MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

MLRS-B.Tech –Electrical & Electronics Engineering
Course Structure (R22)

Category	Credits
Humanities and social sciences including management courses (HSMC)	10
Basic Sciences Courses (BS)	22.5
Engineering sciences courses including workshop, drawing basics of electrical/mechanical/computer etc. (ES)	18.5
Professional core courses (PC)	64
Professional Electives courses relevant to chosen specialization/branch (PE)	18
Open subjects- Electives from other technical and/or emerging subjects (OE)	9
Project work, seminar and internship in industry or elsewhere (PS)	18
Mandatory Courses	-
Total	160

I YEAR I SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2210001	Matrix Algebra and Calculus	BS	3	1	0	4	40	60	100
2	2210009	Engineering Chemistry	BS	3	1	0	4	40	60	100
3	2210501	Programming for Problem Solving	ES	3	0	0	3	40	60	100
4	2210221	Electrical Circuits Analysis-I	PC	3	0	0	3	40	60	100
5	2210371	Engineering Drawing Practice	ES	1	0	4	3	40	60	100
6	2210276	Elements of Electrical and Electronics and Engineering	PC	0	0	2	1	50	-	50
7	2210009	Engineering Chemistry Laboratory	BS	0	0	2	1	40	60	100
8	2210571	Programming for Problem Solving Laboratory	ES	0	0	2	1	40	60	100
		Induction Program	-	-	-	-	-	-	-	-
Total Credits				**13**	**2**	**10**	**20**	**330**	**420**	**750**

I YEAR II SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2220002	Differential Equations and Vector Calculus	BS	3	1	0	4	40	60	100
2	2220008	Applied Physics	BS	3	1	0	4	40	60	100
3	2220372	Engineering Workshop	ES	1	0	3	2.5	40	60	100
4	2210010	English for skill Enhancement	HSMC	2	0	0	2	40	60	100
5	2220222	Electrical Circuits Analysis-II	PC	2	0	0	2	40	60	100
6	2220572	Data Structures Laboratory	ES	0	1	2	2	40	60	100
7	2220071	Applied Physics Laboratory	BS	0	0	3	1.5	40	60	100
8	2220073	English Language and Communication Skills Laboratory	HSMC	0	0	2	1	40	60	100
9	2220277	Electrical Circuits Analysis Laboratory	PC	0	0	2	1	40	60	100
10	2220021	Environmental Science	*MC	3	0	0	0	-	-	-
Total Credits				**14**	**3**	**12**	**20**	**360**	**540**	**900**

***MC- Satisfactory/Unsatisfactory**

II YEAR I SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2230223	Power System-I	PC	3	0	0	3	40	60	100
2	2230301	Solid Mechanics & Hydraulic Machines	ES	3	1	0	4	40	60	100
3	2230402	Analog Electronics	PC	2	0	0	2	40	60	100
4	2230224	Electrical Machines-I	PC	3	0	0	3	40	60	100
5	2230225	Electro Magnetic Fields	PC	3	0	0	3	40	60	100
6	2230278	Electrical Machines Laboratory-I	PC	0	0	2	1	40	60	100
7	2230471	Analog Electronics Laboratory	PC	0	0	2	1	40	60	100
8	2230279	Electrical Simulation tools Laboratory	PC	0	0	2	1	40	60	100
9	2230586	Applied Python Programming Laboratory	ES	0	1	2	2	40	60	100
10	2230022	Gender Sensitization	MC *	2	0	0	0	-	-	-
Total Credits				**16**	**2**	**8**	**20**	**360**	**540**	**900**

II YEAR II SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2240003	Numerical Methods and Complex variables	BS	3	1	0	4	40	60	100
2	2240226	Measurements and Instrumentation	PC	3	0	0	3	40	60	100
3	2240227	Electrical Machines-II	PC	3	0	0	3	40	60	100
4	2240403	Digital Electronics and IC Applications	PC	2	0	0	2	40	60	100
5	2240228	Power System-II	PC	3	0	0	3	40	60	100
6	2240280	Electrical Machines Laboratory-II	PC	0	0	2	1	40	60	100
7	2240472	Digital Electronics and IC Applications Laboratory	PC	0	0	2	1	40	60	100
8	2240281	Measurements and Instrumentation Laboratory	PC	0	0	2	1	40	60	100
9	2240291	Field Based Project	PS	0	0	4	2	50	-	50
10	2240023	Constitution of India	*MC	2	0	0	0	-	-	-
Total Credits				**16**	**1**	**10**	**20**	**370**	**480**	**850**

***MC- Satisfactory/Unsatisfactory**

III YEAR I SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2250229	Power Electronics	PC	3	1	0	4	40	60	100
2	2250230	Control Systems	PC	3	0	0	3	40	60	100
3	2250404	Microprocessors & Microcontrollers	PC	3	0	0	3	40	60	100
4		Open Elective-I	OE	3	0	0	3	40	60	100
5	2250016	Business Economics and Financial Analysis	HSMC	3	0	0	3	40	60	100
6	2250282	Power Electronics Laboratory	PC	0	0	2	1	40	60	100
7	2250074	Advanced English Communications skills lab	HSMC	0	0	2	1	40	60	100
8	2250473	Microprocessors & Microcontrollers Laboratory	PC	0	0	2	1	40	60	100
9	22505xx	Java Programming Lab	ES	0	0	2	1	40	60	100
		Environmental Science	*MC	3	0	0	0	-	-	-
Total Credits				**18**	**1**	**8**	**20**	**360**	**540**	**900**

III YEAR II SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1		Open Elective-II	OE	3	0	0	3	40	60	100
2		Professional Elective-I	PE	3	0	0	3	40	60	100
3	2260405	Basics of Digital Signal Processing	PC	2	0	0	2	40	60	100
4	2260231	Power System Protection	PC	3	0	0	3	40	60	100
5	2260232	Power System Operation and Control	PC	3	1	0	4	40	60	100
6	2260284	Power System Laboratory	PC	0	0	2	1	40	60	100
7	2260474	Basics of Digital Signal Processing Lab	PC	0	0	2	1	40	60	100
8	2260283	Control Systems Laboratory	PC	0	0	2	1	40	60	100
9	2260293	Industry Oriented Mini Project	PS	0	0	4	2	-	100	100
10	2250024	Intellectual Property Rights	*MC	2	0	0	0	-	-	-
Total Credits				**16**	**1**	**10**	**20**	**320**	**580**	**900**

***MC- Satisfactory/Unsatisfactory**

***MC-Environmental Science- Should be registered by Lateral Entry students only**

IV YEAR I SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1	2270233	Power Electronic Applications to Renewable Energy Systems	PC	3	1	0	4	40	60	100
2		Open Elective-III	OE	3	0	0	3	40	60	100
3		Professional Elective-II	PE	3	0	0	3	40	60	100
4		Professional Elective-III	PE	3	0	0	3	40	60	100
5	2270017	Fundamentals of Management for Engineers	HSMC	3	0	0	3	40	60	100
6	2270285	Simulation of Renewable Energy Systems Laboratory	PC	0	0	2	1	40	60	100
9	2270294	Project Stage - I	PS	0	0	6	3	-	100	100
Total Credits				**15**	**1**	**8**	**20**	**240**	**460**	**700**

IV YEAR II SEMESTER

S. No.	Course Code	Course Title	Course Area	Hours Per Week			Credits	Scheme of Examination Maximum Marks		
				L	T	P		Internal (CIE)	External (SEE)	Total
1		Professional Elective-IV	PE	3	0	0	3	40	60	100
2		Professional Elective-V	PE	3	0	0	3	40	60	100
3		Professional Elective-VI	PE	3	0	0	3	40	60	100
4	2280295	Technical Seminar	PS	0	0	4	2	100	-	100
5	2280296	Project Stage - II	PS	0	0	18	9	40	60	100
Total Credits				**9**	**0**	**22**	**20**	**260**	**240**	**500**

PE I - Professional Elective I

S.No	Course Code	Course Title
1	2260234	IoT Applications in Electrical Engineering
2	2260235	High Voltage Engineering
3	2260236	Power System Analysis

PE II - Professional Elective II

S.No	Course Code	Course Title
1	2270237	Renewable Energy Systems
2	2270238	Power Semiconductor Drives
3	2270439	Power System Reliability

PE III – Professional Elective III

S.No	Course Code	Course Title
1	2270240	Industrial Electrical Systems
2	2270424	Signals and Systems
3	2270241	Electric and Hybrid Vehicles

PE IV - Professional Elective IV

S.No	Course Code	Course Title
1	2280242	HVDC Transmission
2	2280243	Utilization of Electrical Energy
3	2280244	Computer Aided Electrical Machine Design

PE V - Professional Elective V

S.No	Course Code	Course Title
1	2280245	Power Quality & FACTS
2	2280246	Modern Control Theory
3	2280247	AI Techniques In Electrical Engineering

PE VI - Professional Elective VI

S.No	Course Code	Course Title
1	2280xxx	Cyber-Physical Systems
2	2280249	Electrical Distribution Systems
3	2280250	Machine Learning Applications in Electrical Engineering

EEE- Open Electives

S.No	Open Elective	Course Code	Course Title
1	O E - I	2250240	Industrial Electrical Systems
2	OE- II	2260204	IOT With Electrical Applications
3	O E - III	2270241	Electrical& Hybrid Vehicles

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

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2210001: MATRIX ALGEBRA AND CALCULUS(Common to all)

I Year B. Tech EEE – I Sem.

L	T	P	C
3	1	0	4

Course Prerequisites: Mathematical Knowledge at pre-university level

Course Objectives:

- 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 eigen vectors and to reduce the quadratic form to canonical form
- Geometrical approach to the mean value theorems and their application to the mathematical problems. Evaluation of improper integrals using Beta and Gamma functions.
- Partial differentiation, concept of total derivative and Finding maxima and minima of function of two and three variables
- Evaluation of multiple integrals and their applications

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

UNIT-I: Matrices

- Write the matrix representation of a set of linear equations and to analyses 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.
- Solve the applications on the mean value theorems, and evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas, volumes

.

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 by Gauss elimination method, Gauss Seidel Iteration Method.

UNIT-II: Eigen values and Eigen vectors

Eigen values, Eigen vectors and their properties, Diagonalization of a matrix, Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem, Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

UNIT-III: Calculus

Mean value theorems: Rolle's Theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem, Taylor's Series (without proofs). Definition of Improper Integral: Beta and Gamma functions and their applications

UNIT-IV: Multivariable Calculus (Partial Differentiation and applications)

Partial Differentiation: Euler's Theorem, Total derivative, Jacobian, Functional dependence-independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration)

Evaluation of Double Integrals (Cartesian and polar coordinates), change of order of integration (only Cartesian form), Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and triple integrals (Cartesian to Spherical and Cylindrical polar coordinates).Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals).

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition,2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5thEditon,2016.

REFERENCE BOOKS:

1. Erwin kreyszig, Advanced Engineering Mathematics, 9thEdition, John Wiley & Sons,2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition, Pearson, Reprint, 2002.
3. H. K. Dassand Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, NewDelhi.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

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2210009:ENGINEERING CHEMISTRY

I Year B. Tech EEE – I Sem

L	T	P	C
3	1	0	4

Course Objectives:

- To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
- To include the importance of water in industrial usage, fundamental aspects of battery chemistry, significance of corrosion it's control to protect the structures.
- To imbibe the basic concepts of petroleum and its products.
- To acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

Course Outcomes:

- Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
- The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
- They can learn the fundamentals and general properties of polymers and other engineering materials.
- They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT - I: Water and its treatment:

Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and break - point chlorination. Defluoridation- Determination of F- ion by ion- selective electrode method. Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion- exchange processes. Desalination of water – Reverse osmosis.

UNIT – II Battery Chemistry & Corrosion

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

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods.

UNIT - III: Polymeric materials:

Definition – Classification of polymers with examples – Types of polymerization – addition (free radical addition) and condensation polymerization with examples – Nylon 6:6, Terylene

Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation,

Properties and engineering applications of PVC and Bakelite, Teflon, Fiber reinforced plastics (FRP).

Rubbers: Natural rubber and its vulcanization.

Elastomers: Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokol rubber.

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

Biodegradable polymers: Concept and advantages - Polylactic acid and poly vinyl alcohol and their applications.

UNIT - IV: Energy Sources:

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

UNIT - V: Engineering Materials:

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

Smart materials and their engineering applications

Shape memory materials- Poly L- Lactic acid. Thermoresponse materials- Polyacryl amides, Poly vinyl amides

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

TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
2. Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016
3. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.
4. Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications.

REFERENCE BOOKS:

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

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2210501: PROGRAMMING FOR PROBLEM SOLVING

L	T	P	C
3	0	0	3

I Year B. Tech EEE – I Sem

Course Objectives:

- To learn the fundamentals of computers.
- To understand the various steps in program development.
- To learn the syntax and semantics of the C programming language.
- To learn the usage of structured programming approaches in solving problems.

Course Outcomes: The student will learn

- To write algorithms and to draw flowcharts for solving problems.
- To convert the algorithms/flowcharts to C programs.
- To code and test a given logic in the 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.
- Searching and sorting problems.

UNIT - I: Introduction to Programming

Compilers, compiling and executing a program.

Algorithm – Flowchart / Pseudocode withexamples, Program design and structured programming **Introduction to C Programming Language:** variables (with data types and space requirements),Syntax and Logical Errors in compilation, object and executable code, Operators, expressions andprecedence, Expression evaluation, Storage classes (auto, extern, static and register), type conversion,The main method and command line arguments Bitwise operations: Bitwise AND, OR, XOR and NOT operators

Conditional Branching and Loops: Writing and evaluation of conditionals and consequent branchingwith if, if-else, switch-case, ternary operator, goto, Iteration with for, while, do- while loops

I/O: Simple input and output with scanf and printf, formatted I/O, Introduction to stdin, stdout andstderr.Command line arguments

UNIT - II: Arrays, Strings, Structures and Pointers:

Arrays: one and 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

Structures: Defining structures, initializing structures, unions, Array of structures

Pointers: Idea of pointers, Defining pointers, Pointers to Arrays and Structures, Use of Pointers in self- referential structures, usage of self referential structures in linked list (no implementation) Enumerationdata type

UNIT - III: Preprocessor and File handling in C:

Preprocessor: Commonly used Preprocessor commands like include, define, undef, if, ifdef, ifndef Files: Text and Binary files, Creating and Reading and writing text and binary files, Appending data to existing files, Writing and reading structures using binary files, Random access using fseek, ftell and rewind functions

UNIT - IV: Function and Dynamic Memory Allocation:

Functions: Designing structured programs, Declaring a function, Signature of a function, Parameters and return type of a function, passing parameters to functions, call by value, Passing arrays to functions,passing pointers to functions, idea of call by reference, Some C standard functions and libraries

Recursion: Simple programs, such as Finding Factorial, Fibonacci series etc., Limitations of Recursive functions Dynamic memory allocation: Allocating and freeing memory, Allocating memory for arrays ofdifferent data types

UNIT - V: Searching and Sorting:

Basic searching in an array of elements (linear and binary search techniques), Basic algorithms to sort array of elements (Bubble, Insertion and Selection sort algorithms), Basic concept of order of complexitythrough the example programs

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice HallofIndia
2. E. Balagurusamy, Computer fundamentals and C, 2nd Edition, McGraw-Hill
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB
4. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
5. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
6. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition
7. Byron Gottfried, Schaum‘s Outline of Programming with C, McGraw-Hill

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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(2210221)ELECTRICAL CIRCUITS ANALYSIS –I

B.Tech. I Year – I Sem.

L	T	P	C
3	0	0	3

Prerequisites: Mathematics

Course Objectives:

- To analyse knowledge in circuits and to understand the fundamentals of derived circuit laws.
- To provide steady state and transient analysis of single phase and 3-phase circuits.
- To identify Theorems and concepts of coupled circuits
- To understand the topological description of Networks**.**

Course Outcomes

After completion of this course the student is able to

- Analyse the network analysis, techniques using mesh and node analysis.
- Comprehend steady state and transient behavior of circuits for DC and AC excitations.
- Identify the electric circuits using network theorems and concepts of coupled circuits.
- Comprehend the topological networks.

UNIT-I

Network Elements & Laws: Active elements, Independent and dependent sources. Passive elements — R, L and C, Energy stored in inductance and capacitance, Kirchhoff's laws, Source transformations, Star-delta transformations, Node voltage method, Mesh current method including super node and super mesh analysis.

Learning Outcomes:

At the end of this unit, the student will be able to

- Explain the need of circuit elements. (L2)
- Analyse the resistive circuits with independent sources. (L4)
- Solve D.C. circuits by using KVL and KCL. (L3)

Unit-II

AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power and power factor. Analysis of single-phase ac circuits consisting of R, L, C, and RL, RC, RLC combinations (series only). Resonance: Series and parallel circuits, Bandwidth and Q-factor.

Learning Outcomes:

At the end of this unit, the student will be able to

- Develop an understanding of the fundamental laws and elements of A.C circuits. (L3)
- Learn the properties of Resonance for series and parallel combinations. (L2)
- Explain the concept of steady state. (L2)

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UNIT-III

Network theorems: Superposition theorem, Thevinin‘s theorem, Norton‘s theorems, Maximum power.transfer theorem, Tellegen‘s theorem, Compensation theorem, Milliman‘s theorem and Reciprocity theorem. (AC & DC)

Learning Outcomes:

At the end of this unit, the student will be able to

- Demonstrate knowledge of Various theorems in DC and AC. (L3)
- Determine various circuits using different theorems. (L5)
- Identify the theorems for simple circuits solving (L3)
- Illustrate the performance characteristics of different theorems. (L3)

UNIT-IV:

Poly-phase Circuits: Analysis of balanced and unbalanced 3-phase circuits, Star and delta connections, Measurement of three-phase power for balanced and unbalanced loads.

Learning Outcomes:

At the end of this unit, the student will be able to

- Explain the energy properties of electric elements and the techniques to measure voltage and current. (L2)
- Perform the star and delta combinational three phase loads. (L3)
- Explain different types of loads. (L2)

UNIT-V

Coupled circuits: Concept of self and mutual inductance, Dot convention, Coefficientof coupling, Analysis of circuits with mutual inductance.

Topological Description of Networks: Graph, tree, chord, cut-set, incident matrix, circuit matrix and cut-set matrix.

Learning Outcomes:

At the end of this unit, the student will be able to

- Understand principles of concepts of coupled circuits. (L2)
- Perform elementary explanation for Topological description of networks. (L3)

Text Books:

1. Van Valkenburg M.E, —Network Analysis‖, Prentice Hall of India, 3 rd Edition, 2000
2. Ravish R Singh, —Network Analysis and Synthesis‖, McGrawHill, 2 nd Edition, 2019

Reference Books:

1. B. Subramanyam, —Electric Circuit Analysis‖, Dreamtech Press & Wiley, 2021.
2. James W.Nilsson, Susan A.Riedel, —Electric Circuits‖, Pearson, 11th Edition, 2020
3. Jagan N.C, Lakshrninarayana C., —Network Analysis‖, B.S. Publications, 3 rd Edition, 2014.
4. A Sudhakar, Shyammohan S Palli, —Circuits and Networks: Analysis and Synthesis‖, McGraw Hill, 5 th Edition, 2017.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

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2210371: ENGINEERING DRAWING PRACTICE

	L	T	P	C
B.Tech. I Year – I Sem.	**1**	**0**	**4**	**3**

Pre-requisites: Knowledge in dimensions and units, Usage of geometrical instruments and analyticalability

Course objectives:

- To provide basic concepts in engineering drawing.
- To impart knowledge about standard principles of orthographic projection of objects.
- To draw sectional views and pictorial views of solids.

Course outcomes: After completion of the course the student is able to

- Familiarize with BIS standards and conventions used in engineering graphics. (L3)
- Draw various engineering curves e.g., ellipse, parabola, cycloids and involutes etc. andconstruct variousreduced scales e.g., plain and diagonal scale. (L2)
- Ability to draw orthographic projections and isometric projections of given engineering components.(L3)
- Visualize different views like elevation and plan for a given line, plane figures or solidobjects. (L2)
- Develop the lateral surfaces of simple solids. (L5)

Unit-I

Introduction To Engineering Drawing

Principles of Engineering Graphics and their Significance-Drawing Instruments and their Uses-Conventions in Drawing-BIS-Lettering and Dimensioning.

Geometrical Constructions: BisectingaLine, Arc.Dividing AL ineinto_ N‘ Equal Parts, Construction of Polygons, Division of Circleinto Equal Parts (8And12)

Construction of Scales: Plain and Diagonal Scale.

Conic Sections: Ellipse,Parabola,HyperbolaandRectangularHyperbola-GeneralMethodsonly.

Engineering Curves: Cycloid, Epicycloid, Hypocycloid.

Involutes: For Circle, Triangle, Square, Pentagon and Hexagon

LEARNING OUTCOME:

- To understand the basic standards, conventions of engineering drawing and how to use the instruments in drawing. (L1)
- Learn and draw the various types of curves used in engineering application. (L2)

UNIT – 2

Orthographic Projections

Principles- Assumptions- Different Angles of Projection.
Projections of Points- Located in all the quadrants
Projections of Lines- Parallel, Perpendicular, inclined to one plane and inclined to bothplanes.
Projections of Planes: Simple and auxiliary position of a plane.

LEARNING OUTCOME:

- Knowledge in various planes of projections. (L1)
- To draw the front view, top view and side views of the given geometrical elements. (L2)

UNIT – 3

Projections Of Solids

Classification of solids- simple and inclined to one plane position of Prisms, Pyramids, Cylinder and Cone

LEARNING OUTCOME:

- To understand the various solid types. (L2)
- To draw all the views of the given solid in all possible orientations. (L3)

UNIT – 4

Section Of Solids

Types of Section Planes, Sectioning of Prisms, Pyramids, Cylinders and Cones.

Development Of surfaces

Development of surfaces of right Regular Solids- Parallel Line Method, Radial Line Method

LEARNING OUTCOME:

- Toidentifythecutsurfacesandrepresentthesectionalviewsgraphically when thesolidis sectioned. (L4)
- To develop the surfaces of solid using various methods. (L5)

UNIT – 5

Isometric Projections

Principles, Isometric Views of Planes, Solids- Box Method, Offset Method, Compound solids, Sectioned
Solids. Conversion of Isometric to Multi view projection. And vice versa

LEARNING OUTCOME:

- Knowledge in principles of isometric projection. (L2)
- Conversion of isometric to orthographic and vice-versa. (L2)

TEXT BOOKS:

1. N.D.Bhatt, Elementary Engineering Drawing, Charotar Publishers,2012.
2. K.Veenugopal, –Engineering Drawing and Graphics + AutoCAD New Age International Pvt. Ltd, 2011.

REFERENCE BOOKS:

1. Engineering graphics with Auto CAD- R.B. Choudary/Anuradha Publishers Engineering Drawing- Johle/Tata Macgraw Hill.
2 Basanth Agrawal and C M Agrawal –Engineering Drawing 2nd Edition -McGraw-Hill Education (India) Pvt.Ltd.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2210276: Elements of Electrical and Electronics Engineering Laboratory

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 Ohms Law
2.Verification of KVL and KCL
3.Verification of superposition theorem.
4.Verification of Thevenin‘s and Norton‘s theorem.
5.Calculations and Verification of Impedance and Current of RL, RC and RLC series circuits.
6.Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single PhaseTransformer
7.Performance Characteristics of a Separately/Self Excited DC Shunt/Compound Motor.
8.Open Circuit and Short Circuit Tests on 1-phase Transformer

Any two experiments from the given list

9. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
10. Verification of Reciprocity and Milliman‘s Theorem.
11. Verification of Maximum Power Transfer Theorem.
12. Determination of form factor for non-sinusoidal waveform
13. Transient Response of Series RL and RC circuits for DC excitation

TEXTBOOKS:

1. D.P. Kothari and I. J. Nagrath, Basic Electrical Engineering, Tata McGraw Hill, 4th Edition, 2019.
2. MS Naidu and S Kamakshaiah, Basic Electrical Engineering, Tata McGraw Hill, 2nd Edition, 2008.

REFERENCE BOOKS:

1. P.Ramana, M.Suryakalavathi, G.T.Chandrasheker,Basic Electrical Engineering, S.Chand, 2nd Edition, 2019.

2. D. C. Kulshreshtha, Basic Electrical Engineering, McGraw Hill, 2009

3. M.S.Sukhija, T.K.Nagsarkar, —Basic Electrical and Electronics Engineering‖, Oxford, 1st Edition, 2012.

4. Abhijit Chakrabarthi, Sudipta Debnath, Chandan Kumar Chanda, —Basic Electrical Engineering‖, 2nd Edition, McGraw Hill, 2021.

5. L.S. Bobrow, Fundamentals of Electrical Engineering‖, Oxford University Press, 2011.
6. E.Hughes, Electrical and Electronics Technology‖, Pearson, 2010. 7. V. D. Toro, —Electrical Engineering Fundamentals‖, Prentice Hall India, 1989

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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2210009: 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 requiredfor engineering student. The student will learn:

- Estimation of hardness of water to check its suitability for drinking purpose.
- Students are able to perform estimations of acids and bases using conductometry, potentiometry andpH metry methods.
- Students will learn to prepare polymers such as Bakelite and nylon-6 in the laboratory.
- Students will learn skills related to the lubricant properties such as saponification value, surfacetension and viscosity of oils.

Course Outcomes: The experiments will make the student gain skills on:

- Determination of parameters like hardness of water and rate of corrosion of mild steel in variousconditions.
- Able to perform methods such as conductometry, potentiometry and pH metry in order to find outthe concentrations or equivalence points of acids and bases.
- Students are able to prepare polymers like bakelite and nylon-6.
- Estimations saponification value, surface tension and viscosity of lubricant oils.

List of Experiments:

I. Volumetric Analysis: Estimation of Hardness of water by EDTA Complexometry method.
II. Conductometry: Estimation of the concentration of an acid by Conductometry.
III. Potentiometry: Estimation of the amount of Fe+2 by Potentiomentry.
IV. pH Metry: Determination of an acid concentration using pH meter.
V. Preparations:
1. Preparation of Bakelite.
2. Preparation Nylon – 6.

II. Lubricants:
1. Estimation of acid value of given lubricant oil.
2. Estimation of Viscosity of lubricant oil using Ostwald‘s Viscometer.

III. Corrosion: Determination of rate of corrosion of mild steel in the presence and absence of inhibitor.
IV. Virtual lab experiments
1. Construction of Fuel cell and its working.
2. Smart materials for Biomedical applications
3. Batteries for electrical vehicles.
4. Functioning of solar cell and its applications.

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REFERENCE BOOKS:

1. Lab manual for Engineering chemistry by B. Ramadevi and P. Aparna, S Chand Publications, New Delhi (2022)
2. Vogel's text book of practical organic chemistry 5th edition
3. Inorganic Quantitative analysis by A.I. Vogel, ELBS Publications.
4. College Practical Chemistry by V.K. Ahluwalia, Narosa Publications Ltd. New Delhi (2007).

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AUTONOMOUS)

2210571: PROGRAMMING FOR PROBLEM SOLVING LABORATORY

B.Tech. I Year - I Sem.

L	T	P	C
0	0	2	1

Course Objectives: The students will learn the following:

- To work with an IDE to create, edit, compile, run and debug programs
- To analyze the various steps in program development.
- 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.
- To create, read from and write to text and binary files

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

- Formulate the algorithms for simple problems
- Able to develop programs based on condition checking
- Implement pyramid programs
- Able to perform matrix applications
- Modularize the code with functions so that they can be reused

Course Objectives: The students will learn the following:

- To work with an IDE to create, edit, compile, run and debug programs
- To analyze the various steps in program development.
- To develop programs to solve basic problems by understanding basic concepts in C likeoperators, control statements etc.
- To develop modular, reusable and readable C Programs using the concepts like functions,arrays etc.
- To create, read from and write to text and binary files

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

- Formulate the algorithms for simple problems
- Able to develop programs based on condition checking
- Implement pyramid programs
- Able to perform matrix applications
- Modularize the code with functions so that they can be reused
- Create, read and write to and from simple text and binary files

Simple numeric problems:

a. Write a program for the simple, compound interest.
b. Write a program to implement bit-wise operators.
c. Write a program for converting Fahrenheit to Celsius.
d. Write a simple program that converts one given data type to another using auto conversionand casting. Take the values from standard input.
e. Writeasimpleprogramtofindlargestoftwoandthreenumbersusingconditionaloperator.
f. Writeaprogramforswappingtwonumberswithandwithoutusingthirdvariableandusingbitwise operators

.

Condition branching and statements:

a. Write a program for finding larges of three numbers.
b. Write a program that declares Class awarded for a given percentage of marks, wheremarks<40%=Failed, 40% to<60% = Second class, 60% to<70%=First class, >=70%=Distinction. Read percentage from standard input.
c. Write a C program to find the roots of a Quadratic equation.
d. Write a C program, which takes two integer operands and one operator from the user, performs theoperation and then prints the result. (Consider the operators +,-,*, /, %and use Switch Statement)

Condition branching and loops:

a. Write a program to find whether the given number is a prime or not.
b. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
c. Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, number=5 and no. of rows = 3, the output should be:

    5x1=5
    5x2=10
    5x3=15

d. Write a program that shows the binary equivalent of a given positive number between0to255.
e. 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.
f. Write a C program to generate all the prime numbers between 1 and n, where n is a value suppliedby the user.
g. Write a C program to calculate the following ,where x is a fractional value.$1-x/2+x^2/4-x^3/6$
h. 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=3 and x=5, then the program compute1+5+25+125.
i. Write a C program to construct a pyramid of numbers as follows:

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1	*	1	1	*
12	**	23	22	**
123	***	456	333	***
			4444	**
				*

j. Write a C program to find given number is Armstrong number or not.
k. Write a C program to find given number is Perfect number or not.

Arrays, Strings, Pointers and Structures:

a. Write a C program to find the minimum, maximum and average in an array of integers.

b. Write a program to compute Mean, Variance, Standard Deviation, Sorting of n elements insingle dimension array.

c. Write a C program that perform the following:
   i. Addition of Two Matrices
   ii. Multiplication of Two Matrices
   iii. Transpose of a matrix with memory dynamically allocated for the new matrix as row andcolumn counts may not be same.

d. Write a C program that sorts a given array of names.

e. Write a C program that perform the following operations:
   i. To insert a sub-string into a given main string from a given position.
   ii. To delete n Characters from a given position in a given string.

f. Write a program for reading elements using pointer in to array and display the values using array.
g. Write a program for display values reverse order from array using pointer.
h. Write a program through pointer variable to sum of n elements from array.
i. Write a program to implement student information by using structure to function.
j. Write a program to sort student id or name using structures.

Functions:

a. Write a C program to find factorial of a given number using functions.
b. Write a C program to perform swapping using functions.
c. Write a C program to find LCM, GCD of two numbers using functions.
d. Write a C program to implement sorting using functions.
e. Write a C program to create and print two dimensional array using functions.
f. Write a C program to find factorial of a given number using recursion.
g. Write a C program to find Fibonacci series using recursion
h. Write a C program to implement Towers of Hanoi problem using recursion.

Files:

a. Write a C program to display the contents of a file to standard out put device.
b. Write a C program which copies one file to another, replacing all lower case characters with theirupper case equivalents.
c. Write a C program to count the occurrence of a character in a text file. The file name and thecharacter are supplied as command line arguments.
d. Write a C program to merge two files in to a third file (i.e. ,the contents of the first file followed bythose of these cond are put in the third file).

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CASE STUDY I: Develop Sample Student Data base

Create a structure to specify data on students given below: Roll number, Name, Department, Course, Yearof joining

Assume that there are not more than 15 students in the collage.

(a) Write a function to print names of all students who joined in a particular year.
(b) Write a function to print the data of a student whose roll number is given.

CASE STUDY 2: Perform simple Bank Transactions

Create a structure to specify data of customers in a bank. The data to be stored is: Account number,Name, Balance in account. Assume maximum of 20 customers in the bank.

(a) Write a function to print the Account number and name of each customer with balance below Rs.100.

(b) If a customer request for withdrawal or deposit, it is given in the form: Acct. no, amount, code (1for deposit, 0 for withdrawal)

Write a program to give a message, –The balance is insufficient for the specified with drawalll.

CASE STUDY 3: Provide Serial Numbers for Engine parts

An automobile company has serial number for engine parts starting from AA0 to FF9. The other characteristics of parts to be specified in a structure are: Year of manufacture, material and quantity manufactured.

(a) Specify a structure to store information corresponding to a part.
(b) Retrieve information on parts with serial numbers between BB1 and CC6.

Reference Books

1. Byron Gottfried, Schaum"s Outline of Programming with C, Mc Graw-Hill
2. Let us C by YashavantKanetkar BPB publications(16th Edition)
3. B.A.ForouzanandR.F.GilbergCProgrammingandDataStructures,CengageLearning,(3rd Edition)
4. BrianW.KernighanandDennisM.Ritchie,TheCProgrammingLanguage,PrenticeHallofIndia
5. R. G. Dromey, How to solve It by Computer, Pearson(16th Impression)
6. Programming in C, Stephen G.Kochan, Fourth Edition, and Pearson Education.
7. Herbert Schildt, C:TheCompleteReference, McGrawHill,4th Edition.

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(AUTONOMOUS)

2220002: DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS(Common to all)

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

3 1 0 4

Pre-requisites: Mathematical Knowledge at pre-university level

Course Objectives: To learn

- Methods of solving the differential equations of first order and first degree.
- Concept of higher order liner differential equations.
- Concept, properties of Laplace transforms, solving ordinary differential equations by usingLaplace transforms techniques.
- The physical quantities involved in engineering field related to vector valued functions.
- The basic properties of vector valued functions and their applications to line, surfaceand volume integrals.

Course outcomes: After learning the contents of this paper the student able to

- Identify whether the given first order differential equation is exact
- Solve higher differential equation and apply the concept of differential equationto real world problems.
- Use the Laplace transforms techniques for solving ODE's.
- Apply the Del operator to scalar and vector point functions.
- Evaluate the line, surface and volume integrals and converting them from one to another.

UNIT-I: First Order ODE

Exact differential equations, Equations reducible to exact differential equations, linear and Bernoulli's equations, Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling, Law of natural growth and decay.

UNIT-II: Ordinary Differential Equations of Higher Order

Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type eax, sin ax , cos ax, polynomials in x, eax V(x) and x V(x), method of variation of parameters, Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

UNIT-III: Laplace transforms

Laplace Transforms: Laplace Transform of standard functions, First shifting theorem, Second shifting theorem, Unit step function, Dirac delta function, Laplace transforms of functions when they are multiplied and divided by _t', Laplace transforms of derivatives and integrals of function, Evaluation of integrals by Laplace transforms, Laplace transform of periodic functions, Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV: Vector Differentiation

Vector point functions and scalar point functions, Gradient, Divergence and Curl, Directional derivatives, Vector Identities, Scalar potential functions, Solenoidal and Irrotational vectors.

UNIT-V:Vector Integration

Line, Surface and Volume Integrals, Theorems of Green, Gauss and Stokes (without proofs) and their applications.

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition,2010
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Edition,2016.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9thEdition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3. H. K. Dassand Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, NewDelhi.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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2220008: APPLIED PHYSICS

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

Prerequisites: 10 + 2 Physics

Course Objectives: The objectives of this course for the student are to:

- Understand the basic principles of quantum physics and band theory of solids.
- Understand the underlying mechanism involved in construction and working principles ofvarious semiconductor devices.
- Study the fundamental concepts related to the dielectric, magnetic and energy materials.
- Identify the importance of nanoscale, quantum confinement and various fabricationstechniques.
- Study the characteristics of lasers and optical fibres.
-

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

- Understand physical world from fundamental point of view by the concepts of Quantum
- mechanics and visualize the difference between conductor, semiconductor, and an insulator byclassification of solids.
- Identify the role of semiconductor devices in science and engineering Applications.
- Explore the fundamental properties of dielectric, magnetic materials and energy for theirapplications.
- Appreciate the features and applications of Nanomaterials.
- Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.

UNIT - I: QUANTUM PHYSICS AND SOLIDS

Quantum Mechanics: Introduction to quantum physics, Blackbody radiation, Photoelectric effect, de-Broglie Hypothesis, Matter waves, Davisson and Germer experiment, Heisenberg uncertainty principle, Born interpretation of the wave function, Time independent Schrodinger's wave equation, Particle in one dimensional potential box.
Solids: Free electron theory (Drude & Lorentz, Sommerfeld) (qualitative), Bloch's theorem -Kronig-Penney model, Effective mass of an electron, Origin of energy bands, Classification of solids

UNIT - II: SEMICONDUCTORS AND DEVICES

Intrinsic and Extrinsic semiconductors, Hall effect, Direct and Indirect band gap semiconductors, Construction, Principle of operation and characteristics of P-N Junction diode, Zener diode and bipolar junction transistor (BJT) - LED, PIN diode, Avalanche photo diode (APD) and solar cells, their structure, Materials, Working principle and characteristics.

UNIT - III: DIELECTRIC, MAGNETIC AND ENERGY MATERIALS

Dielectric Materials: Basic definitions, Types of polarizations (qualitative), Ferroelectric, Piezoelectric, and Pyroelectric materials, Applications.
Magnetic Materials: Domain theory of ferromagnetism, Soft and Hard magnetic materials, Magnetostriction, Magnetoresistance, Applications.
Energy Materials: Conductivity of liquid and solid electrolytes, Superionic conductors, Materials and electrolytes for super capacitors.

UNIT - IV: NANOTECHNOLOGY

Nanoscale, Quantum confinement, Surface to volume ratio, Bottom-up fabrication: Sol-gel, precipitation methods, Top-down fabrication: Ball milling, Physical vapor deposition (PVD), Characterization techniques: XRD, SEM and TEM, Applications of nano materials.

UNIT - V: LASER AND FIBER OPTICS

Lasers: Laser beam characteristics, Three quantum processes, Einstein coefficients and their relations, Lasing action, Population inversion, Pumping methods, Ruby laser, He-Ne laser, Nd:YAG laser, Applications of laser.
Fiber Optics: Introduction to optical fibers, Total internal reflection, Construction of optical fiber, Classification of optical fibers, Acceptance angle - Numerical aperture, Losses in optical fibers, Optical fiber for communication system, Applications of optical fibers.

TEXT BOOKS:

1. M. N. Avadhanulu, P.G. Kshirsagar & TVS Arun Murthy‖ A Text book of EngineeringPhysics‖, S. Chand Publications, 11th Edition 2019.
2. Engineering Physics by Shatendra Sharma and Jyotsna Sharma, Pearson Publication,2019
3. Semiconductor Physics and Devices- Basic Principle – Donald A, Neamen, Mc Graw Hill,4th Edition, 2021.
4. B.K. Pandey and S. Chaturvedi, Engineering Physics, Cengage Learning, 2nd Edition,2022.
5. Essentials of Nanoscience & Nanotechnology by Narasimha Reddy Katta, TypicalCreatives NANO DIGEST, 1st Edition, 2021.

REFERENCE BOOKS:

1. Quantum Physics, H.C. Verma, TBS Publication, 2nd Edition 2012.
2. Fundamentals of Physics – Halliday, Resnick and Walker, John Wiley &Sons,11th Edition,2018.
3. Introduction to Solid State Physics, Charles Kittel, Wiley Eastern, 2019.
4. Elementary Solid State Physics, S.L. Gupta and V. Kumar, Pragathi Prakashan, 2019.
5. A.K. Bhandhopadhya - Nano Materials, New Age International, 1stEdition, 2007.
6. Energy Materials a Short Introduction to Functional Materials for Energy Conversion and Storage Aliaksandr S. Bandarenka, CRC Press Taylor & Francis Group
7. Energy Materials, Taylor & Francis Group, 1st Edition, 2022.

MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AUTONOMOUS)

2220372: ENGINEERING WORK SHOP

B.Tech. I Year -II Semester **L T P C**

0 1 3 2.5

Course Objectives:

- To Study of different hand operated power tools, uses and their demonstration.
- To gain a good basic working knowledge required for the production of various engineeringproducts.
- To provide hands on experience about use of different engineering materials, tools,equipments and processes those are common in the engineering field.
- To develop a right attitude, team working, precision and safety at work place.
- It explains the construction, function, use and application of different working tools,Equipment and machines

Course Outcomes:

- Explain the design and model different prototypes in the carpentry trade such as Cross lapjoint, Dove tail joint. (L4)
- Demonstrate the design and model various basic prototypes in the trade of fitting such asStraight fit, V- fit. (L4)
- Understand to make various basic prototypes in the trade of Tin smithy such as rectangulartray, and open Cylinder. (L4)
- Demonstrate the design and model various basic prototypes in the trade of Welding. (L4)
- Explain to make various basic prototypes in the trade of Black smithy such as J shape, and S shape. (L4)
- Understand to perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring, Go down wiring. (L4)

UNIT I - CARPENTRY & FITTING

- **Carpentry** – Introduction, Carpentry tools, sequence of operations and applications (T-LapJoint, Dovetail Joint, Mortise & Tenon Joint)
- **Fitting** – Introduction, fitting tools, sequence of operations and applications (V-Fit, DovetailFit & Semi-circular fit)

Learning Outcomes**:** Students should be able to,

- Understand the trade of carpentry and fitting. (L2)
- Explain the tools involved in manufacturing operations. (L3)
- Evaluate the applications of carpentry and fitting. (L4)

UNIT II - TIN SMITHY AND BLACKSMITHY

- **Tin-Smithy** – Introduction, Tin smithy tools, sequence of operations and applications (SquareTin, Rectangular Tray & Conical Funnel).
- **Blacksmithy**- Introduction, Blacksmithy tools, sequence of operations and applications (Roundto Square, Fan Hook and S-Hook)

Learning Outcomes**:**Students should be able to,

- Understand the oldest manufacturing methods. (L2)
- Describe the sequence of operations involved. (L3)
- Explain the safety precautions and tools usage. (L4)

UNITIII - HOUSE WIRING AND WELDING

- **House-wiring** – Introduction, Electrical wiring tools, sequence of operations and applications(Parallel & Series, Two-way Switch and Tube Light)
- **Welding Practice** – Introduction, electrode, welding tools, and sequence of operations.Advantages and applications (Arc Welding)

Learning Outcomes:

- Students should be able to,
- Discuss the topic of Heat engines.(L3)
- Identify types of Heat engines cycles.(L5)
- Evaluate the Factors affecting routing procedure, Route Sheet.(L4)

Text Books:

1. Workshop Practice /B. L. Juneja / Cengage
2. Workshop Manual / K. Venugopal / Anuradha.

References:

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

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(AUTONOMOUS)

2220010: English for Skill Enhancement

B.Tech. I Year-II Sem

L	T	P	C
2	0	0	2

Course Objectives: This course will enable the students to:

- Improve the language proficiency of students in English with an emphasis on Vocabulary,Grammar, Reading and Writing skills.
- Develop study skills and communication skills in various professional situations.
- Equip students to study engineering subjects more effectively and critically using thetheoretical and practical components of the syllabus.

Course Outcomes: Students will be able to:

- Understand the importance of vocabulary and sentence structures.
- Choose appropriate vocabulary and sentence structures for their oral andwrittencommunication.
- Demonstrate their understanding of the rules of functional grammar.
- Develop comprehension skills from the known and unknown passages.
- Take an active part in drafting paragraphs, letters, essays, abstracts, précis andreports invarious contexts.
- Acquire basic proficiency in reading and writing modules of English.

UNIT - I

Chapter entitled _***Toasted English*' by R.K.Narayan** from ***"English: Language, Context andCulture"*** published by Orient BlackSwan, Hyderabad.

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

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

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

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

UNIT - II

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

Vocabulary: Words Often Misspelt - Homophones, Homonyms and Homographs
Grammar: Identifying Common Errors in Writing with Reference to Noun-pronounAgreementand Subject-verb Agreement.
Reading: Sub-Skills of Reading – Skimming and Scanning – Exercises for Practice

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

UNIT - III

Chapter entitled **'Lessons from Online Learning' by F.Haider Alvi, Deborah Hurst et al** from ***"English: Language, Context and Culture"*** published by Orient BlackSwan, Hyderabad. **Vocabulary**: Words Often Confused - Words from Foreign Languages and their Use in English.**Grammar:** Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.

Reading: Sub-Skills of Reading – Intensive Reading and Extensive Reading – Exercises forPractice.

Writing: Format of a Formal Letter-Writing Formal Letters E.g.., Letter of Complaint,Letter ofRequisition, Email Etiquette, Job Application with CV/Resume.

UNIT - IV

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

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

UNIT - V

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

Vocabulary: Technical Vocabulary and their Usage
Grammar: Common Errors in English (*Covering all the other aspects of grammar which werenotcovered in the previous units*)
Reading: Reading Comprehension-Exercises for Practice
Writing: Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Note: *Listening and Speaking Skills which are given under Unit-6 in AICTE Model Curriculum arecovered in the syllabus of ELCS Lab Course.*

- **Note: 1**. As the syllabus of English given in AICTE *Model Curriculum-2018 for B.Tech FirstYear is* ***Open-ended,*** besides following the prescribed textbook, it is required to prepare teaching/learning materials **by the teachers collectively** in the form of handouts based on theneeds of the students in their respective colleges for effective teaching/learning in the class.

- **Note**: **2**.Based on the recommendations of NEP2020, teachers are requested to beflexible to adopt Blended Learning in dealing with the course contents .They are advised to teach 40 percent of each topic from the syllabus in blended mode.

TEXT BOOK:

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

REFERENCE BOOKS:

1. Effective Academic Writing by Liss and Davis (OUP)
2. Richards, Jack C. (2022) Interchange Series. Introduction, 1,2,3. Cambridge UniversityPress
3. Wood, F.T. (2007). Remedial English Grammar. Macmillan.
4. Chaudhuri, Santanu Sinha. (2018). Learn English: A Fun Book of Functional Language,Grammar and Vocabulary. (2nd ed.,). Sage Publications India Pvt. Ltd.
5. (2019). Technical Communication. Wiley India Pvt. Ltd.
6. Vishwamohan, Aysha. (2013). English for Technical Communication for EngineeringStudents. Mc Graw-Hill Education India Pvt. Ltd.
7. Swan, Michael. (2016). Practical English Usage. Oxford University Press. Fourth Edition