto Encoder, Case Study – The Variational Art Exhibition, VAE: Building a VAE, Analysis of the VAE, Case Study – Using VAE to generate faces.

UNIT – III:

Generative Adversarial Networks (GAN): Introduction, Deep Convolutional GAN (DC-GAN): Discriminator, Generator, Training & Analysis of DCGAN, Case Study - Wasserstein GAN with Gradient Penalty (WGAN - GP): Wasserstein Loss, The Lipschitz Constraint, Weight Clipping, The Gradient Penalty (GP) Loss, Training & Analysis of the WGAN - GP.

UNIT - IV:

Autoregressive Models & Transformers: Introduction, Long Short-Term Memory Network (LSTM): The Recipes Dataset, Working with Text Data, Tokenization, Creating the Training Set, The LSTM Architecture, The Embedding Layer, The LSTM Layer, The LSTM Cell, Training & Analysis of the LSTM, Transformers – Introduction, GPT: The Wine Reviews, Dataset, Attention, Queries, Keys, and Values, Multihead Attention, Causal Masking, The Transformer Block, Positional Encoding, Training & Analysis of GPT.

UNIT - V:

Timeline & Future Scope of Generative AI: 2014–2017: The VAE and GAN Era, 2018–2019: The Transformer Era, 2020–2022: The Big Model Era, The Current State of Generative AI: Large Language Models (LLM's), Text-to-Code Models, Text-to-Image Models, Other Applications, The Future of Generative AI: Generative AI in Everyday Life, Generative AI in the Workplace, Generative AI in Education, Generative AI Ethics and Challenges.

TEXT BOOK:

1. GENERATIVE DEEP LEARNING Teaching Machines to Paint, Write, Compose and Play David Foster - O'Reilly - 2nd Edition.

REFERENCES:

Generative AI in Practice – Bernard Marr – Wile.

IT-OPEN ELECTIVES (R24)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412OE01) COMPUTER ARCHITECTURE
(Open Elective - I)

III Year B.Tech. IT I-Sem

L T P C
3 0 0 3

Prerequisites:

Computer Organization

Course Objectives

- To impart the concepts and principles of parallel and advanced computer architectures.
- To develop the design techniques of Scalable and multithreaded Architectures
- To Apply the concepts and techniques of parallel and advanced computer architectures to design modern computer systems

Course Outcomes:

- Understand the theory of parallelism and different parallel computer models.
- Analyze performance metrics and scalability issues in parallel computing systems.
- Understand memory organization, pipelining techniques, and processor technologies.
- Understand the architecture of multiprocessors, multicomputer, and SIMD systems.
- Analyze synchronization, cache coherence, and message-passing mechanisms.
- Understand scalable, multithreaded, and dataflow architectures and their applications.

UNIT - I

Theory of Parallelism, Parallel computer models, The State of Computing, Multiprocessors and Multicomputers, Multivector and SIMD Computers, PRAM and VLSI models, Architectural development tracks, Program and network properties, Conditions of parallelism, Program partitioning and Scheduling, Program flow Mechanisms, System interconnect Architectures.

UNIT - II

Principals of Scalable performance, Performance metrics and measures, Parallel Processing applications, Speed up performance laws, Scalability Analysis and Approaches, Hardware Technologies, Processes and Memory Hierarchy, Advanced Processor Technology, Superscalar and Vector Processors, Memory Hierarchy Technology, Virtual Memory Technology.

UNIT – III

Bus Cache and Shared memory, Backplane bus systems, Cache Memory organizations, SharedMemory Organizations, Sequential and weak consistency models, Pipelining and superscalar techniques, Linear Pipeline Processors, Non-Linear Pipeline Processors, Instruction Pipeline design, Arithmetic pipeline design, superscalar pipeline design.

UNIT – IV

Parallel and Scalable Architectures, Multiprocessors and Multicomputers, Multiprocessor system interconnects, cache coherence and synchronization mechanism, Three Generations of Multicomputers,

Message-passing Mechanisms, Multivector and SIMD computers, Vector Processing Principals, Multivector Multiprocessors, Compound Vector processing, SIMD computer Organizations, The connection machine CM-5,

UNIT – V

Scalable, Multithreaded and Dataflow Architectures, Latency-hiding techniques, Principals of Multithreading, Fine-Grain Multicomputers, Scalable and multithreaded Architectures, Dataflow and hybrid Architectures.

TEXT BOOK:

1. Advanced Computer Architecture Second Edition, Kai Hwang, Tata McGraw Hill Publishers.

REFERENCE BOOKS:

1. Computer Architecture, Fourth edition, J. L. Hennessy and D.A. Patterson. ELSEVIER.
2. Advanced Computer Architectures, S.G. Shiva, Special Indian edition, CRC, Taylor & Francis.
3. Introduction to High Performance Computing for Scientists and Engineers, G. Hager and G. Wellein, CRC Press, Taylor & Francis Group.
4. Advanced Computer Architecture, D. Sima, T. Fountain, P. Kacsuk, Pearson education.
5. Computer Architecture, B. Parhami, Oxford Univ. Press

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE02- Cloud Architecture and Services
(Open Elective - I)

III Year B.Tech. IT I-Sem

L T P C
3 0 0 3

Course Objectives

- Understand core concepts, service models, and deployment strategies in cloud computing.
- Analyze and apply cloud security, identity management, and provider-specific solutions like AWS

Course Outcomes:

- Understand the fundamentals and evolution of cloud computing.
- Understand cloud service and deployment models with their features and limitations.
- Analyze cloud architecture and service models like SaaS, PaaS, and IaaS.
- Compare major cloud providers (AWS, Azure, GCP) and their core services.
- Analyze identity and access management principles in cloud environments.
- Analyze cloud security, privacy, compliance, and legal aspects.

UNIT - I

Introduction to Cloud Technologies Introduction to cloud computing, history of cloud computing features of cloud computing, cloud service models, cloud deployment models, concept of virtualization, cloud platforms, comparison of cloud providers, limitations.

UNIT - II

Cloud Architecture- Layers and Models Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features of IaaS and benefits, Service providers, challenges and risks in cloud adoption. Cloud deployment model: Public clouds, Private clouds, Community clouds, Hybrid clouds, Advantages and limitation of deployment model

UNIT – III

AWS history, AWS global Infrastructure, AWS services, AWS ecosystem, comparison of AWS, Azure and Google cloud.

UNIT – IV

Identity and Access Management and compliance: Users groups and roles - Understanding credentials, Security policies , IAM abilities and limitations, AWS physical security - AWS compliance initiatives, Understanding public/private keys, Other AWS security capabilities

UNIT – V

Security Management in the Cloud Security Management Standards, Security Management in the Cloud, Availability Management: SaaS, PaaS, IaaS, Privacy Issues Privacy Issues, Data Life Cycle, Key Privacy Concerns in the Cloud Protecting Privacy, Changes to Privacy Risk Management and Compliance in Relation to Cloud Computing, Legal and Regulatory Implications, U.S. Laws and Regulations, International Laws and Regulations.

TEXT BOOK:

1. Rajkumar Buyya By Mastering Cloud Computing: Foundations and Applications Programming
2. T. velte by Cloud Computing
3. robbin bloor by Cloud Computing for dummies

REFERENCE BOOKS:

- **"Cloud Computing: Concepts, Technology & Architecture"** *Authors:* Thomas Erl, Ricardo Puttini, Zaigham Mahmood *-Publisher:* Prentice Hall
- **"Cloud Computing: Principles and Paradigms"** *Editors:* Rajkumar Buyya, James Broberg, Andrzej Goscinski, *Publisher:* Wiley

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**2412OE03- Open Source Software Development****(Open Elective - I)****III Year B.Tech. IT I-Sem****L T P C****3 0 0 3****Course Objectives**

- To introduce the principles, methodologies, and philosophies of open source software and development.
- To explore real-world applications, licensing, and ethical issues related to open source technologies.

Course Outcomes:

- Understand the fundamentals and philosophy of open source software.
- Identify principles, methodologies, and licenses in open source development.
- Analyze legal, ethical, and economic aspects of open source technologies.
- Evaluate real-world open source projects through case studies.
- Learn how to start and manage open source projects across various domains.
- Compare open vs closed source models and assess their societal impact.

UNIT- I

Introduction – Why Open Source – Open Source –Principles, Standards Requirements, Successes – Free Software – FOSS – Internet Application Projects

UNIT- II

Open source – Initiatives, Principles, Methodologies, Philosophy, Platform, Freedom, OSSD, Licenses – Copy right, Copy left, Patent, Zero Marginal Technologies, Income generation opportunities, Internalization

UNIT- III

Case Studies – Apache, BSD, Linux, Mozilla (Firefox), Wikipedia, Joomla, GCC, Open Office.

UNIT- IV

Open Source Project –Starting, Maintaining –Open Source – Hardware, Design, Teaching & Media

UNIT- V

Open Source Ethics – Open Vs Closed Source – Government – Ethics – Impact of Open source Technology – Shared Software – Shared Source

TEXT BOOK:

1. Kailash Vadera, Bhavyesh Gandhi, “Open Source Technology”, Laxmi Publications Pvt Ltd 2012, 1st Edition.

REFERENCE BOOK:

1. Fadi P. Deek and James A. M. McHugh, “Open Source: Technology and Policy”, Cambridge Universities Press 2007

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE04- ADVANCED COMPUTER NETWORKS
(Open Elective - I)

III Year B.Tech. IT I-Sem

L T P C
3 0 0 3

Course Objectives:

- To introduce the fundamental various types of computer networks.
- To demonstrate the TCP/IP and OSI models with merits and demerits.
- To explore the various layers of OSI Model.
- To introduce UDP and TCP Models.
- To introduce Encryption Security Mechanism.

Course Outcomes:

- Describe data communication models, connection types, topologies, and protocols including OSI and ISO standards.
- Apply multiplexing and switching techniques to evaluate media technologies at the physical layer.
- Use error detection and correction methods like LRC, CRC, and Hamming code to improve data link reliability.
- Interpret network layer protocols such as ICMP, IGMP, and routing protocols for logical addressing and routing.
- Compare TCP and UDP in terms of data delivery, flow control, congestion control, and QoS.
- Interpret network-based applications using application layer protocols and ensure security via PGP and SSH.

UNIT – I

Data Communications: Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies – Protocols and Standards – ISO / OSI model, Physical layer: Transmission modes, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks and Virtual Circuit Networks.

UNIT – II

Data link layer: Introduction, Framing, and Error – Detection and Correction – Parity – LRC– CRC Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. 11 Medium Access sub layer: ALOHA, CSMA/CD,

LAN–Ethernet IEEE 802.3, IEEE 802.5 – IEEE 802.11, Random Access, Controlled Access

UNIT – III

Network layer: Logical Addressing, Internetworking, Tunneling, Address mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.

UNIT – IV

Transport Layer: Process to Process Delivery, UDP and TCP protocols, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

UNIT – V

Application Layer: Domain name space, DNS in internet, electronic mail, SMTP, FTP, WWW, HTTP, SNMP, Security – PGP – SSH.

TEXT BOOKS:

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition TMH, 2006.
2. Computer Networks, Andrew S Tanenbaum, 4th Edition. Pearson Education, PHI.

REFERENCES:

1. Data communications and Computer Networks, P.C .Gupta, PHI.
2. An Engineering Approach to Computer Networks, S. Keshav, 2nd Edition, Pearson Education.
3. Understanding communications and Networks, 3rd Edition, W.A. Shay, Cengage Learning.
4. Computer Networking: A Top-Down Approach Featuring the Internet. James F. Kurose & Keith W. Ross, 3rd Edition, Pearson Education.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE05- Front End UI and Frame Work
(Open Elective - I)

III Year B. Tech II Sem

L T P C
3 0 0 3

Course Objectives:

- To introduce students to the core concepts of web development, including HTML, CSS, JavaScript, and responsive design principles for creating interactive and user-friendly web interfaces.
- To enable students to apply modern front-end frameworks like React and Angular in building dynamic, efficient, and scalable web applications with a focus on performance and best practices.

Course Outcomes:

- Understand the basics of HTML, CSS, and JavaScript for front-end development.
- Create responsive web designs using CSS and implement various CSS frameworks.
- Develop interactive and dynamic web applications using React or Angular.
- Implement client-server communication using JavaScript (AJAX, Fetch, JSON).
- Optimize web performance, follow best coding practices, and implement security measures.
- Deploy web applications to live servers and use version control for project management.

UNIT I: Introduction to Web Development

Overview of Web Technologies: Web applications, web servers and browsers

HTML (Hypertext Markup Language): Basic structure of an HTML document, Forms, tables, lists, links, and images, HTML5 semantic elements.

CSS (Cascading Style Sheets): Styling HTML elements, color, borders, margins, padding, CSS3: Transitions, animations, transformations, Box model, positioning, Flex box, Grid systems,

UNIT II: Advanced CSS & JavaScript

CSS Preprocessors: SASS, LESS

CSS Frameworks: Bootstrap, Tailwind CSS

JavaScript (JS): Variables, data types, operators, control structures, Functions, objects, arrays, and events, DOM manipulation: Select, modify, and traverse DOM elements

Asynchronous JavaScript: Promises, async/await, AJAX

UNIT III: JavaScript Frameworks

Introduction to Frameworks: Why frameworks are used in front-end development

React.js: Components, props, and state, JSX (JavaScript XML), Virtual DOM, Event handling, form handling, React Router for navigation, Redux for state management, Lifecycle methods, Handling APIs with Axios

Angular: Modules, components, services, Two-way data binding, Directives, pipes, and services, RxJS and Observables, Angular routing and forms, Dependency Injection

UNIT IV: Advanced Web Development Concepts

Single Page Applications (SPA): Routing, navigation, and dynamic content loading, Using React Router or Angular Router

Node.js Basics: Introduction to Node.js for full-stack development, Setting up a simple server with Express.js

Version Control: Git basics: Repositories, branches, commits, Collaborative workflows with GitHub

Web Performance Optimization: Lazy loading, image optimization, code splitting, Caching strategies

UNIT V: Application Deployment & Best Practices

Testing: Unit testing in React (Jest, React Testing Library), End-to-end testing with Cypress or Selenium.

Web Security Basics: HTTPS, Content Security Policy (CSP), Cross-Origin Resource Sharing (CORS), Protection against XSS and CSRF attacks

Deployment: Deployment on platforms like Netlify, Vercel or AWS, Continuous Integration and Continuous Deployment (CI/CD) practices

TEXT BOOKS:

1. Software Testing techniques – Boris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr. K. V. K. K. Prasad, Dreamtech.

REFERENCE BOOKS:

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing, 3rd edition, P.C. Jorgensen, Aurbach Publications (Dist. by SPD).
3. Software Testing, N. Chauhan, Oxford University Press.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE06-DIGITAL FORENSICS
(Open Elective - II)

III Year B.Tech. II-Sem

L T P C
3 0 0 3

Course Objectives:

- A brief explanation of the objective is to provide digital evidences which are obtained from digital media.
- In order to understand the objectives of computer forensics, first of all, people have to recognize the different roles computer plays in a certain crime.
- According to a snippet from the United States Security Service, the functions computer has in different kinds of crimes.

Course Outcomes:

- Understand the nature, types, and impact of cybercrimes in modern digital environments.
- Apply incident response methodologies and conduct effective initial response activities.
- Perform forensic duplication and collect volatile data from Windows and Unix systems.
- Analyze and validate forensic data, addressing data-hiding and remote acquisition techniques.
- Utilize network forensic tools, email investigation techniques, and mobile device forensics.
- Work with Windows and DOS file systems and understand system-level forensic analysis including registry and startup tasks.

UNIT- I

Introduction of Cybercrime: Types, The Internet spawns crime, Worms versus viruses, Computers' roles in crimes, Introduction to digital forensics, Introduction to Incident - Incident Response Methodology –Steps - Activities in Initial Response, Phase after detection of an incident.

UNIT- II

Initial Response and forensic duplication, Initial Response & Volatile Data Collection from Windows system -Initial Response & Volatile Data Collection from Unix system – Forensic Duplication: Forensic duplication: Forensic Duplicates as Admissible Evidence, Forensic Duplication Tool Requirements, Creating a Forensic. Duplicate/Qualified Forensic Duplicate of a Hard Drive

UNIT- III

Computer forensic analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

Network Forensics: Network forensic overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

UNIT- IV

Current Computer Forensic Tools: evaluating computer forensic tool needs, computer forensic software tools, computer forensic hardware tools, validating and testing forensic software.

E-mail investigations: Exploring the role of email in investigations, exploring the role of client and server in email, investigating email crimes and violations, understanding email servers, using specialized email forensic tools.

Cell phone and mobile device forensics: Understanding mobile device forensic, understanding acquisition procedures for cell phones and mobile devices.

UNIT- V

Working with windows and dos systems: understanding file systems, exploring Microsoft file structures examining NTFS disks, understanding whole disk encryption, windows registry, Microsoft startup tasks, MS Dos startup tasks, virtual machines.

TEXTBOOKS:

- Computer Forensics, Computer Crime Investigation by John R,Vacca, Firewall Media, New Delhi.
- Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning.

REFERENCE BOOKS:

1. Real Digital Forensics by Keith j. Jones, Richard Bejtlich, Curtis W.Rose ,Addison-Wesley PearsonEducation
2. Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brain Jenkinson, Springer Internationaledition
3. Computer Evidence Collection & Presentation by Chrostopher L.T. Brown, FirewallMedia
4. Homeland Security, Techniques & Technologies by Jesus Mena, FirewallMedia.
5. SoftwareForensicsCollectingEvidencefromtheSceneofaDigitalCrimebyRobertM.Slade, TMH 2005
6. Windows Forensics by Chad Steel, Wiley IndiaEdition.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**2412OE07-Algorithms Design and Analysis****(Open Elective - II)****III Year B.Tech. II-Sem****L T P C****3 0 0 3****Course Objectives:**

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.

Course Outcomes:

- Understand algorithm efficiency through time and space complexity analysis
- Use divide-and-conquer techniques for sorting and matrix multiplication
- Able to synthesize disjoint set operations and Understand Tree Traversal method
- Apply Greedy Algorithms and Dynamic Programming concept to solve various problems
- Apply Backtracking, Branch and Bound concept to solve various problems.
- Recognize and classify NP-Hard and NP-Complete problems by analyzing non-deterministic algorithms, Cook's theorem, and complexity classes.

UNIT - I

Introduction: Algorithm definition, Algorithm Specification, Performance Analysis-Space complexity, Time complexity, probabilistic analysis Randomized Algorithms.

Divide and Conquer: General method, applications - Binary search, Merge sort, Quick sort, Strassen's Matrix Multiplication.

UNIT - II

Disjoint Set Operations: union and find algorithms, Efficient non-recursive binary tree traversal algorithms, spanning trees, graph traversals- BFS and DFS, AND/OR graphs, Game Tree, Connected Components and Spanning trees, Bi-connected components

UNIT - III

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

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

UNIT - IV

Backtracking: General method, applications - The 8-queen problem, sum of subsets problem, graph colouring, Hamiltonian cycles.

Branch and Bound: General Method, applications-0/1 Knapsack problem, LC Branch and Bound solution, travelling sales person problem.

UNIT - V

NP- Hard and NP-Complete Problems: Basic concepts, Non-deterministic algorithms, NP - Hard and NP- Complete classes, Cook's theorem.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, Sartaj Sahni and S.
2. Raja sekharan, Universities Press.
3. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, 2nd edition, Pearson Education.

REFERENCE BOOKS:

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press
3. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
4. Foundations of Algorithms, R. Neapolitan and K. Naimipour, 4th edition, Jones and Bartlett Student edition.
5. Introduction to Algorithms, 3rd Edition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, PHI

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2412OE08) ANDROID APPLICATION DEVELOPMENT
(Open Elective - II)

III Year B.Tech. II-Sem

L T P C
3 0 0 3

Course Objectives:

- To provide students with a comprehensive understanding of Android application architecture, design principles, development tools, and deployment techniques.
- To equip students with hands-on experience in building, testing, and publishing Android applications using common Android APIs and user interface components.

Course Outcomes:

- Understand the Android platform, SDK, and project structure to build basic Android applications.
- Design and implement Android components such as Activities, Services, and Intents while managing application context and permissions.
- Create responsive and interactive user interfaces using layouts, views, and animation in Android.
- Test, debug, and publish Android applications while effectively managing preferences and resources.
- Use Android APIs for data storage, web access, telephony, and data sharing through content providers.
- Deploy Android applications to mobile devices and the Google Play Store while adhering to best practices.

UNIT - I Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building your First Android application, Understanding Anatomy of Android Application, Android Manifest file.

UNIT - II Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

UNIT - III Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

UNIT - IV Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

UNIT - V Using Common Android APIs: Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

TEXT BOOKS:

1. T1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

1. R1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
2. R2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
3. R3. Android Application Development All in one for Dummies by Barry Burd, Edition: I

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE09- Modern Cryptography
(Open Elective - II)

III Year B.Tech. II-Sem

L T P C
3 0 0 3

Course Objectives:

1. To provide a foundational understanding of classical and modern cryptographic techniques.
2. To develop students' ability to analyze, implement, and evaluate cryptographic algorithms and protocols for secure communication.

Course Outcomes:

At the end of course student will be able to-

- **Understand classical and modern cryptographic techniques**, including symmetric and asymmetric encryption schemes.
- **Analyze the concept of perfect secrecy and the limitations of historical ciphers** like the One-Time Pad.
- **Design and evaluate private-key cryptosystems** using pseudorandom functions and secure encryption schemes.
- **Implement secure message authentication techniques** including MACs and cryptographic hash functions.
- **Understand and apply number theory concepts in public-key cryptography**, including RSA and Diffie-Hellman.
- **Evaluate digital signature schemes and key management protocols** for real-world cryptographic applications.

UNIT I: Foundations of Cryptography

Introduction to Classical and Modern Cryptography, Private-Key Encryption and Its Setting, Historical Ciphers and Cryptanalysis, Principles of Modern Cryptography, Perfectly-Secret Encryption: Definitions and Properties, One-Time Pad (Vernam's Cipher), Limitations of Perfect Secrecy

UNIT II: Private-Key Cryptography and Pseudorandomness

Introduction to Private-Key Cryptography, Computational Approach to Cryptography, Computationally Secure Encryption, Concept of Pseudorandomness, Construction of Secure Encryption Schemes

UNIT III: Message Authentication and Block Ciphers

Message Authentication Codes (MACs): Secure Communication and Message Integrity, Encryption vs. Message Authentication, Construction of Secure MACs, Collision-Resistant Hash Functions

Block Ciphers: Substitution-Permutation Networks, Feistel Networks, DES (Data Encryption Standard), AES (Advanced Encryption Standard)

UNIT IV: Public-Key Cryptography and Number Theory

- Basics of Number Theory for Cryptography, Cryptographic Hardness Assumptions, Group Theory Preliminaries, Primes, Factoring, and the RSA Algorithm, Assumptions in Cyclic Groups, Applications of Number-Theoretic Assumptions

UNIT V: Key Management, Public-Key Systems, and Digital Signatures

- Limitations of Private-Key Cryptography, Key Distribution Centers, The Public-Key Revolution, Diffie-Hellman Key Exchange, Public-Key Encryption and Hybrid Encryption, RSA Encryption, Digital Signature Schemes: RSA Signatures, Hash-and-Sign Paradigm, Lamport's One-Time Signature Scheme, Public-Key Cryptosystems in the Random Oracle Model

TEXT BOOKS:

- **"Introduction to Modern Cryptography"**, *Authors:* Jonathan Katz, Yehuda Lindell
Publisher: CRC Press
- **"Cryptography and Network Security: Principles and Practice"**, *Author:* William Stallings, *Publisher:* Pearson

REFERENCE BOOKS:

- **"Understanding Cryptography: A Textbook for Students and Practitioners"**
Authors: Christof Paar, Jan Pelzl
Publisher: Springer
- **"Applied Cryptography: Protocols, Algorithms, and Source Code in C"**
Author: Bruce Schneier
Publisher: Wiley

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**2412OE10-Soft Computing
(Open Elective - II)****III Year B.Tech. II-Sem****L T P C
3 0 0 3****Course Objectives:**

- To introduce the fundamental concepts and techniques of soft computing, including fuzzy logic, neural networks, and genetic algorithms.
- To develop the ability to apply soft computing methods to solve complex real-world problems in artificial intelligence and optimization.

Course Outcomes:

At the end of course student will be able to-

1. Differentiate between soft computing and hard computing paradigms and explain their roles in problem-solving.
2. Apply AI search strategies such as BFS, DFS, A*, and hill climbing to solve decision-making problems.
3. Explain the structure and learning processes of artificial neural networks including perceptron, ADALINE, MADALINE, and MLP.
4. Implement and analyze the working of back propagation, counter propagation, Hopfield networks, and ART models.
5. Design fuzzy inference systems using fuzzy sets, membership functions, and fuzzy rules for approximate reasoning.
6. Apply genetic algorithm concepts including selection, crossover, and mutation to solve optimization problems.

Unit –I

Soft Computing: Introduction to soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Artificial Intelligence: Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A* algorithm, AO* Algorithms and various types of control strategies. Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

Unit –II

Neural Network: Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference b/w ANN and human brain, characteristic and applications of ANN, single layer network.

Unit – III

Perceptron: Perceptron training algorithm, Linear separability, Widrow & Hebb's learning rule/Delta rule, ADALINE, MADALINE, AI v/s ANN. Introduction of MLP, different activation

functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA. Counter propagation network: architecture, functioning & characteristics of counter Propagation network, Hop field/ Recurrent network, configuration, stability constraints, associative memory, and characteristics, limitations and applications. Hopfield v/s Boltzman machine. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Associative Memory.

Unit – IV

Fuzzy Logic: Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions. Fuzzy rule base system : Fuzzy propositions, formation, decomposition & aggregation of fuzzy Rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

Unit – V

Genetic algorithm: Fundamental, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator ,Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

Text Books:

1. S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications, 2nd Edition, 2011.
2. S. Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication, 1st Edition, 2009.

References:

1. N.K.Bose, Ping Liang, Neural Network fundamental with Graph, Algorithms & Applications, TMH, 1st Edition, 1998.
2. Bart Kosko, Neural Network & Fuzzy System, PHI Publication, 1st Edition, 2009.
3. Rich E, Knight K, Artificial Intelligence, TMH, 3rd Edition, 2012.
4. George J Klir, Bo Yuan, Fuzzy sets & Fuzzy Logic, Theory & Applications, PHI Publication, 1st Edition, 2009.
5. Martin T Hagen, Neural Network Design, Nelson Candad, 2nd Edition, 2008.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**2412OE11-Deep Learning Technology****(Open Elective - II)****III Year B.Tech. II-Sem****L T P C****3 0 0 3****Course Objectives:**

- Understand the fundamentals of deep learning.
- Understanding the working of Convolutional Neural Networks and RNN in decision making

Course Outcomes:

At the end of course student will be able to-

- Describe the structure and function of neural networks and understand the biological inspiration behind them.
- Implement and analyze multilayer perceptrons using the backpropagation algorithm and its variants.
- Apply regularization techniques and understand optimization challenges in training deep neural networks.
- Design and implement convolutional neural networks (CNNs) for image processing and classification tasks.
- Develop and apply recurrent neural networks (RNNs) and their variants like LSTMs and GRUs for sequence modeling.
- Evaluate deep learning models and apply learned techniques to real-world problems involving structured data and temporal sequences.

UNIT-1

Introduction: What is a Neural Network?, The Human Brain, Models of a Neuron, Neural Networks Viewed As Directed Graphs, Feedback, Network Architectures, Rosenblatt's Perceptron: Introduction, Perceptron, The Perceptron Convergence Theorem, Relation Between the Perceptron and Bayes Classifier for a Gaussian Environment.

UNIT-2

Multilayer Perceptrons: Introduction, Batch Learning and On-Line Learning, The Back-Propagation Algorithm, XOR Problem, Heuristics for Making the Back- Propagation Algorithm Perform Better, Back Propagation and Differentiation.

UNIT-3

Regularization for Deep Learning: Parameter Norm Penalties - L2 Parameter Regularization, Dataset Augmentation, Semi-Supervised Learning. Optimization for Training Deep Models: Challenges in Neural Network Optimization – Ill Conditioning, Local Minima, Plateaus, Saddle Points and Other Flat Regions.

UNIT-4

Convolution neural networks: The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution

Function, Structured Outputs, Data Types, Efficient Convolution Algorithms, Convolutional Networks and the History of Deep Learning.

UNIT-5

Sequence Modeling: Recurrent and Recursive Nets: Unfolding Computational Graphs, Recurrent Neural Networks, Bidirectional RNNs, Encoder-Decoder Sequence-to-Sequence Architectures, Deep Recurrent Networks, Recursive Neural Networks, The Long Short-Term Memory and Other Gated RNNs

Text Book:

- "Deep Learning"-Authors: **Ian Goodfellow, Yoshua Bengio, and Aaron Courville**-Publisher: **MIT Press**

Reference Book:

- "Neural Networks and Learning Machines" (**3rd Edition**), Author: **Simon Haykin**
Publisher: **Pearson Education**

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**2412OE12- Web Mining and Analytics****(Open Elective - II)****III Year B.Tech. II-Sem****L T P C****3 0 0 3****Course Objectives:**

- To introduce fundamental concepts, techniques, and tools for mining web data and discovering useful patterns.
- To develop analytical skills in web structure, content, and usage mining along with web analytics at business scale.

Course Outcomes:

At the end of course student will be able to-

- Explain the foundational concepts and algorithms in web mining and information retrieval.
- Apply supervised, unsupervised, and partially supervised learning techniques for web content mining.
- Analyze hyperlink structures and usage data using ranking algorithms, crawling techniques, and pattern discovery.
- Understand and utilize the principles of web analytics for online advertising and user behavior analysis.
- Design a scalable web analytics framework for e-business environments using OLAP tools and platforms like Splunk.
- Perform data collection, preprocessing, and pattern discovery from web server logs and clickstream data.

UNIT I:**Introduction**

Introduction – Web Mining – Theoretical background –Algorithms and techniques – Association rule mining – Sequential Pattern Mining -Information retrieval and Web search – Information retrieval Models-Relevance Feedback- Text and Web page Pre-processing

UNIT II:**Web Content Mining**

Web Content Mining – Supervised Learning – Decision tree - Naive Bayesian Text Classification -Support Vector Machines - Ensemble of Classifiers. Unsupervised Learning - K-means Clustering -Hierarchical Clustering –Partially Supervised Learning

UNIT III:**Web Structure and Web Usage Mining**

Hyperlink based Ranking – Introduction -Social Networks Analysis- Co-Citation and Bibliographic Coupling - Page Rank -Authorities -Enhanced Techniques for Page Ranking - Community Discovery – Web Crawling -A Basic Crawler Algorithm- Implementation Issues

Web Usage Mining – sources of data- Applications -Click stream Analysis -Web Server Log Files - Data Collection and Pre Processing- Cleaning and Filtering- Data Modeling for Web Usage Mining – Issues- Discovery and Analysis of Web Usage Patterns – Used tools in Web Usage mining.

UNIT IV:

Introduction to web analytics

Motivation and historical perspective on the development of web analytics, Display and search advertising , Knowledge discovery from web data, Major computing paradigms, Typical problem formulations

UNIT V:

Web analytics at e-Business scale

Framework for mapping business needs to web analytics tasks, Data collection architecture, Introduction to OLAP, Web data exploration and reporting, Introduction to Splunk

Textbooks:

- **“Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data”,Author:** Bing Liu
Publisher: Springer
- **“Mining the Web: Discovering Knowledge from Hypertext Data”,Author: Soumen Chakrabarti**
Publisher: Morgan Kaufmann

Reference Books:

- **“Introduction to Information Retrieval”,Authors:** Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze,**Publisher:** Cambridge University Press
- **“Data Mining: Concepts and Techniques”,Authors:** Jiawei Han, Micheline Kamber, Jian Pei
Publisher: Morgan Kaufmann
- **“Web Analytics 2.0”,Author:** Avinash Kaushik,**Publisher:** Wiley

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE13-WEB DESIGN AND MANAGEMENT
(Open Elective - IV)

IV Year B.Tech. I I –Sem

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To Learn the basic concepts in HTML, CSS, Javascript
- To Understand the responsive design and development
- To learn the web project management and maintenance process
- To Design a Website with HTML, JS, CSS / CMS - Word press

COURSE OUTCOMES:

By the end of this course, students will be able to:

1. **Create a simple webpage using HTML** with appropriate structure, text markup, links, images, tables, and forms.
2. **Style web pages effectively with CSS**, including the use of colors, padding, borders, and positioning for responsive layouts.
3. **Design responsive web pages** using Sass, CSS grids, Flexbox, and frameworks, ensuring compatibility across devices and screen sizes.
4. **Use JavaScript** to add interactivity and dynamic elements to web pages, enhancing user experience.
5. **Understand web project management processes**, including project definition, scheduling, budgeting, testing, and documentation.
6. **Design, develop, and host a live website project**, implementing advanced UI transitions, aesthetics, and responsive design using tools like HTML, CSS, JavaScript, or WordPress.

UNIT I

WEB DESIGN - HTML MARKUP FOR STRUCTURE :Working of Web - HTML Markup for Structure - Creating simple page - Marking up text – Adding Links - Adding Images - Table Markup - Forms - HTML5

UNIT II

CSS AND JAVASCRIPT :CSS - Formatting text - Colours and Background - Padding, Borders and Margins - Floating and positioning - Page Layout with CSS - Transition, Transforms and Animation - Javascript - Using Java Script

UNIT III

RESPONSIVE WEB DESIGN : Sass for Responsive Web Design - Marking Content with HTML5 - Mobile-First or Desktop-First - CSS Grids, CSS Frameworks, UI Kits, and Flexbox for RWD - Designing small UIs by Large Finger - Images and Videos in Responsive Web Design - Meaningful Typography for Responsive Web Design

UNIT IV

WEB PROJECT MANAGEMENT : Project Life Cycle - Project Definition - Discovery and Requirements - Project Schedule and Budgeting - Running the project - Technical Documentation - Development , Communicaton, Documentation - QA and testing -Deployment - Support and operations

UNIT V

PROJECT CASE STUDY: Using HTML, CSS, JS or using Opensource CMS like Wordpress, design and develop a Website having Aesthetics, Advanced and Minimal UI Transitions based on the project - Host and manage the project live in any public hosting

TEXT BOOKS:

1. Jennifer Niederst Robbins, "Learning Web Design", O'REILLY 4th Edition
2. Ricardo Zea, "Mastering Responsive Web Design", PACKT Publishing, 2015
3. Justin Emond, Chris Steins, "Pro Web Project Management", Apress,2011

REFERENCES:

1. Jon Duckett, "HTML and CSS: Design and Build Websites", John Wiley and Sons, edition 2014
2. Jon Duckett, Jack Moore, "JavaScript & JQuery: Interactive Front-End Web Development", John Wiley

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
2412OE14-MACHINE LEARNING TECHNIQUES

B.Tech. IV Year II Sem

L T P C
3 1 0 3

Course Objective:

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.

Course outcomes:

At the end of the course students should be able to

- Ideate various learning models (geometric, probabilistic, logic) and analyze key concepts like generalization, error, bias, and variance in learning processes.
- Apply linear and nonlinear classification techniques (e.g., logistic regression, perceptrons, and support vector machines) and assess model performance considering generalization and overfitting.
- Implement and evaluate distance-based models (e.g., k-means clustering, k-nearest neighbours, hierarchical clustering) and advanced techniques such as ensemble learning (e.g., bagging, boosting).
- Construct and analyze decision trees and rule-based models for classification, regression, and association rule mining, understanding their use in predictive and descriptive modeling.
- Develop algorithms for passive and active reinforcement learning (e.g., temporal-difference learning, policy search), and evaluate their application in real-world scenarios like game playing and robotics.
- Examine and apply the principles of model validation and regularization in various learning techniques to mitigate overfitting and enhance model reliability.

UNIT I

FOUNDATIONS OF LEARNING

Components of learning – learning models – geometric models – probabilistic models – logic models – grouping and grading – learning versus design – types of learning – supervised – unsupervised – reinforcement – theory of learning – feasibility of learning – error and noise – training versus testing – theory of generalization – generalization bound – approximation generalization tradeoff – bias and variance – learning curve

UNIT II

INTRODUCTION TO TECHNOLOGY LANDSCAPE

Linear classification – univariate linear regression – multivariate linear regression – regularized regression – Logistic regression – perceptron's – multilayer neural networks – learning neural networks structures – support vector machines – soft margin SVM – going

beyond linearity, generalization and overfitting ,regularization ,validation.

UNIT III

DISTANCE, BASED MODELS

Nearest neighbor models ,K,means ,clustering around medoids ,silhouettes ,hierarchical clustering ,k,d trees ,locality sensitive hashing ,non-parametric regression ,ensemble learning ,bagging and random forests ,boosting ,meta learning

UNIT IV

TREE AND RULE MODELS

Decision trees ,learning decision trees ,ranking and probability estimation trees ,regression trees ,clustering trees ,learning ordered rule lists ,learning unordered rule lists, descriptive rule learning ,association rule mining ,first order rule learning.

UNIT V

REINFORCEMENT LEARNING

Passive reinforcement learning ,direct utility estimation ,adaptive dynamic programming, temporal, difference learning ,active reinforcement learning ,exploration ,learning an action utility function ,Generalization in reinforcement learning ,policy search ,applications in game playing ,applications in robot control.

TEXTBOOKS:

1. P. Flach, “Machine Learning: The art and science of algorithms that make sense of data”, Cambridge University Press, 2012. (UNIT,I to IV)
2. M. Mohri, A. Rostamizadeh, and A. Talwalkar, “Foundations of Machine Learning”, MIT Press, 2012. (UNITV)

REFERENCE BOOKS:

1. Y. S. Abu,Mostafa, M. Magdon,Ismail, and H.,T. Lin, “Learning from Data”, AMLBook Publishers,2012
2. K. P. Murphy, “Machine Learning: Aprobabilistic perspective”, MIT Press,2012
3. C. M. Bishop, “Pattern Recognition and Machine Learning”, Springer,2007.
4. T. M. Mitchell, “Machine Learning”, McGraw Hill,1997.

MALLAREDDY ENGINEERING COLLEGE FORWOMEN
2412OE15-Big Data Analytics

B.Tech. IV Year II Sem

L T P C
3 1 0 3

Course Objectives:

1. Understand the Big Data Platform and its Use cases
2. Provide an overview of Apache Hadoop
3. Provide HDFS Concepts and Interfacing with HDFS
4. Understand Map Reduce Jobs • Provide hands on Hadoop Eco System
5. Apply analytics on Structured, Unstructured Data.
6. Exposure to Data Analytics with R.

Course Outcomes:

At the end of course student will be able to-

1. Identify various types of digital data and understand the fundamentals of big data and Hadoop ecosystem.
2. Explain the design and architecture of HDFS and perform data ingestion using tools like Flume and Sqoop.
3. Describe the components and workflow of the MapReduce framework and develop basic MapReduce programs.
4. Use Pig, Hive, and HBase to process and query large datasets effectively.
5. Compare and contrast traditional database models with distributed data processing models in Hadoop.
6. Apply R programming and machine learning techniques for big data analytics using BigR.

UNIT I :

INTRODUCTION TO BIG DATA AND HADOOP :Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets.

UNIT II :

HDFS(Hadoop Distributed File System) The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, 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 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. Hbase : HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL : Introduction

UNIT V :

Data Analytics with R Machine Learning : Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering. Big Data Analytics with BigR.

TEXTBOOKS:

- **“Hadoop: The Definitive Guide”, Author:** Tom White, **Publisher:** O'Reilly Media
- **“Big Data: Principles and best practices of scalable real-time data systems”**
Author: Nathan Marz, James Warren, **Publisher:** Manning

REFERENCE BOOK:

- **Big Data Analytics with R and Hadoop”, Author:** Vignesh Prajapati, **Publisher:** Packt Publishing
- **“Data Analytics with Hadoop”, Author:** Benjamin Bengfort and Jenny Kim
Publisher: O'Reilly Media

MALLAREDDYENGINEERINGCOLLEGE FORWOMEN**2412OE16-Game Development****IV Year B. Tech II Sem****L T P C****3 0 0 3****Course Objectives:**

1. To introduce students to the fundamentals of game design, programming, and development tools.
2. To equip students with practical skills in creating, animating, and programming interactive games using modern game engines and technologies.

Course Outcomes:

At the end of course student will be able to-

1. Understand and apply core concepts of game design, storytelling, and gameplay mechanics.
2. Develop 2D and 3D game assets, including character models and animations.
3. Implement game logic and interactivity using programming languages like C# or C++.
4. Utilize game engines (Unity/Unreal) to create functional game prototypes.
5. Integrate artificial intelligence and physics into games to enhance realism and challenge.
6. Plan, develop, and present a complete game project, demonstrating teamwork and project management skills.

UNIT-I: Fundamentals of Game Design and Development

Introduction to game development and industry overview, Basics of game design: game mechanics, storytelling, level design, Game genres and target audiences, Tools and software overview (Unity, Unreal Engine, etc.), Introduction to programming concepts (C#, C++, scripting basics)

UNIT-II: Game Art and Animation

2D and 3D game art creation (concept art, modeling, texturing), Animation principles for games (character animation, motion), Environment and asset design, UI/UX design for games, Use of digital sculpting and modeling tools (Blender, Maya, Photoshop)

UNIT-III : Game Programming and Development

Game engine usage (Unity/Unreal Engine workflow), Programming game mechanics, physics, and interactions, Artificial Intelligence in games (NPC behavior, path finding), Multiplayer and networking basics, Mobile and web game development fundamentals

UNIT-IV : Advanced Game Design and Technical Skills

Level design and world-building, Game optimization and performance tuning, Augmented Reality (AR) and Virtual Reality (VR) basics, Game testing, debugging, and quality assurance, Game monetization and marketing strategies

UNIT-V : Industry Exposure and Project Work

Team collaboration and project management in game development, Internship or industry live project, Capstone project: develop a complete game prototype, Portfolio preparation and career development, Entrepreneurship in gaming and startup basics

TEXT BOOKS:

- **“Game Programming Patterns”** by Robert Nystrom, *Covers design patterns specifically for game programming.*
- **“Introduction to Game Design, Prototyping, and Development”** by Jeremy Gibson Bond, *Comprehensive introduction to game design concepts and practical development.*

REFERENCE BOOKS:

- **"Artificial Intelligence for Games"** by Ian Millington and John Funge, *In-depth exploration of AI techniques in game development.*
- **"The Art of Game Design: A Book of Lenses"** by Jesse Schell, *Focuses on the design and creative aspects of games.*