BACHELOR OF TECHNOLOGY
Computer Science and Engineering

COURSE STRUCTURE &SYLLABUS

(Batches admitted from the Academic Year 2024 -2025)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India)

Accredited by NBA & NAAC with 'A+' Grade, UGC, Govt. of India

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

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

COURSESTRUCTURE (R24)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India)

Accredited by NBA & NAAC with 'A' Grade

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

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

COURSE STRUCTURE

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

S. No	Course Code	Subject	L	T	P	C	Max. Marks		Page No
							INT	EXT	
1	2400BS01	Linear Algebra and Differential Equations	3	1	0	4	40	60	12
2	2405ES01	Programming for Problem Solving	3	0	0	3	40	60	14
3	2402ES01	Basic Electrical& Electronics Engineering	3	0	0	3	40	60	16
4	2400BS05	Applied Physics	3	1	0	4	40	60	18
5	2405ES61	Programming for Problem Solving Lab	0	0	5	2.5	40	60	20
6	2402ES61	Basic Electrical and Electronics Engineering Lab	0	0	2	1	40	60	24
7	2400BS61	Applied Physics Lab	0	0	2	1	40	60	25
8	2403ES61	Engineering Workshop	0	0	3	1.5	40	60	26
9	2400MC01	Environmental Science	2	0	0	0	100	0	28
10		Induction Programme	-	-	-	-	-	-	-
		TOTAL	**14**	**2**	**12**	**20**	**420**	**480**	

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

S.No	Course Code	Subject	L	T	P	C	Max. Marks		Page No
							INT	EXT	
1	2400BS02	Numerical Techniques & Vector Calculus	3	1	0	4	40	60	30
2	2405ES02	Data Structures	3	0	0	3	40	60	32
3	2400BS06	Engineering Chemistry	3	0	0	3	40	60	34
4	2400HS01	English for Skill Enhancement	2	0	0	2	40	60	36
5	2403ES01	Computer Aided Engineering Graphics	1	0	4	3	40	60	38
6	2400BS62	Engineering Chemistry Lab	0	0	2	1	40	60	40
7	2405ES62	Data Structures Lab	0	0	5	2.5	40	60	42
8	2400HS61	English Language and Communications Skills Lab	0	0	3	1.5	100	0	44
9	2400MC02	French /German Language	2	0	0	0	**100**	**0**	**47**
		TOTAL	**14**	**1**	**14**	**20**	**480**	**420**	

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		Page No
							INT	EXT	
1	2400BS04	Probability &Statistics	3	1	0	4	40	60	49
2	2400HS03	Business Economics and Financial Analysis	3	0	0	3	40	60	51
3	2405PC08	Database Management Systems	3	1	0	4	40	60	53
4	2405PC04	Object Oriented Programming through Java	3	0	0	3	40	60	55
5	2405PC05	Computer Organization & Architecture	3	0	0	3	40	60	57
6	2405PC64	Database Management Systems Lab	0	0	3	1.5	40	60	59
7	2405PC63	Object Oriented Programming through Java Lab	0	0	3	1.5	40	60	65
8	2400MC03	Human values and Professional Ethics	2	0	0	0	100	0	67
		TOTAL	**17**	**1**	**8**	**20**	**420**	**480**	

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

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

S. No	Course Code	Subject	L	T	P	C	Max. Marks		Page No
							INT	EXT	
1	2405PC07	Design and Analysis of Algorithms	3	0	0	3	40	60	69
2	2405PC03	Discrete Mathematics	3	0	0	3	40	60	71
3	2405PC01	Software Engineering	3	0	0	3	40	60	73
4	2405PC06	Formal Language & Automata Theory	3	1	0	4	40	60	75
5	2405PC02	Operating Systems	3	0	0	3	40	60	77
6	2405PC61	Software Engineering Lab	0	0	3	1.5	40	60	79
7	2405PC62	Operating Systems Lab	0	0	3	1.5	40	60	80
8	2400HS05	Design Thinking	0	0	2	1	40	60	81
9	2400MC04	Indian Constitution *	2	0	0	0	100	0	83
		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 – I Semester (V Semester)

S. No	Course Code	Subject	L	T	P	C	Max. Marks		Page No
							INT	EXT	
1	2405PC09	Compiler Design	3	0	0	3	40	60	
2	2405PC10	Computer Networks	3	0	0	3	40	60	
3		**Professional Elective-I**	3	0	0	3	40	60	
	2467PE02	Distributed Systems							
	2462PE16	Cyber security Essentials							
	2405PE01	Object Oriented Analysis and Design							
	2466PE12	Artificial Intelligence& its Applications							
	2405PE02	Computer Graphics & Multimedia							
	2412PE01	Mobile Computing							
4		**Professional Elective – II**	3	0	0	3	40	60	
	2412PE04	Distributed Database							
	2462PE07	Security Incident and Response Management							
	2405PE03	Software Testing Methodologies							
	2466PE13	Deep Learning Techniques							
	2466PE07	Computer Vision							
	2412PE03	Information Retrieval Systems							
5		**Open Elective-I**	3	0	0	3	40	60	
6	2405PC65	Compiler Design Lab	0	0	3	1.5	40	60	
7	2405PC66	Computer Networks Lab	0	0	3	1.5	40	60	
8	2405PR02	Field Project/ Real Time Project	0	0	2	1	40	60	
9	2405PR01	Innovative Product Development-1	0	0	2	1	40	60	
10	2400MC05	Technical Communications and Soft Skills*	2	0	0	0	100	0	
		TOTAL	**20**	**1**	**8**	**20**	**460**	**540**	

**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		Page No
							INT	EXT	
1	2400HS02	Professional English	3	0	0	3	40	60	
2	2466PC02	Machine Learning	3	0	0	3	40	60	
3	2412PC03	Full Stack Development	3	1	0	4	40	60	
4		**Professional Elective – III**	3	0	0	3	40	60	
	2467PE17	Distributed computing							
	2462PE13	Cyber laws and IT security							
	2405PE05	Software Architecture and Design Patterns							
	2466PE03	Cognitive Computing							
	2405PE11	Image Processing							
	2405PE06	Cloud Computing							
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	2405PR02	Innovative Product Development-2	0	0	2	1	40	60	
9	2400MC06	Indian Tradition Knowledge*	2	0	0	0	100	0	
		TOTAL	**20**	**1**	**8**	**20**	**460**	**540**	

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

S.No	Course Code	Subject	L	T	P	C	Max. Marks		Page No
							INT	EXT	
1	2405PC11	Information Security	3	0	0	3	40	60	
2	2405PC12	Devops	3	0	0	3	40	60	
3	2400HS04	Fundamentals of Management and Entrepreneurship	2	0	0	2			
4		**Professional Elective – IV**	3	0	0	3	40	60	
	2467PE06	Text Analytics							
	2462PE23	Data Privacy & Security							
	2405PE04	Agile Development							
	2466PE05	Large Language Models							
	2405PE07	Block Chain Technology							
	2412PE06	Internet of Things							
5		**Open Electives – III**	3	0	0	3	40	60	
6	2405PC67	Information Security Lab	0	0	2	1	40	60	
7	2405PC68	Devops lab	0	0	2	1	40	60	
8	2405PR05	Industry Oriented Mini Project / Internship / Skill Development**	0	0	2	1	40	60	
9	2405PR03	Innovative Product Development-3	0	0	2	1	40	60	
10	2405PR06	Research Project- 1	0	0	4	2	40	60	
11	2200MC08	Research methodology & Intellectual Property Rights	2	0	0	0	100	0	
		TOTAL	**16**	**0**	**12**	**20**	**500**	**600**	

**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		Page No
							INT	EXT	
1		**Professional Elective – V**	3	0	0	3	40	60	
	2467PE08	Social Network Analytics							
	2462PE19	Database Security							
	2405PE08	Software Process and Project Management							
	2466PE14	Introduction to Natural Language Processing							
	2466PE09	Game Theory							
	2412PE05	Human Computer Interaction							
2		**Professional Elective – VI**	3	0	0	3	40	60	
	2467PE09	Web and social media analytics							
	2462PE17	Digital Forensics							
	2405PE09	Software Quality Assurance & Testing							
	2466PE06	Generative AI							
	2466PE10	Augmented Reality and Virtual Reality							
	2405PE10	Secure Software Engineering							
3		**Open Electives-IV**	3	0	0	3	40	60	
4	2405PR07	Technical Seminar	0	0	2	1	100	0	
5	2405PR08	Innovation Startup & Entrepreneurship	0	0	4	2	50	100	
6	2405PR09	Research Project-2	0	0	16	8	50	100	
7	2200MC07	Gender Sensitization*	2	0	0	0	100	0	
		TOTAL	**11**	**0**	**22**	**20**	**200**	**200**	

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

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India)

Accredited by NBA & NAAC with 'A+' Grade, UGC, Govt. of India

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

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

PROFESSIONAL ELECTIVES

Professional Elective-I	Professional Elective-II	Professional Elective-III	Professional Elective-IV	Professional Elective-V	Professional Elective-VI
2467PE02 Distributed Systems	2412PE04 Distributed Database	2467PE17 Distributed computing	2467PE06 Text Anaytics	2467PE08 Social network analytics	2467PE09 Web and social media analytics
2462PE016 Cyber security Essentials	2462PE07 Security Incident and Response Management	2462PE13 Cyber laws and IT security	2462PE23 Data Privacy & Security	2462PE19 Database Security	2462PE17 Digital Forensics
2405PE01 Object Oriented Analysis and Design	2405PE03 Software Testing Methodologies	2405PE05 Software Architecture and Design Patterns	2405PE04 Agile software Development	2405PE08 Software Process and Project Management	2405PE09 Software Quality Assurance & Testing
2466PE12 Artificial Intelligence& its Applications	2466PE13 Deep Learning Techniques	2466PE03 Cognitive Computing	2466PE05 Large Language Models	2466PE14 Introduction to Natural Language Processing	2466PE06 Generative AI
2405PE02 Computer Graphics & Multimedia	2466PE07 Computer Vision	2405PE11 Image Processing	2405PE07 Block Chain Technology	2466PE09 Game Theory	2466PE10 Augmented Reality and Virtual Reality
2412PE01 Mobile Computing	2412PE03 Information Retrieval Systems	2405PE06 Cloud Computing & Ita Applications	2412PE06 Internet of Things	2412PE05 Human Computer Interaction	2405PE10 Secure Software Engineering

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

OPEN ELECTIVES

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)	1. Data Structures (2405OE03) 2.Computer Organization &Operating Systems (2405OE04)	1. Java Programming (2405OE05) 2. Case Tools & Software Testing (2405OE06)	1. Data and Knowledge Mining(2405OE07) 2. Full Stack Web Application Development (2405OE08)
IT	1. Advanced Computer Architecture (2412OE01) 2. Advanced Operating Systems (2412OE02)	1. Embedded Systems (2412OE03) 2. Scripting Languages (2412OE04)	1. Advanced Computer Networks (2412OE05) 2. Advanced Algorithms (2412OE06)	1.Computational Complexity (2412OE07) 2.Robotic Process Automation(2412OE08)
AIML	1. Knowledge representation and Reasoning (2466OE01) 2. Neural Networks (2466OE02)	1. Advanced Artificial Intelligence (2466OE03) 2. Reinforcement Learning (2466OE04)	1. Deep Learning Using Python (2466OE05) 2. Edge Analytics (2466OE06)	1. Cognitive computing & Applications (2466OE07) 2. Quantum Computing (2466OE08)
DS	1. Computer Oriented Statistical Methods (2467OE01) 2.Data Visualization Techniques (2467OE02)	1. Data Wrangling using Python (2467OE03) 2.Data Science Tools (2467OE04)	1.Big Data Architecture(2467OE06) 2. Data Science Applications (2467OE05)	1. Business Analytics (2467OE07) 2. Soft computing(2467OE08)
CS	1.Ethical hacking(2462OE01) 2. Cyber security essentials(2462OE02)	1. Cloud SecurityEssentials (2462OE03) 2. Vulnerability assessment and penetration testing (2462OE04)	1. Social media security (2462OE05) 2. Authorization and Authentication (2462OE06)	1. Cyber Securityand laws(2462OE08) 2. Security incident and response management (2462OE07)
ECE	1. Principles of Electronic Communication (2404OE01) 2.Computer Organization (2404OE05)	1.Principles of Computer Communication and Network (2404OE02) 2. Computer Architecture (2404OE06)	1. Cellular Mobile Communication (2404OE03) 2. Pattern Recognition (2404OE07)	1.5G Technology (2404OE04) 2. RTOS and System Programming (2404OE08)

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution-UGC, Govt. of India)

Accredited by NBA & NAAC with 'A' Grade, UGC, Govt. of India

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

Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

VISION OF THE INSTITUTE

- 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.

MISSION OF THE INSTITUTE

- 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 trainingprograms.
- To create pleasant academic environment for generating high level learning attitudes.

VISION OF THE DEPARTMENT

- To emerge as a center of excellence in the department of IT is to empower students with new wave technologies to produce technically proficient and accomplished intellectual IT professionals specifically to meet the modern challenges of the contemporary computing industry and society.
- Providing the students with most conducive academic environment and making them towards serving the society with advanced technologies

MISSION OF THE DEPARTMENT

- M1: The mission of the department of Information Technology is to afford excellence education for students, in the conventional and modern areas of information technology and build up students with high-quality principled trainings, thus manifesting their global personality development.
- M2: To impart holistic technical education using the best of infrastructure, outstanding technical and teaching expertise
- M3: Training the students into competent and confident world class professionals with excellent technical and communication skills.
- M4: To provide quality education through innovative teaching and learning process that yields advancements in state-of-the-art information technology.
- M5: To inculcate the spirit of ethical values contributing to the welfare of the society by offering courses in the curriculum design.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Apply current industry computing practices and emerging technologies to analyze, design, implement, test, and verify IT based solutions to real world problems.

PEO 2: To promote employable graduates to be placed in various engineering positions in the computational world in firms of international reputation.

PEO 3: To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PEO 4: Theoretical and practical concepts of various domains to realize new ideas and innovations for pursuing research, entrepreneurship, employment, and higher studies.

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 andresearch methods including design of experiments, analysis and interpretation of data andsynthesis 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 teamwork-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 forand 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: An ability to analyze a problem, design algorithm, identify and define the computing requirements within realistic constraints in multidisciplinary areas by understanding the core principles and concepts of Information Technology.

PSO 2: Knowledge of data management system like data acquisition, big data to enable students in solving problems using the techniques of data analytics like pattern recognition and knowledge discovery.

PSO 3: Effectively integrate IT based solutions into the user environment.

I - B. TECH SYLLABUS (CSE)

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

B.Tech I Year I Semester

L	T	P	C
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.
- Methods of solving the linear differential equations of first order, equations solvable for p, y and x.
- Methods of solving the linear differential equations of higher order.
- Partial differentiation, concept of total derivative, finding maxima and minima of function of two and three variables.

Course Outcomes:

After learning the contents of this paper, the student must be able to

- Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.
- Find the Eigen values and Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations.
- Identify whether the given differential equation of first order is exact or not and solve the first order differential equations.
- Solve higher differential equation and apply the concept of differential equation to real world problems.
- Find the extreme values of functions of two variables with/ without constraints.

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 powers 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:

First Order ODE: Exact, Linear and Bernoulli's equations; Newton's law of cooling, Law of Natural Growth and Decay; Equations not of first degree: Equations solvable for p, y and x, Clairaut's type.

UNIT-IV:

Ordinary Differential Equations of Higher Order: Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{x}, ***sin ax, cos ax***, polynomials in x, $e^{ax}V(x)$ and $x\,V(x)$, Method of Variation of Parameters.

UNIT-V:

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's multipliers.

TEXTBOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics,NarosaPubishers, 4th Edition, 2014.

REFERENCES:

1. Michael Greenberg, Advanced Engineering Mathematics, Pearson Education, 2nd Edition, 1998.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons,
3. 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 P C**
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: The student will learn

- 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 Arrays.

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 Pointer 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. Louden and K A Lambert., 3rd edition, Cengage Learning.

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

B.Tech. I Year I Sem **L T P C**
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:
- To analyze and solve electrical circuits using network laws and theorems.
- To understand and analyze basic Electric and Magnetic circuits
- To study the working principles of Electrical Machines
- To introduce components of Low Voltage Electrical Installations

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", McGrawHill,2009.
3. L.S. Bobrow, Fundamentals of Electrical Engineering", Oxford UniversityPress,2011
4. Electrical and Electronics Technology, E. Hughes, 10th Edition,Pearson,2010.
5. Electrical Engineering Fundamentals, Vincent Deltoro, Second Edition, PrenticeHall India,1989.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400BS05) APPLIED PHYSICS

B.Tech. I Year I Sem **L T 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: Upon graduation:

- The student would be able to learn the fundamental concepts on Quantum behavior of
- matter in its microstate.
- The knowledge of fundamentals of Semiconductor physics, electronic devices, Lasers and fiber optics enable the students to apply to various systems like communications, solar cell, photocells and so on.
- Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
- The course also helps the students to have exposure on dielectric materials and magnetic 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.

TEXTBOOKS:

1. Engineering Physics, B.K. Pandey, S. Chaturvedi - Cengage Learing.
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 DeepakGuptha on NPTEL
4. “Semiconductor Physics And Devices”, Mc Graw 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
(2405ES61) PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech. I Year I Sem **L T P C**
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
x 1 = 5
5 x 2=10
5 x 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+……...+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 "HelloPython"
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 string backwards
(g) The seventh character of the string if the string is long enough and a message otherwise
(h) The string with its first and last characters removed
(i) The string in all caps
(j) The string with every a replaced with an e
(k) 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

i.

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

B.Tech. I Year I Sem **L T P C**
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:
- Get an exposure to basic electrical laws.
- Understand the response of different types of electrical circuits to different excitations.
- Understand the measurement, calculation and relation between the basic electrical parameters.
- Understand the basic characteristics of transformers and electrical machines.

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

(2400BS61) APPLIED PHYSICS LAB

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

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 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.

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN

(2403ES61) ENGINEERING WORKSHOP

B. Tech I Year I Semester **L T P C**
0 0 3 1.5

Course Objectives:

- To Study of different hand operated power tools, uses and theirdemonstration.
- To gain a good basic working knowledge required to produce variousengineering products.
- To provide hands on experience about use of different engineering materials,tools, equipment's and processes those are common in the engineeringfield.
- To develop a right attitude, team working, precision and safety at workplace.
- To study commonly used carpentryjoints and to have practical exposure to various welding and joiningprocesses.

Course Outcomes:

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

- Study and practice on machine tools and theiroperations
- Practice on manufacturing of components using workshop trades including pluming,fitting, carpentry, foundry, house wiring andwelding.
- Identify and apply suitable tools for different trades of engineering processesIncluding drilling, material removing, measuring, chiseling.
- Apply basic electrical engineering knowledge for house wiringpractice.
- Study commonly used carpentry joints.

I.Carpentry

1.Cross lap joint
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 (staircase 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 (Water Plasma)

TEXTBOOKS:

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

(2400MC01) ENVIRONMENTAL SCIENCE

B.Tech. I Year I Sem **L T P 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:

- Based on this course, the Engineering graduate will understand /evaluate / develop technologies based on ecological principles and environmental regulations which in turn helps in sustainable development.

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- Go initiatives.

UNIT-V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wildlife 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 FootPrint, Life Cycle assessment (LCA), Low carbon lifestyle.

TEXTBOOKS:

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:

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHILearning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Textbook of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS. Publications

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN
(2400BS02) NUMERICAL TECHNIQUES & VECTOR CALCULUS

B. Tech I Year II Semester

L	T	P	C
3	1	0	4

Course Objectives: To learn:

- Geometrical approach to the mean value theorems, their application to the mathematicalproblems 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 functionsand their applications to line, surface and volume integrals.
- A periodic function by Fourier series and a non-periodic function by Fourier transformand properties.
- Properties of Laplace transforms, solving ordinary differential equations using Laplacetransforms techniques. Also, Z- transform of a sequence and properties.

Course Outcomes:

After learning the contents of this paper 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.

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, 36thEdition, 2010.
2. R. K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Pubishers, 4th Edition, 2014.

REFERENCES:

1. ErwinKreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2.Staff, E. B. and A. D. Snider , Fundamentals of Complex Analysis , Pearson.
3. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405ES02) DATA STRUCTURES AND ALGORITHMS

B.Tech. I Year II SEM **L TPC**
3 0 0 3

Objectives:

- To impart the basic concepts of data structures and algorithms.
- To understand concepts about searching and sorting techniques
- To understand basic concepts about stacks, queues, lists trees and graphs.
- To enable them to write algorithms for solving problems with the help of fundamental data Structures.

Outcomes:

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

- For a given Algorithm student will 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 able to implement it. For a given problem of Stacks, Queues and linked list student will able to implement it and analyze the same to determine the time and computation complexity.
- Student will 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. Student will able to implement Graph search and traversal algorithms and determine the time and computation complexity.

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.

UNIT-IV

Doubly Linked List: operations on it and algorithmic analysis. **Circular Linked List:** all operations on it. Applications of Linked List.

UNIT-V

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-VI

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.

REFERENCE BOOKS:

1. Hands-On Data Structures and Algorithms with Python: Write complex and powerfulcodeusing the latest features of Python 3.7, 2nd Edition by Dr. Basant Agarwal, Benjamin Baka.
2. Data Structures and Algorithms with Python by Kent D. Lee and Steve Hubbard.
3. Problem Solving with Algorithms and Data Structures Using Python by Bradley N Miller and David L. Ranum.
4. Core Python Programming -Second Edition,R. Nageswara Rao, DreamtechPress

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN

(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:

- The knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
- To know the modern technology and interpret different problems involved in industrial utilization of water.
- The required principles and concepts of electrochemistry, corrosion to predict the behavior of a system under different variables.
- The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
- The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.

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 N_2, O_2 and F_2 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 complexo metric 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: H_2-O_2 Fuel cell, CH_3OH-O_2 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: Galavanising,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≡ N, C=C, C≡ C), Applications of IR Spectroscopy, ^{1}H-NMR(NMR Spectroscopy), Principles of NMR spectroscopy, chemical shift, Chemical shifts of some organic protons , Introduction to Magnetic resonance imaging.

Suggested Textbooks:

1. Physical Chemistry, by P.W. Atkins
2. Engineering Chemistry by P.C.Jain & M.Jain; Dhanpat Rai 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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2400HS01) ENGLISH FOR SKILL ENHANCEMENT

B.Tech. I Year II Sem **LTPC**
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.

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.

Prescribed Textbook:

1. Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. Cambridge University Press.

References:

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford UniversityPress.
3. Wood, F.T. (2007).Remedial English Grammar.Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper ResourceBook.
5. Hamp-Lyons, L. (2006).Study Writing. Cambridge UniversityPress.
6. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford University Press

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN

(2403ES01) COMPUTER AIDED ENGINEERING GRAPHICS

B.Tech I Year II Semester

L	T	P	C
1	0	4	3

Course Objectives:

- To enable the students with various concepts like Dimensioning, Conventions and standards related to working drawing to become professionally efficient and to introduce fundamental concepts of curves used in engineering,
- 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.
- Understands and becomes efficient in applying the concept of Orthographic Projections of Points, Lines and Planes in industrial applications.
- Can employ freehand 3D pictorial sketching to aid in the visualization process and to efficiently communicate ideas graphically.
- Analyze a drawing and can efficiently communicate ideas graphically and Draw the 3D views using CAD.

Course Outcomes:

- Gets knowledge on usage of various drawing instruments and capable to draw various curves like conic curves, cycloidal curves and involutes.
- 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.
- Understand about orthographic projection and able to draw planes and solids according to orthographic projections.
- Can employ freehand 3D pictorial sketching to aid in the visualization process and to draw the 3D views using CAD software.
- To convert and draw the given orthographic view to isometric view using CAD software and vice versa.

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.

TEXTBOOKS

1. Engineering Drawing, N.D. Bhatt – N.D. Bhatt & V.M Panchal, 48th Edition, 2005Charotar 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.Engineering Drawing by K.Venu Gopal& 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.

MALLAREDDYENGINEERINGCOLLEGEFORWOMEN

(2400BS62) ENGINEERING CHEMISTRY LAB

B. Tech I Year I 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 thinlayer chromatographic (TLC) technique.

Course Outcomes:

- 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 report and predict the significance of properties like adsorption, conductance, viscosity, pH and surface tension.
- To demonstrate the technique of thin Layer Chromatography (TLC) and synthesize 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. eg 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 (Vikas publishing, 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
(2405ES62) DATA STRUCTURES LAB

B.Tech. I Year II Sem **L T P C**
0 0 5 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, QuickSort, Merge Sort, Heap Sort and compare their performance in term of Space and Time 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)Mergesort b) Heapsort

Week 12:

Write a C & Python program to implement the following sorting techniques.
i)Bubblesort ii) Selectionsort
iii) Quicksort iv) Insertionsort

Week 13:

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

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2400HS61) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

B.Tech. I Year II Sem

L	T	P	C
0	0	3	1.5

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

Syllabus

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

a.Computer Assisted Language Learning (CALL)Lab

b.Interactive Communication Skills (ICS)Lab

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.

****

Minimum Requirement of infrastructural facilities for ELCS Lab:

1.Computer Assisted Language Learning (CALL)Lab:

The Computer Assisted Language Learning Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

System Requirement (Hardware component):

Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

i) Computers with Suitable Configuration

ii)High Fidelity Headphones

2.Interactive Communication Skills (ICS) Lab:

The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public-Address System, LCD and a projector etc.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2400MC02) FRENCH/ GERMAN LANGUAGE

B.Tech. I Year II Sem **LT PC**
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

- The students will be able to communicate in French atA1level.
- The student will have an advantage in the competitive jobmarket.
- This course benefits the graduates when pursuing study *opportunities* in the countries whereFrench is the official language.

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 theweather / ask the weather - ask the opinion - give your opinion - express your agreement disagreement

Writing: Descriptions

Grammar: Demonstrative adjectives -Prepositions - The verb 'must' to indicate obligation andnecessity 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. Ã L'Aventure: An Introduction to French Language and Francophone Cultures by Evelyne Charvier - Berman, Anne C. Cummings.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2400BS04) PROBABILITY AND STATISTICS

B.Tech. II Year I Sem **LTPC**
3 1 0 4

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 paper the student must be able to

- Distinguish between random variables pertaining to discrete/ continuous distribution systems and apply the discrete distributions like Binomial and Poisson and continuous distribution like Normal and their properties.
- The student would be able to calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations.
- Examine statistical hypothesis for large samples.
- Examine statistical hypothesis for small samples.
- Establish relationship between functionally related data and up to what extent they are correlated using correlation coefficient and coefficient of regression of the given data.

UNIT – I

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

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

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 (casesof 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

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

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.

TEXTBOOKS:

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

(2400HS03) BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

B.Tech. II Year I Sem **L T P C**

3 0 0 3

Objectives:

- To enable the student to understand and appreciate, with a particular insight, the importance of certain basic issues governing the business operations namely, demand and supply, production function, cost analysis, markets, forms of business organizations, capital budgeting and financial accounting and financial analysis.

Outcomes:

At the end of the course, the student will

- Understand the market dynamics namely, demand and supply, demand forecasting, elasticity of demand and supply, pricing methods and pricing in different market structures.
- Gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis.
- Develop an understanding to analyze how capital budgeting decisions are carried out.
- Understanding the framework for both manual and computerized accounting process.
- Know how to analyze and interpret the financial statements through ratio analysis.

UNIT I:

Introduction& Demand Analysis: Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

UNIT II:

Production & Cost Analysis: Production Function - MRTS, Least Cost Combination of Inputs, Laws of Returns to Scale, Internal and External Economies of Scale. Cost Analysis: Cost concepts. Break-even Analysis (BEA) - Determination of Break-Even Point (simple problems).

UNIT III:

Markets & New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition, Pricing: Objectives and Policies of Pricing, Methods of Pricing,

Business: Features and evaluation of different forms of Business Organization, Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment, Changing Business Environment in Post-liberalization scenario.

UNIT IV:

Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital, Capital Budget, Cash Budget, Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting, Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

UNIT V:

Introduction to Financial Accounting & Financial Analysis: Accounting concepts and Conventions - Double Entry - Book Keeping, Journal, Ledger, Trial Balance - Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments), Financial Statement Analysis: cash flow & Funds flow statements (simple problems).

TEXTBOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers, Hyderabad 2013.
3. M. Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi, 2012.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2012.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson, 2012.
3. Lipsey & Chrystel, Economics, Oxford University Press, 2012.
4. Domnick Salvatore: Managerial Economics In a Global Economy, Thomson, 2012.
5. Narayanaswamy: Financial Accounting - A Managerial Perspective, Pearson, 2012.
6. S.N. Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2012.
7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2012.
8. Dwivedi: Managerial Economics, Vikas, 2012.
9. Shailaja & Usha: MEFA, University Press, 2012.
10. Aryasri: Managerial Economics and Financial Analysis, TMH, 2012.
11. Vijay Kumar & Appa Rao, Managerial Economics & Financial Analysis, Cengage 2011.
12. J.V. Prabhakar Rao & P.V. Rao, Managerial Economics & Financial Analysis, Maruthi Publishers, 2011.

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:

- Demonstrate the basic elements of a relational database management system and Ability to identify the data models for relevant problems.
- Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.
- Apply normalization for the development of application software.

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.

UNIT V:

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 Backupsystems.

UNIT – VI: 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.

TEXTBOOKS:

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGrawHill 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, McGrawHill Education(India) Private Limited l, 6th edition.(Part of UNIT-I,UNIT-IV)

REFERENCE BOOKS:

1. Database Systems, 6th edition, R Elmasri, Shamkant B.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. Database Development and Management, Lee Chao, Auerbach publications, Taylor& Francis Group.
5. Introduction to Database Systems, C.J.Date, Pearson Education

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

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

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 can:

- An understanding of the principles and practice of object-oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements.
- A competence to design, write, compile, test and execute straightforward programs using a high-level language.
- An appreciation of the principles of object-oriented programming.
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.
- Be able to make use of members of classes found in the Java API.
- Demonstrate the ability to employ various types of selection constructs in a java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Able to develop applications using Applet and Swings.

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 andLifetimeofvariables,Operators,Typeconversionandcasting,Enumeration,Controlflow-blockscope, 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.

UNIT-III

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

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.

UNIT-IV

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

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.

UNIT-V

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

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

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

UNIT-VI

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, GridLayoutandGridbagLayout.

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
3. Object Oriented Programming through Java,P.RadhaKrishna, Universities Press.
4. Thinking in Java, Bruce Eckel, PE
5. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.
6. Design Patterns Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides

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

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

Course Objectives

- The purpose of the course is to introduce principles of computer organization and the basic architectural concepts.
- It begins with basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
- Topics include computer arithmetic, instruction set design, microprogrammed control unit, pipelining and vector processing, memory organization and I/O systems, and multiprocessors

Course Outcomes

- Understand the basics of instruction sets and their impact on processor design.
- Demonstrate an understanding of the design of the functional units of a digital computer system.
- Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
- Design a pipeline for consistent execution of instructions with minimum hazards.
- Recognize and manipulate representations of numbers stored in digital computers

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. Morris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, V th Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
3. Structured Computer Organization – Andrew S. Tanenbaum, 4 th Edition, PHI/Pearson.

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

B.Tech. II Year I Sem **L T P C**
0 0 3 1.5

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 purse 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

- In drawing the ER, EER, and UML Diagrams.
- In analyzing the business requirements and producing a viable model for the implementation of the database.
- In converting the entity-relationship diagrams into relational tables.
- To develop appropriate Databases to a given problem that integrates ethical, social, legal, and economic concerns.

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

A.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 must design and develop a Database which consists of 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:

1. BUS
2. Ticket
3. Passenger

Relationships:

1. Reservation
2. Cancellation

Primary Key Attributes:

1. Ticket ID (TicketEntity)
2. Passport ID(PassengerEntity)
3. 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,

AgeInteger 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, 24,'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.Tickent N0 > 60 THEN SET
New.Tickent 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
into v_id, v_name; Close cl; END Tables BUS
Bus No: Varchar:
PK (Primary key) Source: Varchar Destination:
Varchar DeptTime: VarcharPassenger
PPNO: Varchar(15)) :
PK Name:
Varchar (15) Age: int (4) Sex: Char(I 0) : Male/Female Address: VarChar(20)

Passenger Tickets

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

Reservation

PNR_No: Numeric (9) :
PK Journey date :date time(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: date time(8) Age : int (4)
Sex:Char(10) :Male/Female
Source :Varchar Destination :Varchar Dep_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 instanceonly.

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	PassportID

Passport_id	Ticket_id

You can do these cond and third normal forms if required. And how Normalizedtables 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 todisplay his/her name & tax, by creating table under employee database as below. Employee_salaryEmp_no Basic HRA DA Total_deduction

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 operationsConsider 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. Developaquerytograntallprivilegesofemployeestableintodepartmentstable
2. Developaquerytograntsomeprivilegesofemployeestableintodepartmentstable
3. Developaquerytorevokeallprivilegesofemployeestablefromdepartmentstable
4. Develop a query to revoke some privileges of employees table from departmentstable
5. Write a query to implement the savepoint
6. Write a query to implement thecommit
7. Write a query to implementrollback

REFERENCE BOOKS:

1. Introduction to SQL, RickF. Vander Lans, Pearsoneducation..
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova, Pearsoneducation.
3. Oracle PL/SQL Programming, StevenFeuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g,B lack Book, Dr.P.S.Deshpande, DreamTech
5. Oracle Database 11g PL/ SQL Programming,M.McLaughlin,TMH
SQL Fundamentals, J.J.Patrick, PearsonEducation

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

B.Tech. II Year I Sem **L T P C**
0 0 3 1.5

Course Objectives:

- To prepare students to become familiar with the Standard Java technologies ofJ2SE
- To prepare students to excel in Object Oriented programming and to succeed as a JavaDeveloper through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and to learn Advanced Java topics like J2ME, J2EE, JSP and JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze,designand 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:

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts inOOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret objectoriented data and report results.
- Demonstrate an ability to design an object-oriented system, Swing components or multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like console and windows applications both for standalone and Applets program.

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 Scannerclass.
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 itssub 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:
Write a java program for handling Mouse events and Key events.

Week 11:
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.

TEXTBOOK/ REFERENCE BOOKS:

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
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
(2400MC03) HUMAN VALUES AND PROFESSIONAL ETHICS

B.Tech. II Year I Sem **L T P C**
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 Outcome:

- The students will understand the importance of Values and Ethics in their personal lives and professional careers. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

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: Workplace Rights & Responsibilities, Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession; Responsibilities,ObligationsandMoralValuesinProfessionalEthics,Professionalcodesofethics, 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.

TEXTBOOKS:

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,3rdEdition.
2. Ivan IIIich, 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
(2405PC07) DESIGN AND ANALYSIS OF ALGORITHMS

B.Tech. II Year 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:

- Be able to analyze algorithms and improve the efficiency of algorithms.
- Apply different designing methods for development of algorithms to realistic problems,such as divide and conquer, greedy and etc.
- Ability to understand and estimate the performance of algorithm.

UNIT – I

Introduction-Algorithm definition, Algorithm Specification, Performance Analysis-Spacecomplexity, 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 salesperson problem.

UNIT - IV

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

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

UNIT V:

NP- Hard and NP-Complete problems- Basic concepts, non-deterministic algorithms, NP - Hard and NP- Complete classes, Cook's theorem.

TEXTBOOKS:

2. Fundamentals of Computer Algorithms, 2nd Edition, Ellis Horowitz, SartajSahniand S.Raja sekharan, Universities Press.
3. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, 2ndedition, PearsonEducation.

REFERENCE BOOKS:

1. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich andR. Tomassia, John Wiley andsons.
4. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press
5. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
6. Foundations of Algorithms,, R. Neapolitan and K. Naimipour, 4thedition, Jones andBartlett Student edition.
7. Introduction to Algorithms, 3rdEdition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, andC. Stein, PHI

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(2405PC03) DISCRETE MATHEMATICS

B.Tech. II Year II Sem **L T P C**
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 can:
- For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives.
- For a given a problem, derive the solution using deductive logic and prove the solution based on logical inference.
- For a given a mathematical problem, classify its algebraic structure Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra Develop the given problem as graph networks and solve with techniques of graph theory.

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.

TEXTBOOKS:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw–Hill
2. Susanna S. Epp, Discrete Mathematics with Applications,4th edition, WadsworthPublishing 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:

1. J.P. Tremblay and R. Manohar, "Discrete Mathematical Structure and It's Applicationto Computer Science", TMG Edition, Tata McGraw-Hill
2. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press. Schaum's Outlines Series, Seymour Lipschutz, Marc Lipson,
3. Discrete Mathematics, Tata McGraw–Hill

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2405PC01) SOFTWARE ENGINEERING

B.Tech. II Year II Sem **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.
- To know about quality control and risk management.

Course Outcomes: Students will have the ability:

- To compare and select a process model for a business system.
- To identify and specify the requirements for the development of an application.
- To develop and maintain efficient, reliable and cost effective software solutions.
- To critically think and evaluate assumptions and arguments

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 elicitationand 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, 6thedition. 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

(2405PC06) FORMAL LANGUAGE AND AUTOMATA THEORY

B.Tech. II Year II Sem **L T P C**

3 1 0 4

Objectives:

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

Outcomes:

- Graduate should be able to understand the concept of abstract machines and their power to recognize the languages.
- Attains the knowledge of language classes & grammars relationship among them with the help of Chomsky hierarchy.
- Graduate will be able to understand the pre-requisites to the course compiler or advanced compiler design.

UNIT - I

Introduction to Finite Automata: Structural Representations, Central Concepts of Automata Theory and it's Applications. Deterministic Finite Automata, Nondeterministic Finite Automata, Finite Automata with Epsilon-Transitions. Moore and Mealy machine. Equivalence and minimization of FSM.

UNIT - II

Regular Expressions: Finite Automata and Regular Expressions, Applications of Regular Expressions, Algebraic Laws for Regular Expressions, Pumping Lemma for Regular Languages, Applications of the Pumping Lemma, Closure Properties of Regular Language. Equivalence of FA and Regular expression.

UNIT - III

Context-FreeGrammars: Definition,DerivationsUsingaGrammar,Leftmostand RightmostDerivations,theLanguageofaGrammar,SententialForms,ParseTrees, Minimization of Context-Free Grammar, Ambiguity in Grammars andLanguages.

UNIT - IV

Push Down Automata: Construction of Pushdown Automaton, the Languages of a PDA, Equivalence of PDA's and CFG's, Deterministic Pushdown Automata.

UNIT - V

Normal Forms for Context- Free Grammars, Closure Properties of Context-Free Languages. Types of Normal Forms and it's conversations.

Introduction to Turing Machines: Turing Machine, Programming Techniques for Turing Machines, Extensions to the basic Turing Machine, Restricted Turing Machines, Universal Turing Machine(UTM).

UNIT - VI

Undecidability: A Language that is Not Recursively Enumerable, An Undecidable Problem That is RE, Undecidable Problems about Turing Machines, Post's Correspondence Problem, Intractable Problems**:** The Classes P and NP, NP- Complete Problem. Rice's Theorem.

TEXTBOOKS:

1. Introduction to Automata Theory, Languages, and Computation, 3nd Edition, John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Pearson Education.
2. Introduction to the Theory of Computation, Michael Sipser, 3rd edition, CengageLearning.
3. Kamala Krithivasan and Rama R, Introduction to FormalLanguages, Automata Theory and Computation, Pearson Education,2009.

REFERENCE BOOKS:

1. Introduction to Languages and the Theory of Computation, John C Martin, TMH.
2. Introduction to Computer Theory, Daniel I.A. Cohen, JohnWiley.
3. A Text book on Automata Theory, P. K. Srimani, Nasir S. F. B, Cambridge University.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2405PC02) OPERATING SYSTEMS

B.Tech. II Year II Sem **LTPC**
3 0 0 3

Course Objectives:

Students will be able:

- Tolearn 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:

- Create processes and threads.
- Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time.
- For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.
- Design and implement file management system.
- Develop the I/O management functions in OS for the given I/O devices and OS.

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, Dinning 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

TEXTBOOKS:

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.

2. 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

4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2405PC61) SOFTWARE ENGINEERING LAB

B.Tech. II Year II Sem **L T P C**
0 0 3 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.

Course Outcomes:

- 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
- Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

List of Experiments

Do the following 8 exercises for any two projects given in the list of sample projects or any other projects:

1. Development of problem statement.
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
4. Stock Maintenance System
5. Online course reservation system
6. E-ticketing
7. Software Personnel Management System
8. Credit Card Processing
9. E-book management System.
10. Recruitment system

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2405PC62) OPERATING SYSTEMS LAB

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

- Ability to implement inter process communication between two processes.
- Ability to design and solve synchronization problems.
- Ability to simulate and implement operating system concepts such as scheduling,
- Deadlock management, file management, and memory management.

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 allocationTechniques
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 BOOK:

1. An Introduction to Operating Systems, P.C.P Bhatt, 2nd edition, PHI.

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(2400HS05) DESIGN THINKING

B.Tech. II Year II Sem

L T P C
0 0 2 1

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

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

- 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.

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.

Text Books

1. Change by design, Tim Brown, 2009, Harper Collins
2. Engineering design, George E Dieter,4th Revised edition, 2009 McGraw Hill.

Reference Books

1. Design Thinking for Strategic Innovation, Idris Mootee,2013, John Wiley & Sons
2. Design Thinking-The Guidebook – Facilitated by the Royal Civil service Commission, Bhutan
3. Design Methods: A Structured Approach for Driving Innovation in Your Organization, Vijay Kumar, First Edition, 2012, Wiley
4. Human-Centered Design Toolkit: An Open-Source Toolkit to Inspire New Solutions in the Developing World, IDEO, Second Edition, 2011, IDEO

e-Resources & other digital material

1. https://www.interactiondesiqn.ora/literature/topics/desiqn-thinkinq
2. https://www.interactiondesiqn.prq/literature/article/how-tq-<eve'op-anempath\capproach-in-design-thinking

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:

Students will be able to understand and discuss about Indian constitution. The students will learn their Rights and Responsibilities as an Indian citizen.

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, HULaw, 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