



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

Sponsored by CMR Educational Society

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – ‘A’ Grade - ISO 9001:2015 Certified)

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BACHELOR OF TECHNOLOGY ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE (Batches admitted from the academic year 2022 - 2023)

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**B TECH ELECTRICAL & ELECTRONICS ENGINEERING
COURSE STRUCTURE**

I Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R22A0001	English	2	0	0	2	40	60
2	R22A0023	Mathematics –I	3	1	0	4	40	60
3	R22A0021	Applied Physics	3	1	0	4	40	60
4	R22A0022	Engineering Chemistry	3	0	0	3	40	60
5	R22A0501	Programming for Problem Solving	3	0	0	3	40	60
6	R22A0082	Applied Physics/Engineering Chemistry Lab	-	0	3	1.5	40	60
7	R22A0083	Engineering and Computing Hardware Workshop	-	0	2	1	40	60
8	R22A0581	Programming for Problem Solving Lab	-	0	3	1.5	40	60
9	R22A0003	Human Values and Professional Ethics	2	0	0	0	40	60
		Total	16	2	8	20	360	540

I Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R22A0002	Professional English	2	0	0	2	40	60
2	R22A0024	Mathematics – II	3	1	0	4	40	60
3	R22A0201	Principles of Electrical and Electronics Engineering	3	0	0	3	40	60
4	R22A0301	Computer Aided Engineering Graphics	2	0	3	4	40	60
5	R22A0502	Problem Solving using Python Programming	3	0	0	3	40	60
6	R22A0081	English Language and Communication Skills Lab	-	0	2	1	40	60
7	R22A0281	Principles of Electrical and Electronics Engineering Lab	-	0	3	1.5	40	60
8	R22A0582	Problem Solving using Python Programming Lab	-	0	3	1.5	40	60
9	R22A0004	Environmental Science	2	0	0	0	40	60
		Total	15	1	11	20	360	540

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B TECH ELECTRICAL & ELECTRONICS ENGINEERING- COURSE STRUCTURE

II Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R22A0025	Numerical Methods and Complex variables	3	1	0	4	40	60
2	R22A0202	Electrical Machines-I	3	1	0	4	40	60
3	R22A0204	Electrical Circuit Analysis	3	0	0	3	40	60
4	R22A0205	Power System-I	3	0	0	3	40	60
5	R22A0207	Electro Magnetic Fields	3	0	0	3	40	60
6	R22A0282	Electrical Machines Laboratory-I	0	0	2	1	40	60
7	R22A0284	Electrical Circuits Analysis Lab	0	0	2	1	40	60
8	R22A0285	Electrical Simulation tools Laboratory	0	0	2	1	40	60
9	*R22A0005	Foreign Language: French / Gender sensitization Laboratory	0	0	2	0	100	-
		Total	15	2	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

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1	R22A0353	Solid Mechanics & Hydraulic Machines	3	0	0	3	40	60
2	R22A0208	Measurements and Instrumentation	3	0	0	3	40	60
3	R22A0203	Electrical Machines-II	3	0	0	3	40	60
4	R22A0461	Analog & Digital Electronics	3	0	0	3	40	60
5	R22A0206	Power System-II	3	0	0	3	40	60
6	R22A0471	Analog & Digital Electronics Laboratory	0	0	2	1	40	60
7	R22A0286	Measurements and Instrumentation Laboratory	0	0	2	1	40	60
8	R22A0283	Electrical Machines Laboratory- II	0	0	2	1	40	60
9	R22A0291	Real-time Research Project/ Field Based Project	0	0	4	2	40	60
10	*R22A0061	Public Policy and Governance/Constitution of India	2	0	0	0	100	-
		Total	17	0	10	20	460	540

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

III Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1		Power Electronics	3	0	0	3	40	60
2		Control Systems	3	0	0	3	40	60
3		Open Elective-I	3	0	0	3	40	60
4		Professional Elective-I	3	0	0	3	40	60
5		Business Economics and Financial Analysis	3	0	0	3	40	60
6		Control Systems Laboratory	-	0	2	1	40	60
7		Power Electronics Laboratory	-	0	2	1	40	60
8		Advanced English Communication Skills Laboratory	-	0	2	1	40	60
9		Application Development- I	0	0	4	2	100	0
		Total	15	0	10	20	420	480

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

III Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1		Open Elective-II	3	0	0	3	40	60
2		Professional Elective-II	3	0	0	3	40	60
3		Digital Signal Processing	3	0	0	3	40	60
4		Power System Protection	3	0	0	3	40	60
5		Microprocessors & Microcontrollers	3	0	0	3	40	60
6		Power Systems Laboratory	-	0	2	1	40	60
7		Microprocessors & Microcontrollers Laboratory	-	0	2	1	40	60
8		Digital Signal Processing Laboratory	0	0	2	1	40	60
9		Application Development- II	0	0	4	2	40	60
10		Environmental Science	2	0	0	0	100	-
		Total	17	0	10	20	360	540

Environmental Science in III Yr II Sem Should be Registered by Lateral Entry Students Only.

IV Year B. Tech – I Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1		Power Electronic Applications to Renewable Energy Systems	3	1	0	4	40	60
2		Power System Operation and Control	3	0	0	3	40	60
3		Professional Elective-III	3	0	0	3	40	60
4		Professional Elective-IV	3	0	0	3	40	60
5		Wind and Solar Energy systems	3	0	0	3	40	60
6		Simulation of Renewable Energy Systems Laboratory	-	0	2	1	40	60
7		Project Phase - I	-	0	6	3	40	60
		Total	15	1	8	20	280	420

IV Year B. Tech – II Semester

S.No	Subject Code	SUBJECT	L	T	P	C	MAX. MARKS	
							INT	EXT
1		Innovation, Startup & Entrepreneurship	4	0	0	4	40	60
2		Professional Elective-V	3	0	0	3	40	60
3		Professional Elective-VI	3	0	0	3	40	60
4		Project Phase – II	0	0	20	10	80	120
		Total	10	0	20	20	200	300

Professional Elective - I

1	IoT Applications in Electrical Engineering
2	Cyber-Physical Systems
3	Computer Aided Electrical Machine Design

Professional Elective – II

1	High Voltage Engineering
2	Power Semiconductor Drives
3	Power System Reliability

Professional Elective-III

1	Mobile Application Development
2	Automation with PLC

3	Electric and Hybrid Vehicles
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Professional Elective-IV

1	HVDC Transmission
2	Industrial and Allied Electrical Systems
3	Embedded Systems Applications

Professional Elective-V

1	Power Quality & FACTS
2	Solar Power Batteries
3	AI Techniques in Electrical Engineering

Professional Elective-VI

1	Smart Grid Technologies
2	Electrical Distribution Systems
3	Machine Learning Applications to Electrical Engineering

OPEN ELECTIVES**Open Elective-I:**

1	Renewable Energy Sources
2	Java Programming
3	Web Development
4	Intellectual Property Rights
5	Robotics And Automation
6	Electronics For Health Care
7	Principles of Data Science

Open Elective-II:

1	Fundamental of Electric Vehicles
2	Data Base Systems
3	Big Data Architecture
4	Design Thinking
5	Principles Of Cloud Computing
6	IOT And Its Applications
7	Nano Technology

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****2 /- /-/2****(R22A0001) ENGLISH****INTRODUCTION**

English is a global language which is a means to correspond globally. Keeping in account of its vital role in the global market, emphasis is given to train the students to acquire language and communication skills. The syllabus is designed to develop and attain the competency in communicative skills.

The lectures focus on the communication skills and the selected excerpts support as resources for the teachers to develop the relevant skills in the students. The lessons stimulate discussions and help in comprehending the content effectively. The focus is on skill development, nurturing ideas and practicing the skills.

COURSE OBJECTIVES:

1. To enable students to enhance their lexical, grammatical and communicative competence.
2. To equip the students to study the academic subjects with better perspective through theoretical and practical components of the designed syllabus.
3. To familiarize students with the principles of writing and to ensure error-free writing
4. To sharpen the speaking skills of learners by involving them in diverse activities such as group discussions, debates, conversations and role plays.
5. To train students in soft skills with the help of case studies.

SYLLABUS**Reading Skills:****Objectives**

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To augment the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.,
 - Skimming the text
 - Understanding the gist of an argument
 - Identifying the topic sentence
 - Inferring lexical and contextual meaning
 - Understanding discourse features
 - Recognizing coherence/sequencing of sentences
 - Scanning the text

NOTE:

The students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:**Objectives**

1. To develop an awareness in the students about basic formal writing skills.
2. To equip students with the components of different forms of writing, beginning with the required ones:
 - Writing sentences
 - Use of appropriate vocabulary
 - Coherence and cohesiveness
 - Formal and informal letter writing

Unit –I**J K Rowling's Convocation Speech at Harvard**

Grammar	– Tenses and Question Tags
Vocabulary	– word Formation - Affixes, Writing
Writing	– Paragraph Writing
Reading	– The art of skimming and
scanning	- Reading Exercise Type 1
(Match the statements to the text they refer to)	

Unit – II**"The Road not taken" by Robert Frost**

Grammar	– Direct and Indirect Speech
Vocabulary	– One-Word Substitutes, Standard Abbreviations, Synonyms and Antonyms
Writing	– Essay Writing (Introduction, body and conclusion)
Reading	– Reading –The art of Intensive and Extensive -Reading Exercise Type 2

Unit – III**Satya Nadella's Email to His Employees on his First Day as CEO of Microsoft**

Grammar	– Voices
Vocabulary	– Transitive and Intransitive
Writing	– E-mail Writing, Letter Writing (complaints, requisitions, apologies).
Reading	– Reading Comprehension- Reading Exercise Type 3 (Reading between the lines)

Unit – IV**"Abraham Lincoln's Letter to His Son's Teacher"**

Grammar	– Articles, Punctuation
Vocabulary	– Phrasal Verbs
Writing	– Précis Writing
Reading	– Reading Exercise Type 4 (Cloze test)

Unit –V**Abdul Kalam's Biography**

Grammar	–	Subject-Verb Agreement, Noun-
Pronoun Agreement Vocabulary	–	Commonly Confused Words
Writing	–	Memo Writing
Reading	-	Reading Exercise Type 5 (Identifying errors)

* Exercises apart from the textbook shall also be used for classroom tasks.

REFERENCE BOOKS:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan. 2007
3. <https://www.britannica.com/biography/A-P-J-Abdul-Kalam>
4. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press. 2006.
5. Communication Skills. Sanjay Kumar and Pushpa Lata. Oxford University Press. 2011.

COURSE OUTCOMES:**After completion of the course students will be able to:**

1. Gain competence and proficiency in 'productive' skills, i.e., writing and speaking with the recognition of the need for life-long learning of the same
2. Hone their language abilities in terms of comprehending complex technical texts with a potential to review literature
3. Present ideas clearly and logically to analyze data and provide valid conclusions in written communication
4. Enrich their grammatical accuracy and fluency to be adept at both the active and passive skills
5. Represent old conventions with a set of the new by professional verbal communicative ability.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/ C****3/1/-/ 4****(R22A0023)MATHEMATICS -I****COURSE OBJECTIVES: To learn**

- The concept of a Rank of the matrix and applying the concept to know the consistency and solving the system of linear equations.
- The concept of Eigen values, Eigen vectors and Diagonalisation.
- The maxima and minima of functions of several variables.
- The Applications of first order ordinary differential equations.
- The methods to solve higher order differential equations.

UNIT I: Matrices

Introduction ,Types of matrices ,Rank of a matrix - Echelon form and Normal form, Consistency of system of linear equations (Homogeneous and Non-Homogeneous)-Gauss elimination method and Gauss-Siedel iteration method.

UNIT II: Eigen values and Eigen vectors

Linear dependence and independence of vectors, Eigen values and Eigen vectors and their properties, Diagonalisation 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: Multi Variable Calculus (Differentiation)

Functions of two variables, Limit, Continuity, Partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobian-functional dependence and independence, Maxima and minima and saddle points, Method of Lagrange multipliers, Taylors theorem for two variables.

UNIT IV: First Order Ordinary Differential Equations

Exact, Equations reducible to exact form, Applications of first order differential equations - Newton's law of cooling, Law of natural growth and decay, Equations not of first degree- Equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type

UNIT V : Differential Equations of Higher Order

Linear differential equations of second and higher order with constant coefficients: Non-homogeneous term of the type $f(x) = e^{ax}$, $\sin ax$, $\cos ax$, x^n , $e^{ax} V$ and $x^n V$ - Method of variation of parameters, Equations reducible linear ODE with constant coefficients-Cauchy's Euler equation and Legendre's equation.

Text Books

- i) Higher Engineering Mathematics by B V Ramana ., Tata McGraw Hill.
- ii) Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
- iii) Advanced Engineering Mathematics by Kreyszig ,John Wiley & Sons .

Reference Books

- i) Advanced Engineering Mathematics by R.K Jain & S R K Iyenger, Narosa Publishers.
- ii) Ordinary and Partial Differential Equations by M.D. Raisinghania, S.Chand Publishers
- iii) Engineering Mathematics by N.P Bali and Manish Goyal.

Course Outcomes: After learning the concepts of this paper the student will be able to

- 1. Analyze the solution of the system of linear equations and to find the Eigen values and Eigen vectors of a matrix.
- 2. Reduce the quadratic form to canonical form using orthogonal transformations.
- 3. Find the extreme values of functions of two variables with / without constraints.
- 4. Solve first order, first degree differential equations and their applications.
- 5. Solve higher order differential equations.
- 6. Analyze the nature of sequence and series.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH – I - SEM****L/T/P/C****3/1/-/4****(R22A0021) APPLIED PHYSICS****COURSE OBJECTIVES:**

- 1 To understand the basic principles of lasers and optical fibers.
- 2 To interpret dual nature of the matter and behavior of a particle quantum mechanically.
- 3 To classify the solids depending upon electrical conductivity.
- 4 To understand the concepts of semiconductors and devices.
- 5 To analyze dielectric and magnetic properties of the materials.

UNIT – I**LASERS & FIBER OPTICS****(15 Hours)**

Lasers: Characteristics of lasers, Absorption, Spontaneous and stimulated emissions, Einstein's Coefficients, Population inversion, meta stable state, types of pumping, lasing action, construction and working of Ruby Laser, Helium-Neon Laser, Semiconductor diode Laser, Applications of lasers.

Fiber Optics: Introduction to optical fiber, Construction and working principle of an Optical Fiber, Acceptance angle and Numerical aperture, Types of Optical fibers - Mode and index profile, Losses in optical fiber, Optical Fiber in Communication System, Applications of optical fibers.

UNIT – II**QUANTUM MECHANICS****(10 Hours)**

Wave nature of particles, de Broglie's hypothesis, matter waves, Heisenberg's uncertainty principle, Davisson and Germer's experiment, G.P Thomson experiment, Schrodinger time-independent wave equation-significance of wave function, Particle in one dimensional square well potential.

UNIT – III**FREE ELECTRON THEORY OF METALS****(12 Hours)**

Free electron theory (Classical & Quantum)- Assumptions, Merits and drawbacks, Fermi level, Density of states, Periodic potential, Bloch's theorem, Kronig – Penny model (qualitative), $E - k$ diagram, Effective mass, Origin of energy bands in solids, Classification of materials : Metals, semiconductors and insulators.

UNIT-IV**SEMICONDUCTOR PHYSICS****(15 Hours)**

Intrinsic and Extrinsic semiconductors, Direct and Indirect band gap semiconductors, Carrier concentration in intrinsic and extrinsic semiconductors. Dependence of Fermi level on carrier concentration and temperature, Formation of PN Junction, V-I characteristics of PN Junction diode, Energy Diagram of PN diode, Hall effect, semiconductor materials for optoelectronic devices - LED, Photo diode, Solar cell.

UNIT – V**DIELECTRICS AND MAGNETIC PROPERTIES OF MATERIALS****(12 Hours)**

Dielectrics: Introduction, Types of polarizations – Electronic, Ionic and Orientation polarization (qualitative) and calculation of polarizabilities, Internal fields in Solid, Clausius-Mossotti relation, Piezo-electricity and Ferro-electricity.

Magnetism: Introduction, Classification of Dia, Para, Ferro magnetic materials based on magnetic moment, Properties of Anti-Ferro and Ferri magnetic materials, Hysteresis curve based on domain theory, Soft and Hard magnetic materials.

COURSE OUTCOMES:

- 1 Can apply the principles of laser to understand various lasers and fiber optic systems.
- 2 Basic principles of quantum mechanics can be used to analyze the microscopic behavior of a particle.
- 3 Classification of solids can be made by understanding the band structure of solids.
- 4 Concepts of semiconductors can be applied to predict the importance of electronic devices relevant to engineering domains.
- 5 Examine dielectric, magnetic properties of the materials and apply them in material technology.

TEXT BOOKS:

1. Engineering Physics by Kshirsagar & Avadhanulu, S. Chand publications.
2. Modern Engineering Physics-Dr K Vijaya Kumar & Dr S Chandralingam, S. Chand Publications.
3. Engineering Physics- B.K.Pandey, S.Chaturvedi, Cengage Learning.

REFERENCES:

1. Engineering Physics – R.K. Gaur and S.L. Gupta, Dhanpat Rai Publishers.
2. Engineering Physics, S Mani Naidu- Pearson Publishers.
3. Engineering physics 2nd edition –H.K. Malik and A.K. Singh.
4. Engineering Physics – P.K. Palaniswamy, Scitech publications.
5. Physics by Resnick and Haliday.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****2/0/0/2****(R22A0022) ENGINEERING CHEMISTRY****COURSE OBJECTIVES:** The students will be able to

1. Acquire the knowledge of electrochemistry and batteries which are essential for the engineers and in industry.
2. Analyze engineering problems related to corrosion and develop different corrosion control techniques.
3. Identify different types of polymers, composites and their applications in various engineering fields.
4. Gain knowledge on wide variety of advanced materials like nano and smart materials which have excellent engineering properties.
5. Analyze water for its various parameters and its significance in industrial and domestic applications.

Unit I Electrochemistry (8 hours)

Introduction - Types of cells - Electrolytic and Electrochemical cells (construction and working of Galvanic Cell) - Electrode potential- Cell potential (EMF); Nernst equation and its applications; Electrochemical series and its applications. Batteries - Classification of batteries - primary, secondary and fuel cells with examples. Primary cells - Lithium cells; Secondary cells - Lead acid battery and Lithium ion battery; Fuel cells - Differences between battery and a fuel cell; Construction, working and applications of H_2-O_2 fuel cell.

Unit II Corrosion: (8 hours)

Causes and effects of corrosion – Theories of corrosion - Chemical (oxidation) and Electrochemical corrosion – mechanism of electrochemical corrosion (Evolution of Hydrogen and Absorption of Oxygen); Corrosion control methods - Cathodic protection - Sacrificial anode and Impressed current cathodic methods; Surface coatings – methods of application - Electroplating (Cu-plating) and Electroless plating (Ni-plating) - advantages and applications of electroplating/electroless plating.

Unit III Water and its treatment: (8 hours)

Introduction – hardness of water – causes of hardness; Types of hardness - temporary and permanent – expression and units of hardness-numerical problems; Potable water and its specifications; Disinfection of water by chlorination and ozonization. Boiler troubles - caustic embrittlement, scales and sludges; External treatment of water – Ion exchange process; Desalination of water – Reverse osmosis.

Unit IV Polymers: (10 hours)

Introduction - Classification of polymers; Types of polymerization - addition and condensation polymerisation with examples. **Plastics** - thermoplastic and thermosetting resins; preparation, properties and engineering applications of Polyvinylchloride (PVC), Teflon (PTFE), and Bakelite. **Rubbers** - Natural rubber and its vulcanization. **Conducting polymers** - classification of conducting polymers – mechanism of conduction in trans-Polyacetylene and applications of conducting polymers. **Bio-degradable polymers** – preparation, properties and applications of Poly-Lactic acid. **Composite materials:** Introduction - Fibre reinforced plastics (FRPs) - Glass fibre reinforced, Carbon fibre reinforced plastics and their applications.

Unit V Advanced Materials: (8 hours)

Nanomaterials: Introduction and classification of nanomaterials; preparation of nanomaterials - Sol-gel method; applications of nanomaterials (industrial and medicinal); Carbon nanotubes (CNTs)-applications.

Smart materials: Introduction - Types of smart materials - examples and applications of piezoelectric materials and shape memory alloys.

Suggested Text Books:

1. Engineering Chemistry by P.C. Jain & M. Jain: Dhanpat Rai Publishing Company (P) Ltd, New Delhi. 16th Edition.
2. Engineering Chemistry by Prasanta Rath, B. Rama Devi, C. H. Venkata Ramana Reddy, Subhendu Chakroborty, Cengage Learning Publication, India Private Limited, 2018.
3. Engineering Analysis of Smart Material Systems by Donald J. Leo, Wiley, 2007.

Reference Books:

1. Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publishing Company (P) Ltd, New Delhi.
2. Engineering Chemistry, by S. S. Dara, S. Chand & Company Ltd, New Delhi.
3. P.W. Atkins, J.D. Paula, "Physical Chemistry", Oxford, 8th edition (2006).
4. B.R. Puri, L.R. Sharma and M.S. Pathania, "Principles of Physical Chemistry", S. Nagin Chand & Company Ltd., 46th edition (2013).

COURSE OUTCOMES: The student will be able to

1. Relate the knowledge of operating principles of various types of electrochemical cells, including batteries, to optimize the need for sustainable development.
2. Analyze and develop technically sound, economic and sustainable solutions for complex engineering problems related to corrosion and its effects.
3. Identify, formulate and develop polymeric compounds used in various engineering materials for futuristic engineering applications.
4. Apply the knowledge of nanotechnology and smart materials to find solutions for various engineering problems.
5. Familiarize with the fundamentals of water treatment technologies and the considerations for its design and implementation in water treatment plants.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****3/-/-/3****(R22A0501) PROGRAMMING FOR PROBLEM SOLVING****COURSE OBJECTIVES:**

1. To Understand the use of computer system in problem solving and to build program logic with algorithms and flowcharts.
2. To learn the syntax and semantics of C programming language.
3. To learn the usage of structured programming approach in solving problems.
4. To learn the usage of strings and pointers.
5. Understand the usage of structures and files.

UNIT - I: Introduction to Programming:

Computer Languages, Compilers, Compiling and executing a program, Representation of Algorithms and Flowcharts with examples.

Introduction to C Programming Language:

Structure of a C Program, I/O: Simple input and output with scanf() and printf(), C Tokens- Keywords, Identifiers, Constants, Variables, Data types, Operators, Expressions and precedence, Expression evaluation, Type conversion.

UNIT - II: Conditional Branching and Arrays:

Control Structures – Selection Statements (Decision Making)- if and switch statements, nested if-else, Iteration and loops: use of while, do-while and for loops, nested loops, use of goto, break and continue statements.

Arrays: Definition, one and two dimensional arrays, creating, accessing and manipulating elements of arrays.

UNIT - III: Designing Structured Programs using Functions:

Functions: Declaring a function, Categories of functions, passing parameters to functions: call by value, call by reference, passing arrays to functions, Scope- Local Vs Global, Storage classes, Recursion with example programs.

UNIT - IV: Strings and Pointers:

Strings: Introduction to strings, Declaration and Initialization, String input/output functions, String manipulation functions with example programs, Array of Strings.

Pointers: Defining pointers, Declaration and Initialization, accessing variables through pointers, Pointers to arrays, Pointers to functions, Pointers to structures, Command line arguments, Enumeration data type, Dynamic Memory Management Functions: malloc(), calloc(), realloc() and free().

UNIT - V: Structures and File handling in C:

Structures: Defining structures, Declaration and Initialization, Array of structures, unions.

Files: Text and Binary files, Opening and Closing files, File input /output functions, Creating and Reading and writing text files, Appending data to existing files.

TEXT BOOKS:

1. Jeri R. Hanly and Elliot B.Koffman, Problem solving and Program Design in C 7th Edition, Pearson.
2. Mastering C, K.R.Venugopal, S R Prasad, Tata McGraw-Hill Education.
3. Computer Programming, E.Balagurusamy, First Edition, TMH.
4. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. Yashavant Kanetkar, Let Us C, 18th Edition, BPB.
3. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
4. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition.

COURSE OUTCOMES: The student will be able

1. To write algorithms and to draw flowcharts for solving problems.
2. To convert the algorithms/flowcharts to C programs.
3. To code and test a given logic in the C programming language.
4. To decompose a problem into functions and to develop modular reusable code.
5. To use arrays, pointers, strings, structures and files to write C programs.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****-/-/3/1.5****(R22A0082) APPLIED PHYSICS LAB/ENGINEERING CHEMISTRY LAB****COURSE OBJECTIVES:**

1. To experience the mechanical oscillations and resonance phenomena.
2. To verify the concepts of light.
3. To analyze voltage/current phase behavior of RC and LCR circuits.
4. To study the characteristics of semiconductor devices.
5. To understand the concepts of laser.

LIST OF EXPERIMENTS:

1. Melde's experiment –Frequency of electrical vibrator.
2. Newton's Rings –Radius of curvature of Plano convex lens.
3. Laser -Wave length of light by using Diffraction grating.
4. CR circuit – Time constant of RC circuit.
5. LCR Circuit- Quality factor and resonance frequency of LCR circuit.
6. LED -Characteristics of LED.
7. Solar cell -Characteristics of Solar cell.
8. Optical fiber- Numerical aperture of an optical fiber.
9. Torsional pendulum- Rigidity modulus of given wire (demonstrative).
10. Hall Effect – Hall coefficient of semiconducting samples (demonstrative).

REFERENCE BOOKS:

1. Practical physics by Dr. Aparna, Dr K.V Rao, V.G.S. Publications.
2. Engineering physics practical lab manual – MRCET

COURSE OUTCOMES:

1. Students can compare the elastic constants of different metallic wires, and also determine the ac frequency of vibrating bar.
2. Students can illustrate the interference of light phenomena.
3. Wavelength of the given laser can be determined by using diffraction phenomenon
4. By understanding electrical principles, Time constant of RC and resonance phenomenon of LCR circuits can be analyzed.
5. V-I characteristics of various semiconductor devices can be illustrated.

(R22A0082) ENGINEERING CHEMISTRY LAB**COURSE OBJECTIVES:**

The students will be able:

1. To understand and explain scientifically the various chemistry related problems in the industry/engineering and develop experimental skills for building technical competence.
2. To familiarize with the practical implementation of fundamental concepts.
3. To gain hands on experience in handling the instruments.
4. To demonstrate the digital and instrumental methods of analysis.
5. To correlate the practical aspects with theoretical concepts.

List of Experiments**Titrimetry:**

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Ferrous ion by Dichrometry

Instrumental Methods**Conductometry:**

3. Estimation of concentration of HCl by Conductometric titrations.
4. Estimation of concentration of Acetic acid by Conductometric titrations.

Potentiometry:

5. Estimation of concentration of HCl by Potentiometric titrations.
6. Estimation of amount of Fe^{2+} by Potentiometric titration using KMnO_4 .

Colorimetry:

7. Estimation of Copper by Colorimetric method.

Preparation

8. Preparation of a Polymer-**Bakelite**

Physical Property

9. Determination of Surface Tension of a given liquid by Stalagmometer.

Corrosion control method

10. Electroplating of Copper on an Iron object.

Text Book:

1. Inorganic quantitative analysis, Vogel
2. A text book on experiments and calculation in Engineering Chemistry by S.S. Dara

Suggested Readings:

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Text Book of engineering chemistry by R. N. Goyal and HarrmendraGoel, Ane Books Private Ltd.

COURSE OUTCOMES:

The students will be able:

1. To estimate the total hardness present in a sample of water.
2. To know the strength of an acid by conductometric and potentiometric methods.
3. To find the amount of Cu^{2+} present in unknown sample using colorimetric method.
4. To prepare a thermosetting polymer.
5. To determine the surface tension of a given liquid.
6. To understand the electroplating method for corrosion protection of metals.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****-/-/2/1****(R22A0083) ENGINEERING AND COMPUTING HARDWARE WORKSHOP****It is consisting of 2 parts: Part I: Computing Hardware Workshop****Part II: Engineering Workshop****COURSE OBJECTIVES:**

- Understand the internal structure of computer system and learn to diagnose minor problems with the computer functioning.
- Know the proper usage and threats of the World Wide Web & Study in detail about the various features of Ms-Word, Excel, PowerPoint and Google Forms
- To obtain the knowledge about Electrical wiring and Soldering – Desoldering procedures.
- To provide hands on experience in usage of different engineering materials, tools equipments and processes which are common in the engineering field.
- To develop professional attitude, team work, precision and safety practices at work place.

Part I: COMPUTING HARDWARE WORKSHOP**Task- 1: PC HARDWARE**

Identification of the peripherals of a computer, components in a CPU and its functions. Block diagram of the CPU along with the configuration of each peripheral. Functions of Motherboard. Assembling and Disassembling of PC. Installation of OS. Basic Linux commands.

Task- 2: TROUBLESHOOTING

Hardware Troubleshooting: Students are to be given a PC which does not boot due to proper assembly or defective peripherals and the students should be taught to identify and correct the problem.

Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

Task 3: INTERNET

Web Browsers, Access of websites, Surfing the Web, Search Engines, Customization of web browsers, proxy settings, bookmarks, search toolbars, pop-up blockers. Antivirus downloads, Protection from various threats.

MS OFFICE**Task 4: MICROSOFT WORD**

Overview of MS word features. Usage of Hyperlink, Symbols, Spell Check, Track Changes. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art,

Formatting Images, Textboxes, Paragraphs and Mail Merge in word. Using Word to create Project Certificate, Project Abstract, News Letter, Resume.

Task 5: MICROSOFT EXCEL

Overview of Excel Features Excel formulae & Functions, conditional formatting, Charts, Hyper linking, Renaming and Inserting worksheets, Data Analysis functions.

Creating a Scheduler (Features: - Gridlines, Format Cells, Summation, auto fill, Formatting)

Calculating GPA (Features: - Cell Referencing, Formulae and functions in excel)

Task 6: MICROSOFT POWER POINT

Overview of PowerPoint features, Insertion of images, slide transition, Custom animation, Hyperlinks.

Task 7: GOOGLE FORMS

Google forms introduction, opening Google forms, editing forms, add questions, copy duplicate questions, delete questions, required questions, more button, form color and themes, preview form, advance form settings, send form, view responses, close form

PART II: ENGINEERING WORKSHOP**A. List of Experiments:**

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lampwiring
3. Stair casewiring
4. Soldering and Desoldering practice – components, devices and circuits using general

1. Purpose PCB.

Note: Minimum ONE experiment need to be conducted in each trade

A. TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry:

To prepare T-Lap Joint, Dovetail Joint.

To prepare Mortise & Tenon Joint.

2. Fitting:

To prepare V-Fit, Dovetail Fit & Semi-circular fit.

3. Tin-Smithy:

To make Square Tin, Rectangular Tray & Conical Funnel.

Note: Minimum ONE experiment need to be conducted in each trade

Trades to demonstrate:

1. Plumbing
2. Foundry
3. Welding
4. Black smithy
5. Metal cutting (Water Plasma)

Note: Minimum a total of 3 trades to be demonstrated.

TEXT BOOKS – IT WORKSHOP

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education
2. Excel Functions and Formulae, Bernd held, Theodor Richardson, Third Edition

TEXT BOOKS – ENGINEERING WORKSHOP

1. Workshop Manual, P. Kannaiah and K. L. Narayana, 3rd Edition, Scitech, 2015
2. Printed Circuit Boards - Design, Fabrication, Assembly and Testing, R. S. Khandpur, Tata McGraw-Hill Education, 2005.

COURSE OUTCOMES:

- Ability to identify, assemble and troubleshoot the major components of a computer and perform the installation of Operating System.
- Capacity to make effective usage of the internet for academics and develop professional documents, spreadsheets and presentations.
- Students will be able to understand the domestic, illumination, stair-case wiring procedures and soldering de soldering practice
- The student will have hands-on experience on manufacturing of components using different trades of engineering processes

The student will be able to perform in a team, adhering to industrial safety practices and follow professional working standards.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****-/-/3/1.5****(R22A0581) PROGRAMMING FOR PROBLEM SOLVING LAB****COURSE OBJECTIVES:**

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

Practice sessions:

- a. 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.
- b. Write a simple program that converts one given data type to another using auto conversion and casting. Take the values from standard input.

Simple numeric problems:

- a. Write a program for finding the max and min from the three numbers.
- b. Write the program for the simple, compound interest.
- c. Write a program that declares Class awarded for a given percentage of marks, where mark
 $<40\% = \text{Failed}$, $40\% \text{ to } <60\% = \text{Second class}$, $60\% \text{ to } <70\% = \text{First class}$, $\geq 70\% = \text{Distinction}$. Read percentage from standard input.
- d. Write a program that prints a multiplication table for a given number and the number of rows in the table. For example, for a number 5 and rows = 3, the output should be:
 $5 \times 1 = 5$
 $5 \times 2 = 10$
 $5 \times 3 = 15$

Expression Evaluation:

- a. A building has 10 floors with a floor height of 3 meters each. A ball is dropped from the top of the building. Find the time taken by the ball to reach each floor. (Use the formula $s = ut + \frac{1}{2}at^2$ where u and a are the initial velocity in m/sec ($= 0$) and acceleration in m/sec^2 ($= 9.8 \text{ m/s}^2$)).
- b. 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).

- c. Write a C program to find the factorial of a given number.
- d. Write a C program to find the sum of individual digits of a positive integer and test given number is palindrome.
- 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 supplied by the user.
- g. Write a C program to find the roots of a Quadratic equation.

Arrays, Functions and Pointers:

- a. Write a C program to find the minimum, maximum and average in an array of integers.
- b. Write a C program that uses functions to perform the following:
 1. Addition of Two Matrices
 2. Multiplication of Two Matrices
- c. Write a C program to find the Transpose of a matrix.
- d. Write a function to swap the values of two variables using call by value.
- e. Write a function to swap the values of two variables using call by reference.
- f. Write C programs that use both recursive and non-recursive functions
 1. To find the factorial of a given integer.
 2. To find the GCD (greatest common divisor) of two given integers.
- g. Write a program for reading elements using a pointer into an array and display the values using the array.
- h. Write a program for display values reverse order from an array using a pointer.
- i. Write a program through a pointer variable to sum of n elements from an array.

Strings:

- a. Write a C program that uses functions to perform the following operations:
 1. To insert a sub-string into a given main string from a given position.
 2. To delete n Characters from a given position in a given string.
- b. 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.)
- c. Write a C program that displays the position of a character ch in the string S or -1 if S doesn't contain ch.
- d. Write a C program to count the lines, words and characters in a given text.

Structures:

- a. Write a C program to create a structure named book and display the contents of a book.

- b. Write a C program to create a structure named student and display the details of 5 students using array of structures.
- c. Write a C program to calculate total and percentage marks of a student using structure.

Files:

- a. Write a C program to display the contents of a file to standard output device.
- b. Write a C program which copies one file to another file.
- c. Write a C program to count the number of times a character occurs in a text file. The file name and the character are supplied as command line arguments.
- d. Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file).

Miscellaneous:

- a. Write a menu driven C program that allows a user to enter n numbers and then choose between finding the smallest, largest, sum, or average. The menu and all the choices are to be functions. Use a switch statement to determine what action to take. Display an error message if an invalid choice is entered.
- b. Write a C program to construct a pyramid of numbers as follows:

1	*	1
1 2	* *	2 2
1 2 3	* * *	3 3 3
		4 4 4 4

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, PHI.
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.

COURSE OUTCOMES:

After completion of the course, Students will be able to:

- formulate the algorithms for simple problems.
- identify and correct logical errors encountered during execution.
- represent and manipulate data with arrays, strings, structures and pointers.
- create, read and write to and from simple text and binary files.
- modularize the code with functions so that they can be reused.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - I- SEM****L/T/P/C****2/-/ - / -****(R20A0003) HUMAN VALUES AND PROFESSIONAL ETHICS****COURSE OBJECTIVES:**

This introductory course input is intended:

1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
2. To facilitate the development of a holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of value based living in a natural way.
3. To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.

UNIT - I:

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education: Understanding the need, basic guidelines, content and process for Value Education. Self-Exploration - what is it? - its content and process; 'Natural Acceptance' and Experiential Validation - as the mechanism for self-exploration. Continuous Happiness and Prosperity A look at basic Human Aspirations- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority. Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

UNIT - II:

Understanding Harmony in the Human Being - Harmony in Myself! : Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.

Understanding the needs of Self ('I') and 'Body' - Sukh and Suvidha. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).

Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail. Programs to ensure Sanyam and Swasthya.

UNIT - III:

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 meaning of Vishwas; Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.

Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astiva as comprehensive Human Goals. Visualizing a universal harmonious order in society - Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) - from family to world family!

UNIT - IV:

Understanding Harmony in the nature and Existence - Whole existence as Coexistence: Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature - recyclability and self-regulation in nature.

Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space. Holistic perception of harmony at all levels of existence.

UNIT - V:

Implications of the above Holistic Understanding of Harmony on Professional Ethics: Natural acceptance of human values, Definitiveness of Ethical Human Conduct, Basic for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics:

- a. Ability to utilize the professional competence for augmenting universal human order.
- b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
- c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
2. Prof. K. V. Subba Raju, 2013, Success Secrets for Engineering Students, Smart Student Publications, 3rd Edition.

REFERENCE BOOKS:

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E. F. Schumaner, 1973, Small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
A. N. Tripathy, 2003, Human Values, New Age International Publishers.
6. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.

7. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
8. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.
9. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna Values), Eastern Economy Edition, Prentice Hall of India Ltd.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website, <http://www.uptu.ac.in>
2. Story of Stuff, <http://www.storyofstuff.com>
3. Al Gore, An Inconvenient Truth, Paramount Classics, USA
4. Charle Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology - the Untold Story

COURSE OUTCOMES:

1. The students will be able to obtain happiness and prosperity in their life.
2. They will develop harmony at all levels.
3. They can have satisfying human behavior throughout their life

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P/C****2 /- /- /2****(R22A0002) PROFESSIONAL ENGLISH****INTRODUCTION:**

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

COURSE OBJECTIVES:

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

UNIT-I***"Mokshagundam Visvesvaraya"***

Speaking	- Description of Pictures, Places, Objects and Persons
Grammar	- 'If' Clauses
Vocabulary	- Homonyms, homophones and homographs
Writing	- Paragraph Writing

NOTE: Listening and speaking tasks are solely for lab purpose and not for testing in the examinations.

UNIT –II

Speaking	- Small Talks
Grammar	- Finite and Non-finite verbs
Vocabulary	- Standard Abbreviations (Mini Project)
Writing	- Job Application – Cover letter

NOTE: Listening and speaking tasks are solely for lab purpose and not for testing in the examinations.

Unit –III

- | | |
|------------|-------------------------------|
| Speaking | - Oral presentations |
| Grammar | - Transformation of Sentences |
| Vocabulary | - Idioms |
| Writing | - Abstract Writing |

NOTE: Listening and speaking tasks are solely for lab purpose and not for testing in the examinations.

Unit – IV**‘How a Chinese Billionaire Built Her Fortune’**

- | | |
|------------------------------|--|
| Speaking | - Telephonic Expressions and Conversations |
| Grammar | - Auxiliary verbs & model |
| Verbs, Degrees of Comparison | |
| Vocabulary | - Word Analogy |
| Writing | - Job Application - Resume |

NOTE: Listening and speaking tasks are solely for lab purpose and not for testing in the examinations.

Unit – V

- | | |
|------------|-------------------------------|
| Speaking | - Group discussion |
| Grammar | - Common Errors, Prepositions |
| Vocabulary | - Technical Vocabulary |
| Writing | - Report Writing |

NOTE: Listening and speaking tasks are solely for lab purpose and not for testing in the examinations.

REFERENCE BOOKS:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007
3. Skills Annexe & Epitome of Wisdom - B.Tech 1st Year English Study Material, JNTUH.
4. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press.2006.
5. Communication Skills. Sanjay Kumar and Pushpa Lata. Oxford University Press. 2011.
6. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press
7. ‘English for Engineers’. Cambridge University Press

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P /C****3 /1/-/4****(R22A0024) MATHEMATICS-II****OBJECTIVES:**

- The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data, also used to find the roots of an equation and to solve differential equations.
- The objective of interpolation is to find an unknown function which approximates the given data points and the objective of curve fitting is to find the relation between the variables x and y from given data and such relationships which exactly pass through the data (or) approximately satisfy the data under the condition of sum of least squares of errors.
- PDE aims at forming a function with many variables and also their solution methods, Method of separation of variables technique is learnt to solve typical second order PDE.
- Evaluation of multiple integrals.
- In many engineering fields the physical quantities involved are vector valued functions. Hence the vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.

UNIT – I: Interpolation

Interpolation: Introduction, errors in polynomial interpolation, Finite differences - Forward differences, Backward differences, central differences. Newton's formulae for interpolation, Gauss's central difference formulae, Interpolation with unevenly spaced points - Lagrange's Interpolation.

Curve fitting : Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares.

UNIT – II: Numerical Methods

Solution of algebraic and transcendental equations: Introduction, Bisection Method, Method of false position, Newton Raphson method and their graphical interpretations.

Numerical integration : Generalized quadrature - Trapezoidal rule, Simpson's $1/3^{\text{rd}}$ and Simpson's $3/8^{\text{th}}$ rules.

Numerical solution of ordinary differential equations: Solution by Taylor's series method, Euler's method, Euler's modified method, Runge-Kutta fourth order method.

UNIT III: Partial Differential Equations

Introduction, formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order Lagrange's linear equation and non-linear equations, Charpit's method, Method of separation of variables for second order equations and applications of PDE to one dimensional equation (Heat equation).

Unit IV: Double and Triple Integrals

Double and triple integrals (Cartesian and polar), Change of order of integration in double integrals, Change of variables (Cartesian to polar). Applications: Areas (by double integrals) and volumes (by double integrals and triple).

Unit V: Vector Calculus

Introduction, Scalar point function and vector point function, Directional derivative, Gradient, Divergence, Curl and their related properties, Laplacian operator, Line integral - work done, Surface integrals, Volume integral. Green's Theorem, Stoke's theorem and Gauss's Divergence Theorems (Statement & their Verification).

Text Books:

- a. Higher Engineering Mathematics by B V Ramana ., Tata McGraw Hill.
- b. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
- c. Mathematical Methods by S.R.K Iyenger, R.K.Jain, Narosa Publishers.

Reference Books:

- i) Elementary Numerical Analysis by Atkinson-Han, Wiley Student Edition.
- ii) Advanced Engineering Mathematics by Michael Greenberg –Pearson publishers.
- iii) Introductory Methods of Numerical Analysis by S.S. Sastry, PHI

Course Outcomes: After learning the contents of this paper the student will be able to

1. Find the most appropriate relation of the data variables using curve fitting and this method of data analysis helps engineers to understand the system for better interpretation and decision making.
2. Find the roots of algebraic, non algebraic equations.
3. Solve first order linear and non-linear partial differential equations.
4. Evaluate multiple integrals.
5. Evaluate the line, surface, volume integrals and converting them from one to another using vector integral theorems.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P/C****3/-/-/ 3****(R22A0201) PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING****COURSE OBJECTIVES:**

1. To understand the basic concepts of electrical circuits and analyze Circuits using Network Theorems.
2. To get overview of single phase A.C. circuits and three phase A.C. circuits.
3. To introduce the concept of DC Machines and Single-Phase Transformers.
4. To study the concepts of p-n diodes, rectifiers and Zener diodes.
5. To study the concepts of BJTs, JFET and MOSFETs.

UNIT –I: INTRODUCTION TO ELECTRICAL CIRCUITS: Concept of Circuit and Network, R-L-C Parameters, Ohms law and its limitations, Kirchhoff's Laws-KVL, KCL.

NETWORK ANALYSIS (D.C EXCITATION): Series and parallel connections of Resistive Networks, voltage division and current division, Meshanalysis, Nodal analysis

NETWORK THEOREMS: Thevenin's Theorem, Norton's Theorem and Superposition Theorem (for independent sources).

UNIT–II: SINGLE PHASE A.C. CIRCUITS: Average value, R.M.S. value, form factor and peak factor for sinusoidal wave form. Concept of phase, phasor representation of sinusoidal quantities phasedifference, Sinusoidal response of pure R, L, C.

THREE PHASE A.C. CIRCUITS: Advantages of Three phase over single phase, Voltage and Current relationship in star and delta connections.

UNIT-III:MACHINES:

DC Generator: principle of operation and working, Action of commutator, constructional features, basic concept of Lap and wave windings, emf equation.

DC Motor: principle of operation, Back emf and its significance, torque equation-Gross torque and Shaft torque.

Single Phase Transformer: principle of operation, emf equation, problems on emf equation.

UNIT–IV:

P-N JUNCTION DIODE: P-N junction diode, symbol and forward biased and reverse biased conditions, V-I characteristics of P-N junction diode, Half wave, Full wave and Bridge rectifiers.

ZENER DIODE: Symbol, construction, principle of operation and its applications.

UNIT–V:

BIPOLAR JUNCTION TRANSISTOR: Symbols, types, Construction and Principle of Operation of N-P-N and P-N-P transistors, Amplifying Action, Common Emitter, Common Base and Common Collector configurations.

JFET, Symbol, Construction, Principle of operation, and its Characteristics, MOSFET (Enhancement and Depletion mode) Symbol, Construction, Principle of Operation and its Characteristics.

TEXT BOOKS:

1. Engineering Circuit Analysis - William Hayt, Jack E. Kemmerly, S M Durbin, Mc GrawHill Companies.
2. Electric Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
3. Electrical Machines – P.S.Bimbra, Khanna Publishers.
4. “ElectronicDevices&Circuits”, SpecialEdition–MRCET,McGrawHillPublications,2017.
5. IntegratedElectronicsAnalogDigitalCircuits,JacobMillmanandD.Halkias,McGrawHill.
6. ElectronicDevicesandCircuits, S.Salivahanan, N.Sureshkumar, McGrawHill.

REFERENCE BOOKS

1. Network analysis by M.E Van Valkenburg, PHI learning publications.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. Electrical Circuits by A. Sudhakar, Shyammohan and S Palli, Mc Graw Hill Companies.
4. Electrical Machines by I.J. Nagrath & D. P. Kothari, Tata Mc Graw-Hill Publishers.
5. Electronic Devices and Circuits, K.LalKishore, B.S Publications
6. Electronic Devices and Circuits, G.S.N.Raju, I.K.International Publications, NewDelhi,2006.

COURSE OUTCOMES:

After the course completion the students will be able to

1. Apply the basic RLC circuit elements and its concepts to networks and circuits.
2. Analyze the circuits by applying network theorems to solve them to find various electrical parameters.
3. Illustrate the single-phase AC circuits along with the concept of impedance parameters and power.
4. Understand the Constructional Details and Principle of Operation of DC Machines and Transformers
5. To understand the concepts of p-n diode, rectifiers and Zener diode
6. To understand the concepts of BJTs, JFET and MOSFETs

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P/C****2/-/2/3****(R22A0301) COMPUTER AIDED ENGINEERING GRAPHICS****COURSE OBJECTIVES:**

- 1 To learn basic engineering graphics and Auto CAD concepts.
- 2 To learn the 2D principles of orthographic projections and Multiple views of the same
- 3 To know the planes and solid Projection
- 4 To gain the capability of designing 3D objects with isometric principles by using computer aided sketches
- 5 To know the conversion of Orthographic Views to isometric Views and isometric to Orthographic views

UNIT 1

Introduction to Auto CAD: Introduction to software interface Standard toolbar/menu, Understanding the co-ordinate systems-2D and 3D Visualisation, Setting the Paper sizes and title block importance, printing and plotting. **Draw commands:** line, arc, circle, rectangle, polygons, ellipse, polyline, splines, text. **Modify commands:** copy, mirror, offset, arrays, move, extend, break, trim, lengthen, chamfer, fillet.etc., **Constraints:** horizontal, vertical, parallel, concentric, perpendicular, symmetric, equal, collinear. **Dimensioning Commands:** Dimensioning and Dimension Style. **Division:** Line division, and circle division. **Polygons:** Constructing regular polygons - inscribed and circumscribed methods and general method.

UNIT 2

Projection of Points: Introduction to reference planes, four quadrants, importance of reference lines. Projection of points in all the four quadrants

Projection of Lines: Parallel to both the reference planes, Parallel to one plane and perpendicular to other plane, Inclined to one plane and parallel to other plane, Inclined to both planes

UNIT 3

Projections of Planes: Introduction to Regular planes. Parallel/Perpendicular to one reference plane, Inclined to one plane and Inclined to both the reference planes.

Projections of Solids: Introduction - Prisms, Pyramids, Cone and Cylinder, Axis parallel and perpendicular to one reference plane, Axis inclined to one reference plane.

UNIT 4

Isometric Projection: Introduction, Isometric projection of simple plane figures, Solids - right regular prisms, pyramids, cylinder, cone – H.P, V.P

UNIT 5

Conversions: Conversion of Isometric Views to Orthographic Views and Orthographic Views to Isometric Views

TEXT BOOKS:

1. Engineering Drawing – N.D. Bhatt & V.M. Panchal, 48th edition, 2005 Charotar Publishing House, Gujarat.
2. "Computer Aided Engineering Drawing" by Dr. M H Annaiah, Dr C N Chandrappa and Dr B Sudheer Prem Kumar Fifth edition, New Age International Publishers

REFERENCE BOOKS:

1. Computer Aided Engineering Drawing – S. Trymbaka Murthy, - I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition-2006.
2. Engineering Graphics - K.R. Gopalakrishna, 32nd edition, 2005- Subash Publishers, Bangalore.

COURSE OUTCOMES:

After the completion of course the student will be capable to

2. To produce geometric construction, dimensioning & Curves and detail drawings.
3. To compile Projections of points, lines, then create virtual drawing by using computer
4. To sketch the Planes and Solid Projections
5. To develop isometric drawings of simple objects reading the orthographic projections of those objects.
6. To understand and visualize the 3-D view of engineering objects. Elaborate the conversions of 2D -3D and Vice-Versa

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P/C
3/-/-/3****(R22A0502) PROBLEM SOLVING USING PYTHON PROGRAMMING****COURSE OBJECTIVES:**

This course will enable students

1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To develop Python programs with using arrays and functions.
4. To use Python data structures—lists, tuples, dictionaries.
5. To do input/output with files in Python.

UNIT-I

Introduction to Python Programming Language: Introduction to Python Language, Features of Python, Python Installation, Python Input and Output Statements, Numeric Data Types: int, float, boolean, complex and string and its operations, Standard Data Types: List, Tuples, Sets and Dictionaries, Data Type conversions, Comments in Python.

UNIT-II

Variables and Operators: Understanding Python variables, multiple variable declarations, Operators in Python: Arithmetic operators, Assignment operators, Comparison operators, Logical operators, Identity operators, Membership operators, Bitwise operators, Precedence of operators, Expressions.

Control Flow and Loops: Indentation, if statement, if-else statement, chained conditional if-elif -else statement, Loops: While loop, for loop using ranges, Loop manipulation using break, continue and pass.

UNIT- III

Arrays: Advantages of Arrays, Creating an Array, Importing the Array Module, Indexing and Slicing on Arrays, Types of arrays, working with arrays using numpy.

UNIT-IV

Functions: Defining a function, Calling Functions, Passing parameters and arguments, Python Function arguments: Positional Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Scope of the Variables in a Function—Local and Global Variables, Fruitful Functions, Anonymous functions or Lambda functions, Powerful Lambda functions in Python.

UNIT-V

File Handling in Python: Introduction to files, Text files and Binary files, Access Modes, Writing Data to a File, Reading Data from a File, File input / output functions.

Error Handling in Python: Introduction to Errors and Exceptions: Compile-Time Errors, Logical Errors, Runtime Errors, Types of Exceptions, Python Exception Handling Using try, except and finally statements.

COURSE OUTCOMES:

Upon completion of the course, students will be able to

1. Read, write, execute by hand simple Python programs.
2. Structure simple Python programs for solving problems.
3. Decompose a Python program into arrays and functions.
4. Represent compound data using Python lists, tuples, dictionaries.
5. Read and write data from/to files in Python programs.

TEXT BOOKS

1. R.NageswaraRao, "Core Python Programming", dream tech.
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist" 2nd edition, Updated for Python3, Shroff/O'Reilly Publishers, 2016.
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson.

REFERENCEBOOKS:

1. Core Python Programming, W.Chun, Pearson.
2. Introduction to Python, Kenneth A. Lambert, Cengage.
3. Learning Python, Mark Lutz, O'Reilly.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH -II- SEM****L/T/P/C****-/-/2/1****(R22A0081) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB**

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

OBJECTIVES:

1. To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
2. To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
3. To bring about a consistent accent and intelligibility in their pronunciation, ample speaking opportunities are provided.
4. To improve the fluency in spoken English and neutralize mother tongue influence
5. To train students to use language appropriately for interviews, group discussions and public speaking

English Language and Communication Skills Labs two parts:

A.Computer Assisted Language Learning (CALL) Lab

B.Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language and Communication Skills Lab

UNIT –I

CALL Lab: Introduction to Phonetics –Speech Sounds –Vowels and Consonants- Transcriptions

ICS Lab: Ice-Breaking activity - JAM session

UNIT –II

CALL Lab: Pronunciation: Past Tense Markers and Plural Markers

ICS Lab: Situational Dialogues/Role Plays—Greetings - Taking Leave – Introducing Oneself and Others - Requests and Seeking Permissions

UNIT–III

CALL Lab: Syllable and Syllabification

ICS Lab: Communication at Workplace- Situational Dialogues/Role Plays – Seeking Clarifications – Asking for and Giving Directions – Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice

UNIT –IV

CALL Lab: Word Stress and Intonation

ICS Lab:Information transfer – from visual to verbal - maps, charts, tables and graphs

UNIT –V

CALL Lab: Errors in Pronunciation- Accent - the Influence of Mother Tongue (MTI)
ICS Lab: Making a Short Speech - Extempore

ELCS Lab:**1. Computer Assisted Language Learning (CALL) Lab:**

The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

- i) P –IV Processor
 - a) Speed –2.8 GHZ
 - b) RAM –512 MB Minimum
 - c) HardDisk –80 GB
- ii) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab :

A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

DISTRIBUTION AND WEIGHTAGE OF MARKS**English Language Laboratory Practical Examination:**

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 30 marks and 70 year-end Examination marks. Of the 30 marks, 20 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the other institution.

OUTCOMES:

1. Learning with precision through computer-assisted individualized and independent language learning to work independently in engineering set up.
2. Improved conversational reception and articulation techniques in the course of repetitive instruction thereby gaining confidence both in institutional and professional environment.
3. Accuracy in pronunciation and restoring Standard English thereby crafting better command in English language so that the students have a cutting edge over others in society.
4. Imbibing appropriate use of language in situations to work as an individual and as a leader in diverse teams
5. Equip themselves with the pre-requisites, and relevant techniques to effectively attend corporate interviews

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P/C****-/-/3/1.5****(R22A0281) PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB****COURSE OBJECTIVES:**

1. To design an electrical system.
2. To analyze a given network by applying various circuit laws and network theorems.
3. To expose the students to the operation of DC machine and transformer.
4. To exhibit the students to the operation of PN junction diode and Zener diode.
5. To expose the students to the operation of Rectifier.

Among the following experiments any 10 are to be conducted

1. Verification of KVL and KCL.
2. Verification of Thevenin's theorem.
3. Verification of Norton's theorem.
4. Verification of Super position theorem.
5. Magnetization characteristics of DC shunt generator.
6. Speed control of DC shunt motor using armature control method.
7. Speed control of DC shunt motor using flux control method
8. Load test on single phase transformer.
9. PN Junction diode characteristics.
10. Zener diode characteristics.
11. Half wave rectifier.
12. Full wave rectifier.

COURSE OUTCOMES:**At the end of the course, students would be able to**

2. Explain the concept of circuit laws and network theorems and apply them to laboratory measurements.
3. Be able to systematically obtain the equations that characterize the performance of an electric circuit as well as solving them.
4. Perform the required tests on transformers and DC motors.
5. Plot the characteristics of Zener diodes.
6. Determine the working of rectifiers in detail.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH - II- SEM****L/T/P/C****-/-/3/1.5****(R22A0582) PROBLEM SOLVING USING PYTHON PROGRAMMING LAB****COURSE OBJECTIVES**

This course will enable the students:

1. Able to understand Syntax and Semantics and create Arrays and Functions in Python.
2. Able to learn different data types Lists, Dictionaries in Python.
3. Able to know how to execute the programs using loops and control statements.
4. Able to learn decision making and Functions in Python.
5. Able to know how to handle Files and exceptions in Python.

Week 1:

- A) Write python program to print HelloWorld.
- B) Write a python program to get string,int,float input from user.
- C) Write a python program to add 2 numbers.

Week 2:

- A) Create a list and perform the following methods
1)insert() 2)remove() 3)append() 4)len() 5)pop() 6) clear()
- B) Write a python program to find the length of list.
- C) Write a python program to find the smallest and largest number in the list.

Week 3:

- A) Create a tuple and perform the following methods
1) Add items 2) len() 3)check for item in tuple 4)Access items
- B) Write a python program using the following methods:1)count2)index
- C) Write a python program using "+" and "*" operations which resulting a new tuple.

Week 4:

- A) Create a dictionary and apply the following methods
1) Print the dictionary items 2)access items 3)use get() 4)change values 5)use len()
- B) Write a python code to convert list of tuples into dictionaries.
- C) Write python program to store data in list, tuple, set, dictionary and then try to print them.

Week 5:

- A) Write a python program to perform arithmetic, assignment, logical and comparison operators.
- B) Write a Python program to add two positive integers without using the '+' operator. (use bitwise operator)
- C) Write a Python program to perform the basic four operators(+,-,*,/).

Week 6:

- A) Write a simple python program to declare a variable in different possible ways.

- B) Write a python program to show precedence of operators using the expression:

$$z=(v+w)*x/y$$

- C) Write a python program to check whether the values of a list exist or not (use membership operator) and also perform identity operation.

Week 7:

- A) Write a python program to print a number is positive/negative using if-else.
B) Write a python program to find largest number among three numbers.
C) Write a python Program to read a number and display corresponding day using if-elif-else.
D) Write a python program to print list of numbers using range and for loop.

Week 8:

- A) Write a python code to print the sum of natural numbers using while loop.
B) Write a python program to print the factorial of given number.
C) Write a python program to find the sum of all numbers stored in a list using for loop.

Week 9:

- A) Using a numpy module create an array and check the following:
1. Type of array 2. Axes of array 3. Shape of array 4. Type of elements in array
B) Using a numpy module create array and check the following:
1. List with type float 2. 3*4 array with all zeros 3. From tuple 4. Random values

Week10:

- A) Write python program in which a function is defined and calling that function prints Hello World.
B) Write python program in which a function (with single string parameter) is defined and calling that function prints the string parameters given to function.
C) Write a python program using with any one of python function argument.

Week11:

- A) Write a program to double a given number and add two numbers using lambda().
B) Write a program for filter() to filter only even numbers from a given list.
C) Write a program for map() function to double all the items in the list?
D) Write a program to find sum of the numbers for the elements of the list by using reduce().

Week12:

- A) Write a python program to open and write "hello world" into a file.
B) Write a python program to write the content "hi python programming" for the existing file.
C) Write a python program to read the content of a file.

Week 13:

- A) Write a python program to append data to an existing file and then displaying the entire file.
B) Write a python program to open a new file, add some data into it and display the contents of that file.

Week 14:

- A) Write a python program to handle the Zero Divison Error exception.
- B) Write a python program to demonstrate multiple except block with a single try block.

TEXT BOOKS:

- 1. R.NageswaraRao, "Core Python Programming", dream tech.
- 2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", Second Edition, Updated for Python3, Shroff /O' Reilly Publishers, 2016.

COURSE OUTCOMES:

After completion of the course, Students will be able to:

- 1. Evaluate Problem solving and programming capability.
- 2. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python.
- 3. Implement conditional and loop for python programs.
- 4. Express different Decision Making statements, Arrays and Functions.
- 5. Understand and summarize different File handling operations and exceptions.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**I Year B. TECH -II- SEM****L/T/P/C****2/-/-/-****(R22A0004) ENVIRONMENTAL SCIENCE****COURSE OBJECTIVES:** On successful completion of this course, students will be able:

1. CO1: To distinguish the inter relationship between living organism and environment.
2. CO2: To categorize various types of natural resources available on the earth surface.
3. CO3: To detect the causes, and control measures of various types of environmental pollution.
4. CO4: To articulate the issues related to solid waste and its management.
5. CO5: To explain and understand the importance of Sustainable development.

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

1. CO1: Differentiate between various biotic and abiotic components of ecosystem.
2. CO2: Describe the various types of natural resources.
3. CO3: Examine the problems associated with waste management.
4. CO4: Evaluate the causes, and apply control measures of various types of environmental pollutions.
5. CO5: Develop technologies on the basis of ecological principles on environment which in turn helps in sustainable development.

UNIT-I ECOSYSTEMS (6 hours)

Definition, Scope and Importance of Ecosystem; Structure of an Ecosystem - abiotic and biotic component; Functions of an ecosystem- food chains, food webs and ecological pyramids.

Activities: Case studies, poster making, Essays on biotic components.

UNIT-II NATURAL RESOURCES (6hours)

Classification of Resources: Definition of natural resource - renewable and non -renewable resources. Forest resources - functions and uses of forests, Deforestation - causes and consequences. Water resources – Dams - benefits and environmental problems over dams. Renewable resources - solar energy (solar cells), hydro power, biogas and bio-fuel.

Activities: Case studies, seminars, Group Project works, to prepare rain water harvesting models, to demonstrate the generation of electricity with the utilization of non-conventional energy resources.

UNIT-III ENVIRONMENTAL POLLUTION AND TECHNIQUES (6 hours)

Definition, Types of pollution- Air pollution- causes, effects, control measures of air pollution and prevention techniques. Water pollution- causes, effects, control measures and techniques.

Activities: Work sheets, Debate, seminars, surrounding case studies.

UNIT-IV SOLID WASTE MANAGEMENT (5 hours)

Definition of Solid waste, characteristics of solid waste; Solid waste management- collection, transportation, processing treatment and disposal methods; e-waste management; 3R techniques- reduce, reuse and recycle.

Activities: Quiz, Puzzles, Seminars, Case studies.

UNIT-V SUSTAINABLE DEVELOPMENT (4 hours)

Definition of sustainable development, sustainable development goals, threats to sustainability, strategies to achieve sustainable development.

Activities: Worksheets, seminars, slogans, group projects.

TEXT BOOKS

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission
2. Environmental Studies by R. Rajagopalan, Oxford University Press.
3. Textbook of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications
4. Dr. P. D Sharma, "Ecology and Environment", Rastogi Publications, New Delhi, 12 Edition, 2015

REFERENCE BOOKS

1. Environmental Studies by Anubha Kaushik, 4 Edition, New age international publishers
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Pvt. Ltd, New Delhi
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHL Learning Pvt. Ltd, New Delhi
4. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA editio

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**B. TECH- II- YEAR- I-SEM****L/T/P/C
3/1/-/4****(R22A0025) Numerical Methods and Complex Variables**
(Common to ECE & EEE)**Objectives:** To learn

- Numerical methods for solving ordinary differential equations.
- The properties of Laplace Transform, Inverse Laplace Transform and Convolution theorem.
- Differentiation and integration of complex valued functions. Evaluation of integrals using Cauchy's integral formula.
- Taylor's series, and Laurent's series expansions of complex functions, evaluation of integrals using residue theorem.
- Transform a given function from z - plane to w – plane. Identify the transformations like translation, magnification, rotation, reflection, inversion, and Properties of bilinear transformations.

UNIT – I: Numerical Methods

Definition of Interpolation, Finding root by Iterative method, Solving first order ODE by Picards method, Taylors series method for solving second order ODE, Runge-Kutta method for solving second order ODE and Numerical Differentiation.

UNIT -II: Laplace Transforms

Definition of Laplace transform, domain of the function and Kernel for the Laplace transforms, Existence of Laplace transform, Laplace transform of standard functions, first shifting Theorem, Laplace transform of functions when they are multiplied or divided by "t", Laplace transforms of derivatives and integrals of functions, Unit step function, Periodic function.

Inverse Laplace transform by Partial fractions, Inverse Laplace transforms of functions when they are multiplied or divided by "s", Inverse Laplace Transforms of derivatives and integrals of functions, Convolution theorem. Solving ordinary differential equations by Laplace transforms.

UNIT – III: Analytic functions

Complex functions and its representation on Argand plane, Concepts of limit, continuity, differentiability, Analyticity, and Cauchy-Riemann conditions, Harmonic functions – Milne – Thompson method. Line integral – Evaluation along a path and by indefinite integration – Cauchy's integral theorem (singly and multiply connected regions) – Cauchy's integral formula – Generalized integral formula.

UNIT – IV: Singularities and Residues

Radius of convergence – Expansion in Taylor's series, Laurent series. Singular point – Isolated singular point – pole of order m – essential singularity. Residue – Evaluation of residue by formula and by Laurent series – Residue theorem. Evaluation of integrals of the type

$$(a) \text{ Improper real integrals } \int_{-\infty}^{\infty} f(x)dx \quad (b) \int_c^{c+2\pi} f(\cos\Theta, \sin\Theta)d\Theta$$

UNIT – V: Conformal Mappings

Conformal mapping: Transformation of z -plane to w -plane by a function, Conformal transformation. Standard transformations- Translation; Magnification and rotation; inversion and reflection, Transformations like e^z , $\log z$, z^2 , and Bilinear transformation. Properties of Bilinear transformation, determination of bilinear transformation when mappings of 3 points are given (cross ratio).

TEXT BOOKS:

- i) Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
- ii) Higher Engineering Mathematics by Ramana B.V, Tata McGraw Hill.
- iii) Complex Variables : Theory and Applications by H.S Kasana.

REFERENCES:

- i) Complex Variables by Murray Spiegel, Seymour Lipschutz, et al. by Schaum's outlines series.
- iii) Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
- iii) Advanced Engineering Mathematics by Michael Greenberg –Pearson publishers.

Course Outcomes: After going through this course the students will be able to

1. Understand the Numerical differentiation and able to solve the second order ODE by Numerical methods.
2. Solve differential equations with initial conditions using Laplace Transformation.
3. Analyze the complex functions with reference to their analyticity and integration using Cauchy's integral theorem.
4. Find the Taylor's and Laurent series expansion of complex functions and solution of improper integrals can be obtained by Cauchy's-Residue theorem.
5. Understand the conformal transformations of complex functions can be dealt with ease.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B. Tech EEE– I SEM****L/T/P/C****3/1/-/4****(R22A0202) ELECTRICAL MACHINES - I****Course Objectives:**

- To study and understand construction, operation and applications of DC generators
- To study and understand construction, operation and applications of DC Motors
- To study and understand the performance of DC machines by various testing methods
- To study and understand construction, operation of single phase transformers
- To study and understand the performance of single phase transformers by various testing methods and poly phase transformers

UNIT - I:**D.C. GENERATORS:**

Principle of operation – constructional features – armature windings – lap and wave windings – E.M.F Equation, Numerical Problems. Armature reaction - Cross magnetizing and De-magnetizing AT/pole – compensating winding – interpoles. – Types of d c generators – separately excited and self-excited generators – build-up of E.M.F in self excited generator - causes for failure to self-excite and remedial measures- critical field resistance and critical speed, Characteristics and applications of shunt, series and compound generators.

UNIT - II:**D.C MOTORS:**

Principle of operation – Significance of Back E.M.F. –Torque equation, Numerical Problems. Types of d c motors, Characteristics and Applications of shunt, series and compound motors. Speed control of D.C. Shunt Motors - Armature control and field or flux control methods. DC Motor starters - 3 point starters.

UNIT - III:**TESTING OF D.C. MACHINES:**

Losses - Constant & Variable losses – Efficiency – condition for maximum efficiency, Numerical Problems. Methods of Testing: Direct Test (Brake test), Indirect Test (Swinburne's test) and Regenerative test (Hopkinson's test) - Field's test.

UNIT-IV**SINGLE PHASE TRANSFORMERS:**

Principle of operation- constructional features- Types step-up and step down- EMF equation- Numeric problems- operation on no load and on load with phasor diagram- Equivalent circuit- condition for maximum efficiency- losses and efficiency- regulation - All day efficiency- Numerical Problems. Applications.

UNIT - V:**TESTING OF TRANSFORMERS AND POLY-PHASE TRANSFORMERS:**

Predetermination of efficiency and regulation by Open Circuit and Short Circuit tests - Sumpner's test – parallel operation with equal and unequal voltage ratios. -

Auto transformers: Working principle and equivalent circuit.

Poly-phase transformers: Poly-phase connections - Y/Y, Y/ Δ , Δ /Y, Δ / Δ , -Scott connection and Application.

TEXT BOOKS:

1. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011
2. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.

REFERENCE BOOKS:

1. Abhijith Chakrabarthi & Subitha Debnath, "Electrical Machines", Mc Graw Hill, 2015
2. A. E. Fitzgerald and C.Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013

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

- Discuss the construction and operation of DC machine
- Discuss the operation, starting and speed control of DC Motor
- Use different tests to calculate the efficiency of DC machines
- Explain the construction and operation of single phase transformers
- Calculate the efficiency and regulation of single phase transformers

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B.Tech EEE–ISEM****L/T/P/C****3/-/-3****(R22A0204) ELECTRICAL CIRCUIT ANALYSIS****COURSE OBJECTIVES:**

1. To understand and analyze the DC Circuits
2. To evaluate network parameters of given electrical network.
3. To understand the concept of DC and AC Transients.
4. To learn the various connections of 3-phase circuits and coupled circuits.
5. To study the locus diagrams of series and parallel combination of R-L-C –circuits and concept of the concept of resonance.

UNIT-I

INTRODUCTION TO ELECTRICAL CIRCUITS: Classification of Network Elements, Types of Sources, Source Transformation, Circuit Reduction Technique-Series and Parallel connection(R, L, C), Star-Delta and Delta –Star Transformation.

NETWORK THEOREMS: Reciprocity Theorem, Maximum Power Transfer Theorem, Milliman's Theorem.

UNIT-II

NETWORK PARAMETERS: Two port network parameters–Z, Y, ABCD and hybrid parameters. Condition for reciprocity and symmetry. Conversion of Z and Y parameters, Interconnection of Two port networks in series, parallel and cascaded configuration.

UNIT–III TRANSIENT ANALYSIS: Initial conditions, Transient response of R-L and R-C circuits for D.C. and A.C. excitations - Solution using differential equation method.

UNIT–IV: THREE PHASE CIRCUITS: Analysis of balanced and unbalanced 3-phase circuits, Star and delta connections, Measurement of three-phase power for balanced and unbalanced loads.

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

UNIT – V:

LOCUS DIAGRAMS & RESONANCE: Series and Parallel combination of R-L and R-C circuits with variation of various parameters. Resonance for series and parallel circuits, concept of band width and Q factor.

TEXTBOOKS:

1. William Hart Hayt, Jack Ellsworth Kemmerly, Steven M. Durbin(2007), Engineering Circuit Analysis, 7th edition, McGraw-Hill Higher Education, New Delhi, India

2. Josepha.Edminister(2002),Schaum'sout line of Electrical Circuits,4thedition, Tata Mc Graw Hill Publications, New Delhi, India.
3. A.Sudhakar,ShyammohanS.Palli(2003),ElectricalCircuits,2ndEdition,TataMcGr awHill,NewDelhi

REFERENCEBOOKS:

1. L.Wadhwa(2008),Electric Circuits Analysis,2ndedition, New Age International Publications, New Delhi.
2. A.Chakrabarty(2010),CircuitTheory,5thedition,DhanpatRai & Sons Publications, New Delhi.
3. VanValkenburg,M.E.(1974),NetworkAnalysis,3rdEdition,PrenticeHall of India,New Delhi.
4. A Text Book on Electrical Technology. – BLTHERAJA,Vol1,S.Chand Publications.

COURSEOUTCOMES:

At the end of this course the students would be able to:

1. Analyze electric circuits using network theorems.
2. Understand and evaluate the different types of two port network parameters.
3. Analyze the transient and steady-state response of electrical circuits.
4. Able to understand the concept of balanced and unbalanced loads in three phase circuits and coupled circuits.
5. Analyze the behavior of series and parallel R-L-C circuits at resonance basic concept of locus diagrams of R-L, R-C series and parallel circuits.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B. Tech EEE– I SEM****L/T/P/C****3/0/-/3****(R22A0205) POWERSYSTEM-I****Prerequisite:** Electrical Circuit Analysis.**Course Objectives:**

- To understand the power generation through conventional and non-conventional sources.
- To illustrate the economic aspects of power generation and tariff methods.
- To calculate overhead transmission line inductances and capacitances.
- To study the performance of transmission lines
- To know about DC distribution systems

UNIT-I GENERATION OF ELECTRIC POWER:

Conventional Sources Energy Sources: Layout and major components of Hydro station, Steam Power Plant, Nuclear Power Plant (Qualitative treatment only).

Non-Conventional Energy Sources: Principles of Solar, Wind and Geothermal Power Generations (Elementary treatment only).

UNIT – II ECONOMIC ASPECTS OF POWER GENERATION:

Definitions of Connected load, maximum demand, demand factor, load factor, diversity factor, Load duration curve, number and size of generator units. Base load and peak load plants.

Tariff Methods: Costs of Electrical Energy-Fixed, Semi-fixed and Running Cost. Types of Tariff: Simple, Flat Rate, Block-Rate, two-part, three –part, power factor tariff methods and Numerical Problems.

UNIT – III

OVER HEAD TRANSMISSION LINES: Line conductors, inductance and capacitance of single phase and three phase lines with symmetrical and unsymmetrical spacing, Composite conductor transposition, bundled conductors, and skin and proximity effects.

UNIT - IV: PERFORMANCE OF TRANSMISSION LINES:

Representation of lines, short transmission lines, medium length lines, nominal T and PI-representations, long transmission lines and Ferranti Effect.

CORONA: Introduction, disruptive critical voltage, corona loss, Factors affecting corona loss and methods of reducing corona loss, Disadvantages of corona.

UNIT-V: DC DISTRIBUTION:

Classification of Distribution Systems. - Comparison of DC vs.AC and Under Ground vs. Over-

Head Distribution Systems. Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

TEXT BOOKS:

1. C.L. Wadhwa, “Generation, Distribution and Utilization of Electrical Energy”, 2nd Edition, New Age International, 2009.
2. V.K Mehta and Rohit Mehta, “Principles of Power Systems”, S. Chand & Company Ltd, New Delhi, 2004.

REFERENCE BOOKS:

1. A. Chakrabarti, M.L. Soni, P.V. Gupta, U.S. Bhatnagar, “A Text book on Power System Engineering”, Dhanpat Rai Publishing Company (P) Ltd, 2008.
2. C.L. Wadhwa, “Electrical Power Systems”, 5th Edition, New Age International, 2009.
3. M.V. Deshpande, “Elements of Electrical Power Station Design”, 3rd. Edition, Wheeler Pub. 1998.
4. H.Cotton & H. Barber, “The Transmission and Distribution of Electrical Energy”, 3rd. Edition, 1970.
5. W.D.Stevenson, “Elements of Power System Analysis”, 4th Edition, McGraw Hill, 1984.

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

- Understand the operation of conventional and renewable electrical power generating stations.
- Evaluate the power tariff methods and Economics associated with power generation.
- Analyze transmission line inductance and capacitance.
- Analyze transmission line performance.
- Analyze the operations of Distribution systems.

**MALLA REDDY COLLEGE OF ENGINEERING AND
TECHNOLOGY****II YEAR B.Tech EEE– I SEM****L/T/P/C****3/-/3****(R22A0207) ELECTRO MAGNETIC FIELDS****COURSE OBJECTIVES:**

1. To introduce the concepts of electric field, magnetic field.
2. To Analyze Maxwell's equation in different forms in Electrostatic, Magnetic time varying fields.
3. To solve the problems in different EM fields.
4. To analyze moving charges in Magnetic fields.
5. To understand electric and magnetic fields in the development of theory for electrical machines.

UNIT – I

ELECTROSTATICS: Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Potential gradient – Gauss's law– Application of Gauss's Law – Maxwell's first law, $\text{div}(\mathbf{D}) = \rho_v$ – Laplace's and Poisson's equations.

UNIT – II

DIELECTRICS & CAPACITANCE: Behavior of conductors in an electric field – Conductors and Insulators – Dielectric boundary conditions – Capacitance – Capacitance of parallel plates– spherical co-axial capacitors— Current density – conduction and Convection current densities -Ohm's law in point form – Equation of continuity

UNIT – III

MAGNETO STATICS: Static magnetic fields – Biot-Savart's law – Magnetic field intensity (MFI)– MFI due to a straight current carrying filament – MFI due to circular, current Carrying wire – Relation between magnetic flux and magnetic flux density –Maxwell's second Equation, $\text{div}(\mathbf{B})=0$, Ampere's circuital law and its applications – Point form of Ampere's circuital law - Maxwell's third equation, $\text{Curl}(\mathbf{H})=\mathbf{J}_c$

UNIT – IV

FORCE IN MAGNETIC FIELDS: Magnetic force Moving charges in magnetic field – Lorentz force equation – Self and Mutual inductance – determination of self-inductance of a solenoid and toroid – energy stored and density in a magnetic field.

UNIT – V

TIME VARYING FIELDS: Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation, $\text{Curl}(\mathbf{E})=-\frac{d\mathbf{B}}{dt}$ – Statically and

Dynamically induced EMFs – Simple problems -Modification of Maxwell's equations for time varying fields – Displacement current.

TEXT BOOKS:

1. "William H. Hayt & John. A. Buck", "Engineering Electromagnetic" ,Mc.

Graw- HillCompanies, 7thEdition,2009.

2. “Sadiku”, “Electromagnetic Fields”, Oxford Publications, 4th Edition,2009.

REFERENCE BOOKS:

1. “CR Pauland S.A. Nasar”, “Introduction to Electromagnetic”, Mc Graw Hill Publications,3rd Edition, 1997.
2. “Nathan Ida”, “Engineering Electromagnetic”, Springer (India) Pvt. Ltd. 2nd Edition,2015.
3. “D J Griffiths”, “Introduction to Electro Dynamics”, Prentice-Hall of India Pvt.Ltd,3rdedition, 1999.
4. “J.DKraus”, “Electro magnetics”,McGraw-HillInc. 4th edition, 1992.

COURSE OUTCOMES:

At the end of this course the students would be able to:

1. To understand the basic laws of electro magnetism.
2. To obtain the electric and magnetic fields for simple configurations under static conditions.
3. To analyze time varying electric and magnetic fields.
4. To understand Maxwell’s equation in different forms and different media.
5. To understand the Faraday’s law of Electromagnetic induction.

**MALLA REDDY COLLEGE OF ENGINEERING
AND TECHNOLOGY**

II YEAR B. Tech EEE– I SEM

L/T/P/C

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(R22A0282) Electrical Machines Laboratory-I

Course Objectives:

- To conduct various tests on different D C Generators
- To conduct various tests on different D C Motors
- To perform different tests on Single and Three Phase Transformers

The following experiments are required to be conducted **compulsory** experiments:

- 1 Magnetization characteristics of DC shunt generator (Determination of critical field resistance and critical speed)
- 2 Load test on DC shunt generator (Determination of characteristics)
- 3 Load test on DC series generator (Determination of characteristics)
- 4 Hopkinson's test on two identical DC shunt machines (Predetermination of efficiency)
- 5 Swinburne's test on DC Machine (Predetermination of efficiencies)
- 6 Speed control of DC shunt motor using Armature control and Field control Methods
- 7 Brake test on DC shunt motor (Determination of performance curves)
- 8 OC and SC Tests on Single Phase Transformer

In addition to the above eight experiments, **at least any two** of the experiments from the following list are required to be conducted:

1. Load test on DC compound generator (Determination of characteristics)
2. Field's test on two identical DC series machines (Determination of efficiency)
3. Brake test on DC compound motor (determination of efficiency)
4. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)
5. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer.

TEXT BOOKS:

1. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011
2. I.J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.

REFERENCE BOOKS:

1. PrithwirajPurkait, Indrayudh Bandyopadhyay, "Electrical Machines", Oxford, 2017.
2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.
3. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013.
4. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2004.

Course Outcomes: At the end of this course, students will demonstrate the ability to

- Determine the characteristics of different d c generators using different testing methods.
- Determine the performance of different d c motors using different testing methods.
- Calculate Efficiency and Regulation of different Transformers using different testing methods

**MALLA REDDY COLLEGE OF ENGINEERING AND
TECHNOLOGY****II YEAR B. Tech EEE– I SEM****L/T/P/C
-/-/2/1****(R22A0284) ELECTRICAL CIRCUITS ANALYSIS LAB****COURSE OBJECTIVES:**

1. To learn the various connections of 3-phase circuits.
2. To understand the concept of resonance and Locus Diagrams of RL and RC Series Circuit
3. To study the Z and Y Parameters of two Port networks.
4. To study and understand the Transmission (ABCD) and Hybrid parameters of given electrical network.

The following experiments are required to be conducted as compulsory

- 1) Millman's Theorem
- 2) Maximum power transformation Theorem
- 3) Series and Parallel Resonance
- 4) Determination of Two port network parameters - Z and Y Parameters
- 5) Determination of Two port network parameters -Transmission (ABCD) parameters.
- 6) Measurement of Active Power for Star and Delta connected balanced loads
- 7) Measurement of Reactive Power for Star and Delta connected balanced loads
- 8) Reciprocity Theorem

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted

1. Determination of Two port network parameters -Hybrid parameters.
2. Locus Diagrams of RL(R-varying) and RC(R-varying) Series Circuits
3. Determination of Co-efficient of Coupling and Separation of Self and Mutual inductance in a Coupled Circuits
4. Determination of Time response of first order RL & RC circuit for periodic sinusoidal inputs – Time Constant and Steady state error.

TEXTBOOKS:

1. William Hart Hayt, Jack Ellsworth Kemmerly, Steven M. Durbin(2007), Engineering Circuit Analysis, 7th edition, McGraw-Hill Higher Education, New Delhi, India
2. Joseph A. Edminister(2002), Schaum's outline of Electrical Circuits, 4th edition, Tata Mc Graw Hill Publications, New Delhi, India.
3. A. Sudhakar, Shyam Mohan S. Palli(2003), Electrical Circuits, 2nd Edition, Tata McGraw Hill, New Delhi

REFERENCE BOOKS:

1. L. Wadhwa(2008), Electric Circuits Analysis, 2nd edition, New Age International Publications,

New Delhi.

2. A.Chakrabarty(2010),CircuitTheory,5thedition,DhanpatRai & Sons Publications, New Delhi.
3. VanValkenburg,M.E.(1974),NetworkAnalysis,3rdEdition,PrenticeHall of India,New Delhi.
4. A Text Book on Electrical Technology. – BL THERAJA, Vol1, S. Chand Publications.

COURSE OUTCOMES:

At the end of this course the students would be able to:

1. Analyze a given network by applying millman's Theorem.
2. Explain the basics of Series and Parallel Resonance.
3. To study the Transmission (ABCD) and Hybrid parameters of two port networks.
4. Explain clearly the calculations of three phase Active and Reactive power for Star and Delta connected balanced load.
5. Apply concepts of electrical circuits across engineering.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B. Tech EEE– I SEM****L/T/P/C
-/-/2/1****(R22A0285) ELECTRICAL SIMULATION TOOLS LABORATORY****Course Objectives:**

- To understand basic block sets of different simulation platform used in electrical/electronic circuit design.
- To understand use and coding in different software tools used in electrical/electronic circuit design.
- To understand the simulation of electric machines/circuits for performance analysis.

Any ten experiments need to be performed from the following experiments from various subject domains

- 1 Introduction to basic matrix operations.
- 2 Generation of standard test signals using suitable simulation tools.
- 3 Measurement of Voltage, Current and Power in DC circuits.
- 4 Verification of different network theorems Thevenin's & Norton's with independent sources using suitable simulation tools.
- 5 Verification of performance characteristics of basic Electronic Devices using suitable simulation tools.
- 6 Analysis of series and parallel resonance circuits using suitable simulation tools
- 7 Obtain the response of R-L circuit with standard test signals using suitable simulation tools.
- 8 Modeling and Analysis of Low pass and High pass Filters using suitable simulation tools
- 9 Performance analysis of DC motor using suitable simulation tools
- 10 Modeling of transformer using suitable simulation tools.
- 11 Analysis of single-phase bridge rectifier with and without filter using suitable Simulation tools.
- 12 Modeling and Verification of Voltage Regulator using suitable simulation tools.
- 13 Modeling of transmission line using simulation tools.
- 14 Performance analysis of Solar PV model using suitable simulation tools

TEXT BOOKS:

1. M. H. Rashid, Simulation of Electric and Electronic circuits using PSPICE – by M/s PHI Publications.
2. Agam Kumar Tyagi, “MATLAB and SIMULINK for Engineers” OUP Publisher, 2012.
3. M. Gopal, “Control Systems: Principles and Design”, McGraw Hill Education, 1997.
4. C. K. Alexander and M. N. O. Sadiku, “Electric Circuits”, McGraw Hill Education, 2004.

REFERENCE BOOKS:

1. Reference guides of related software's
2. Rashid, Spice for power electronics and electric power, CRC Press

Course Outcomes: At the end of this course, students will demonstrate the ability to

- Develop knowledge of software packages to model and program electrical and electronics systems.
- Model different electrical and electronic systems and analyze the results.
- Articulate importance of software packages used for simulation in laboratory experimentation by analyzing the simulation results.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II Year B.Tech. EEE- I Sem****L/T/P/C****2/0/0/0****(R22A0005) FOREIGN LANGUAGE-FRENCH****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

1. To inculcate the basic knowledge of the French language
2. To hone the basic sentence constructions in day to day expressions for communication in their vocation
3. To form simple sentences that aids in day-to-day communication
4. To prepare the students towards DELF A1
5. To develop in the student an interest towards learning languages.

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– The –ir verbs in the present- The verbs do, go, take, come,- Adverbs-Reflexive verbs

Vocabulary: The days and months of the year- The sports-Hobbies

UNIT - IV

Speaking: Express the quantity - ask and give the price - express the need, the will and the capacity - compare (adjective) - speak at the restaurant / in the shops

Writing: A dialogue between a vendor and a customer at the market

Grammar: Verbs "to want", "to can"- Express capacity / possibility- Express will / desire – the future tense

Vocabulary: The food – Meals-Fruits and vegetables– The parts of the body

UNIT - V

Speaking: Express the prohibition and the obligation - describe an apartment - talk about the weather / ask the weather - ask the opinion - give your opinion - express your agreement or disagreement

Writing: Descriptions

Grammar: Demonstrative adjectives- Prepositions- The verb 'must' to indicate obligation and necessity in the present

Vocabulary: Seasons – Holidays-The city– Furniture

NOTE: The students are exposed to simple listening and reading activities.

REFERENCE BOOKS

1. Apprenons le Français 1& 2, New Saraswati House, 2015
2. A propos, A1, Langers International, 2010
3. Easy French Step-by-step by Myrna Bell Rochester
4. Ultimate French Beginner-Intermediate (Coursebook) By Livid Language
5. À L'Aventure: An Introduction to French Language and Francophone Cultures by Evelyne Charvier-Berman, Anne C. Cummings.

COURSE OUTCOMES

1. The students will be able to communicate in French at A1 level.
2. The student will have an advantage in the competitive job market.
3. This course benefits the graduates when pursuing study *opportunities* in the countries where French is the official language

II- II

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. TECH - II- SEM

L/T/P/C

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(R22A0353) SOLID MECHANICS AND HYDRAULIC MACHINES**Course Objectives:**

- To identify an appropriate structural system and work comfortably with basic engineering mechanics.
- To Understand the meaning of centers of gravity, centroids, moments of Inertia and rigidbody dynamics.
- Study and develop basic understanding of important mechanisms, drives and materials used in the engineering and consumer industry in conjunction with other electrical
- To Study the characteristics of hydroelectric power plant and Design of hydraulic machinery
- To understand the working principle of different types turbines, pumps and motors that work on the principle of hydraulic

UNIT-I:

INTRODUCTION OF ENGINEERING MECHANICS: Basic concepts of System of Forces-Coplanar Forces-Components in Space-Resultant- Moment of Forces and its Application – Couples and Resultant of Force System-Equilibrium of System of Forces-Free body diagrams- Support reactions different beams for different types of loading – concentrated & uniformly distributed.

UNIT-II:

CENTROID AND CENTER OF GRAVITY: Centroids – Theorem of Pappus- Centre of Gravity of Bodies – Area moment of Inertia: –polar Moment of Inertia.

SIMPLE STRESSES AND STRAINS ANALYSIS: Concept of stress and strain- St. Venant's Principle-Stress and Strain Diagram - Elasticity and plasticity – Types of stresses and strains-Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain.

UNIT-III:

Power Transmitting Devices: Belts and belt drives and simple mechanisms, Rope drive, Gears & gear trains;

Friction -Types of friction,Friction clutch (cone and single plate). Brakes and bearings (types and applications only); Applications of these devices..

UNIT-IV:

BASICS OF HYDRAULIC MACHINERY: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, Jet striking centrally and at tip, Velocity triangles at

inlet and outlet, expressions for work done and efficiency Elements of a typical Hydropower installation – Heads and efficiencies

UNIT-V:

TURBINES & PUMPS: Classification of turbines – Pelton wheel – Francis turbine – Kaplan turbine –working , velocity diagram, work done and efficiency, hydraulic design. Draft tube – Classification, functions and efficiency.
Pump installation details – classification – work done –losses and efficiencies – specific speed. Multistage pumps – pumps in parallel

TEXT BOOKS:

1. M.V. Seshagirirao and Durgaih, “Engineering Mechanics”,University Press.
2. P.N Modi and Seth, “Fluid Mechanics and Hydraulic Machinery”, standard Book House.

REFERENCE BOOKS:

1. B. Bhattacharya, “Engineering Mechanics”, Oxford University Publications.
2. Hibbler, “Engineering Mechanics (Statics and Dynamics)”, Pearson Education.
3. Fedrinand L. Singer, “Engineering Mechanics” Harper Collings Publishers.
4. A.K.Tayal, “Engineering Mechanics”, Umesh Publication.
5. Domkundwar & Domkundwar, “Fluid mechanics & Hydraulic Machines”, Dhanpat Rai & C
6. R.C.Hibbeler, “Fluid Mechanics”, Pearson India Education Servicees Pvt. Ltd
7. D.S.Kumar, “Fluid Mechanic & Fluid Power Engineering”, Kataria & Sons Publications Pvt. Ltd.
8. Banga & Sharma, “Hydraulic Machines” Khanna Publishers.

Course Outcomes:

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

- Solve problems dealing with forces, beam and understand distributed force systems.
- Solve friction problems and determine moments of Inertia and centroid of practical shapes.
- Understand the inter dependence of the thrust areas in Mechanical Engineering with other core engineering subjects in today’s engineering Industry.
- Be conversant with all basic mechanisms, drives, brakes, bearings etc that are essential parts in today’s engineering products and consumer systems
- Apply knowledge of mechanics in addressing problems in hydraulic machinery and its principles that will be utilized in Hydropower development and for other practical usages

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B.Tech EEE–I SEM****L/T/P/C****3/-/-/3****(R22A0208) MEASUREMENTS AND INSTRUMENTATION****Prerequisites** Electrical Circuit Analysis, Analog Electronics, Electro Magnetic Fields.**Course Objectives:**

- To impart knowledge on Construction, basic principles of all measuring instruments
- To impart knowledge on working principles of Potentiometers and Instrument transformers
- To acquire knowledge on Wattmeter and Energy meter.
- To study different bridge circuits for finding R LC parameters.
- To understand the basic concepts of smart and digital metering

UNIT - I:

INTRODUCTION TO MEASURING INSTRUMENTS: Classification – deflecting, control and damping torques ,PMMC expression for the deflecting torque and control torque – Errors and compensations, moving iron type instruments – expression for the deflecting torque and control torque – Errors and compensations, extension of Ammeters using only single shunts resistance and extension of Voltmeters using only single series resistance and simple problems. Quadrant type Electrostatic Voltmeter- expression for the deflecting torque and control torque.

UNIT - II:

POTENTIOMETERS & INSTRUMENT TRANSFORMERS: Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage. A.C. Potentiometers: polar and coordinate type's standardization – applications, CT and PT – Ratio

UNIT - III:

MEASUREMENT OF POWER & ENERGY: Single phase dynamometer wattmeter, expression for deflecting and control torques, single power factor meter, Single phase induction type energy meter – driving and braking torques – errors and compensations, phantom loading test , Measurement of active and reactive powers in balanced

UNIT - IV:

DC & AC BRIDGES: resistance measuring of low resistance by using Kelvin's double bridge , resistance measuring of medium resistance by using Whetstone's bridge– measurement of high resistance – megger, loss of charge method. Measurement of inductance- Maxwell's bridge, Hay's bridge, Anderson's bridge . Measurement of capacitance –Desauty Bridge -, Schering Bridge. Measurement of frequency -Wien's bridge.

UNIT - V:

TRANSDUCERS: Definition of transducers, Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers; Principle operation of LVDT and LVDT Applications, Capacitance pressure transducer, definition of Strain gauge and Strain Gauge Factor Derivation

TEXT BOOKS:

1. A. K. Sawhney, "Electrical & Electronic Measurement & Instruments", Dhanpat Rai & Co. Publications, 2005.
2. Dr. Rajendra Prasad, "Electrical Measurements & Measuring Instruments", Khanna Publishers 1989.

REFERENCE BOOKS:

1. G. K. Banerjee, "Electrical and Electronic Measurements", PHI Learning Pvt. Ltd., 2nd Edition, 2016.
2. R. K. Rajput, "Electrical & Electronic Measurement & Instrumentation", S. Chand and Company Ltd., 2007
3. E. W. Golding and F. C. Widdis, "Electrical Measurements and measuring Instruments", fifth Edition, Wheeler Publishing, 2011.
4. Reissland, M. U, "Electrical Measurements: Fundamentals, Concepts, Applications", New Age International (P) Limited Publishers, 1st Edition 2010.

Course Outcomes: At the end of this course, students will

- demonstrate the ability to Classify measuring instruments and discuss their construction, operation and characteristics.
- Discuss the Potentiometers and Instrument Transformers.
- Demonstrate the working principles of wattmeter and Energy meter.
- Calculate all circuit parameters.
- Classify Transducers and discuss the concepts of smart and digital metering

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B. Tech EEE– II SEM****L/T/P/C****3/0/-/3****(R22A0203) ELECTRICAL MACHINES-II****Pre requisites:** Electrical Circuit Analysis & Electrical Machines-I**Course Objectives:**

- To impart knowledge on Construction, principle of operation of three phase induction motors.
- To impart knowledge on the performance, Starting and speed control of three phase induction motors.
- To acquire knowledge on the Alternators.
- To study the concept of parallel operation of alternators and synchronous motors
- To understand operation, construction and types of single-phase motors and their applications in household appliances.

UNIT - I:

THREE PHASE INDUCTION MOTOR: Constructional details of squirrel cage and slip ring(wound rotor) motors, production of a rotating magnetic field, principle of operation - rotor EMF and rotor frequency – rotor reactance, rotor current and Power factor at standstill and during operation. Rotor power input, rotor copper loss and mechanical power developed. and their inter relation.

UNIT - II:

CHARACTERISTICS OF THREE PHASE INDUCTION MOTOR: Torque equation- expressions for maximum torque and starting torque - torque slip characteristic - equivalent circuit - phasor diagram - No-load Test and Blocked rotor test – Predetermination of performance. Applications. Induction generator-principle of Operation

STARTING AND SPEED CONTROL METHODS: Methods of starting, Methods of speed control Change of voltage, change of frequency, voltage/frequency, and injection of an EMF into rotor circuit (qualitative treatment only).

UNIT - III:

SYNCHRONOUS GENERATOR: Constructional Features of Cylindrical (round) rotor and salient pole machines –Armature windings – Integral slot and fractional slot windings, Distributed and concentrated windings –distribution, pitch and winding factors – E.M.F Equation.– armature reaction - leakage reactance – synchronous reactance and impedance – experimental determination - phasor diagram – load characteristics. Regulation by synchronous impedance method, M.M.F. method and Z.P.F. method.

UNIT - IV:

PARALLEL OPERATION OF SYNCHRONOUS GENERATORS: Synchronizing alternators with infinite bus bars – synchronizing power torque – parallel operation and load sharing - Effect of change of excitation and mechanical power input.

SYNCHRONOUS MOTORS: Theory of operation – phasor diagram – Variation of current and power factor with excitation – synchronous condenser – Hunting and its suppression – Methods of starting.

UNIT - V:

SINGLE PHASE MOTORS: Single phase induction motor – Constructional Features- Double revolving field theory – split-phase motors – Shaded pole motor- AC series motor- Universal Motor- Applications--Stepper Motor-Brushless DC motor.

TEXT BOOKS:

1. P. S. Bimbhra, “Electrical Machinery”, Khanna Publishers, 2011.
2. I.J. Nagrath and D. P. Kothari, “Electric Machines”, McGraw Hill Education, 2010

REFERENCE BOOKS:

1. Prithwiraj Purkait, Indrayudh Bandyopadhyay, “Electrical Machines”, Oxford, 2017.
2. M. G. Say, “Performance and design of AC machines”, CBS Publishers, 2002
3. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013
4. A. E. Clayton and N. N. Hancock, “Performance and design of DC machines”, CBS Publishers, 2004.

Course Outcomes: At the end of this course students will demonstrate the ability to

- Discuss the Construction and the principle of operation of three phase induction motors.
- Determine the performance and discuss the methods of Starting and speed control of three phase induction motors.
- Calculate the voltage regulation of different alternators by using different methods.
- Discuss the concept of parallel operation of alternators and describe the synchronous motors
- Classify various types of single-phase motors.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech EEE-I Sem

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(R22A0471) ANALOG & DIGITAL ELECTRONICS**Course objectives**

The main objectives of the course are:

1. Learn the concepts of load line analysis and biasing techniques
2. Learn the concepts of small signal analysis of BJT and FET
3. To understand basic number systems codes and logical gates.
4. To introduce the methods for simplifying Boolean expressions
5. To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits

UNIT-I

BJT Biasing: Transistor Biasing and Stabilization - Operating point, DC & AC load lines, Biasing - Fixed Bias, Self-Bias, Bias Stability, Bias Compensation using Diode and Transistor amplifying action.

Signal Low Frequency BJT Amplifiers: Transistor Hybrid model, Determination of h-parameters from transistor characteristics, Typical values of h- parameters in CE, CB and CC configurations, Analysis of CE, CC, CB Amplifiers and CE Amplifier with emitter resistance, low frequency response of BJT Amplifiers.

UNIT-II

Transistor at High Frequency: Hybrid π model of Common Emitter transistor model and derivation of Hybrid π model elements.

FET Amplifiers: Analysis of Common Source and Common Drain JFET Amplifiers, Comparison of performance with BJT Amplifiers

UNIT-III

Number System and Boolean Algebra: Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal, Unit Distance Code, Digital Logic Gates (AND, NAND, OR, NOR, EX-OR, EX-NOR), Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

UNIT-IV**Minimization Techniques:**

The Karnaugh Map Method, Three, Four and Five Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Multilevel NAND/NOR realizations.

UNIT-V**Combinational Circuits:**

Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Multiplexer/Demultiplexer, decoder, encoder, Code converters, Magnitude Comparator.

Sequential circuits:

Latches, Flip-Flops-SR, JK, D, T and master slave, characteristic tables and equation.

TEXT BOOKS:

1. "Electronic Devices & Circuits", Special Edition – MRCET, McGraw Hill Publications, 2017.
2. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGraw Hill.
3. Electronic Devices and Circuits, S.Salivahanan,N.Suresh kumar, McGraw Hill.
4. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 /Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
5. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.

REFERENCE BOOKS:

1. Electronic Devices and Circuits,K.Lal Kishore B.S Publications
2. Electronic Devices and Circuits, G.S.N. Raju, I.K. International Publications, New Delhi, 2006.
3. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
4. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
5. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.

OUTCOMES:

After completion of the course, the student will be able to:

1. Design the amplifiers with various biasing techniques
2. Design single stage amplifiers using BJT and FET
3. Understand the basic postulates of Boolean algebra and shows the correlation between Boolean expressions
4. Learn the methods for simplifying Boolean expressions
5. Understand the formal procedures for the analysis and design of combinational circuits and sequential circuits

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B. Tech EEE– I SEM****L/T/P/C****3/0/-/3****(R22A0206) POWERSYSTEM-II****Pre requisite:** Power system-1 & Electromagnetic Fields**Course Objectives:**

- To know about DC distribution systems
- To understand the concept of voltage control.
- To understand the per unit representation of power systems.
- To know the Symmetrical components and fault calculation analysis.
- To know about Over head insulators & Substations.

UNIT-I: A.C. DISTRIBUTION: Introduction, AC distribution, Single phase, 3-phase, 3 phase 4 wire system, bus bar arrangement. Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

UNIT-II: VOLTAGE CONTROL & POWER FACTOR IMPROVEMENT: Introduction – methods of voltage control, shunt and series capacitors / Inductors, tap changing transformers, synchronous phase modifiers, power factor improvement methods.

UNIT-III: PER UNIT REPRESENTATION & COMPENSATION OF POWER SYSTEMS: The one-line diagram, impedance and reactance diagrams, per unit quantities, changing the base of per unit quantities, advantages of per unit system.

COMPENSATION IN POWER SYSTEMS: Introduction - Concepts of Load compensation – Uncompensated transmission line – Symmetrical line – Radial line with asynchronous load – Compensation of lines.

UNIT-IV: SYMMETRICAL COMPONENTS AND FAULT CALCULATIONS: Significance of positive, negative and zero sequence components, Average 3-phase power in terms of symmetrical components, sequence impedances and sequence networks, fault calculations, sequence network equations, single line to ground fault, line to line fault, double line to ground fault, three phase fault, faults on power systems, faults with fault impedance.

UNIT-V: OVERHEAD LINE INSULATORS & SUBSTATIONS:

Introduction, types of insulators, Potential distribution over a string of suspension insulators, Methods of equalizing the potential, sag and tension calculations.

Substations: Indoor & Outdoor substations, Substations layout showing the location of all the substation equipment. Bus bar arrangements in the Sub-Stations.

TEXT BOOKS:

1. C.L. Wadhwa, “Electrical Power Systems”, New Age International Pub. Co, Third Edition, 2001.
2. D.P. Kothari and I.J. Nagrath, “Modern Power System Analysis”, Tata Mc Graw Hill Pub. Co., New Delhi, Fourth edition, 2011.

REFERENCE BOOKS:

1. A. Chakrabarti, M.L. Soni, P.V. Gupta, U.S. Bhatnagar, "A Text book on Power System Engineering", Dhanpat Rai Publishing Company (P) Ltd, 2008.
2. John J. Grainger & W.D. Stevenson, "Power System Analysis", Mc Graw Hill International, 1994.
3. Hadi Scadat, "Power System Analysis", Tata Mc Graw Hill Pub. Co. 2002. 4. W.D. Stevenson, "Elements of Power system Analysis", McGraw Hill International Student Edition.

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

- Analyze the operations of AC Distribution systems.
- Understand the application of per unit quantities in power systems.
- Apply load compensation techniques to control reactive power.
- Determine the fault currents for symmetrical and unbalanced fault
- Analyze the operations of Insulators and substations.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II YEAR B. Tech EEE– I SEM****L/T/P/C****-/-/2/1****(R22A0286) MEASUREMENTS AND INSTRUMENTATION LABORATORY****COURSE OBJECTIVES:**

The objectives of the course are to make the students learn about:

- To calibrate LPF Watt Meter, energy meter, P.F Meter using electro dynamo metertype instrument as the standard instrument.
- To determine unknown inductance, resistance, capacitance by performing experiments on D.C Bridges & A.C Bridges.
- To determine three phase active & reactive powers using single wattmeter method practically. Measurement of parameters of choke coil
- To determine the ratio and phase angle errors of current transformer and potential transformer.
- Measuring earth resistance, dielectric strength of transformer oil & Testing of underground cables

The following experiments are required to be conducted as compulsory

1. Calibration and Testing of single phase energy Meter
2. Measurement of low resistances by Kelvin's double Bridge
3. Measurement of capacitance by Schering Bridge
4. Measurement of inductance by Anderson Bridge
5. Measurement of parameters of a choke coil using 3 voltmeter and 3 ammeter methods.
6. Calibration of LPF wattmeter by Phantom testing
7. Calibration of dynamometer type power factor meter
8. Measurement of reactive power using single wattmeter in three-phase circuit

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted

1. Measurement of voltage, current and resistance using DC potentiometer
2. Measurement of load with the help of strain gauges
3. Measurement of voltage, frequency & phase with the help of CRO
4. Dielectric testing of transformer oil
5. Measurement of Displacement with the help LVDT

TEXT BOOKS:

1. A. K. Sawhney, "Electrical & Electronic Measurement & Instruments", Dhanpat Rai & Co. Publications, 2005.
2. Dr. Rajendra Prasad, "Electrical Measurements & Measuring Instruments", Khanna Publishers 1989.

REFERENCE BOOKS:

- 1.G. K. Banerjee, “Electrical and Electronic Measurements”, PHI Learning Pvt. Ltd., 2nd Edition, 2016.
- 2.R. K. Rajput, “Electrical & Electronic Measurement & Instrumentation”, S. Chand and Company Ltd., 2007
- 3.E.W. Golding and F. C. Widdis, “Electrical Measurements and measuring Instruments”, fifth Edition, Wheeler Publishing, 2011.
4. Reissland, M. U, “Electrical Measurements: Fundamentals, Concepts, Applications”, New Age International (P) Limited Publishers, 1st Edition 2010.

COURSE OUTCOMES:

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

- Calibrate various electrical measuring/recording instruments. Get the ability to choose instruments and can test any instrument can find the accuracy of any instrument by performing experiment can calibrate PMMC instrument using D.C potentiometer.
- Accurately determine the values of inductance and capacitance using a.c bridges Accurately determine the values of very low resistances
- Measure reactive power in 3-phase circuit using single wattmeter
- Determine ratio error and phase angle error of CT
- Students should be able to test current transformers and dielectric strength of oil. Students should be able to calibrate LVDT and resistance strain gauge.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II YEAR B. Tech EEE– II SEM

L/T/P/C

0/0/2/1

(R22A0283) ELECTRICAL MACHINES LABORATORY-II

Prerequisite: Electrical Machine-I and Electrical Machines-II**Course Objectives:**

- To perform different tests on different Transformers
- To conduct various tests on different Induction motors
- To conduct various tests on different Synchronous Machines

The following experiments are required to be conducted **compulsory** experiments:

- 1 Sumpner's test on a pair of single-phase transformers
- 2 Equivalent Circuit of a single-phase induction motor
- 3 No-load & Blocked rotor tests on three phase Induction motor
- 4 Regulation of a three –phase alternator by synchronous impedance
- 5 Regulation of a three –phase alternator by m.m.f. methods
- 6 Load test on three phase Induction Motor
- 7 Determination of X_d and X_q of a salient pole synchronous machine
- 8 'V' and 'Inverted V' curves of a three—phase synchronous motor

In addition to the above eight experiments, **at least any two** of the experiments from the following list are required to be conducted:

- 1 Scott Connection of transformer.
- 2 Parallel operation of Single-phase Transformers.
- 3 Regulation of three-phase alternator by Z.P.F..
- 4 Measurement of sequence impedance of a three-phase alternator.
- 5 Efficiency of a three-phase alternator.

TEXT BOOKS:

1. P. S. Bimbhra, “Electrical Machinery”, Khanna Publishers, 2011
2. I.J. Nagrath and D. P. Kothari, “Electric Machines”, McGraw Hill Education, 2010.

REFERENCE BOOKS:

1. Prithwiraj Purkait, Indrayudh Bandyopadhyay, “Electrical Machines”, Oxford, 2017.
2. M. G. Say, “Performance and design of AC machines”, CBS Publishers, 2002.
3. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013.
4. A. E. Clayton and N. N. Hancock, “Performance and design of DC machines”, CBS Publishers, 2004.

Course Outcomes: At the end of this course, students will demonstrate the ability to

- Determine the Performance of different Transformers using different testing methods.
- Determine the performance of different Induction motors using different testing methods.
- Calculate the Regulation and performance of synchronous machines using different testing methods

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**II Year B.Tech. EEE- II Sem****L/T/P/C****2/-/-/-****(R22A0061) PUBLIC POLICY & GOVERNANCE****Course objectives:**

1. To make the students understand in-depth analysis of public policy and to solve its ills prevailing in the society.
2. To provide an opportunity for the students to learn the basic areas of public policy analysis, implementation and evaluation.
3. To make understand the process and various approaches in public policy making.
4. To understand the theories and issues of social coordination and the nature of all patterns of rule.
5. To make the students understand the techniques of governance and emerging trends in public and private governance its policy-making and implementation.

Unit-I

Introduction of Public Policy: Definition, Nature, Scope and Importance of Public Policy, Evolution of Public Policy and Policy Sciences, Public Policy and Public Administration. **Approaches to Public Policy Analysis:** The Process Approach, The Logical Positivist Approach, The Phenomenological Approach, The Participatory Approach and Normative Approach

Unit-II

Theories and Process of Public Policy Making: Theories and Models of Policy Making, Perspectives of Policy Making Process, Institutions of Policy Making.

Unit-III

Policy Implementation and Evaluation: Concept of Policy Implementation, Techniques of Policy Implementation, Concept of Policy Evaluation, Constraints of Public Policy Evaluation

Unit-IV

Introduction of Governance: Definitions, Issues and Controversies, Reinventing Government, Reforming Institutions: The State, Market and Public domain. **State and Governance:** Origin and types of State, Democratic State and Democratic Administration, Neo-Liberalism and Rolling Back State and Governance as Government.

Unit-V

Citizen and Techniques of Governance: Rule of Law and Human Rights, Accountability, Participation, Representation. **Techniques of Governance:** Openness and Transparency, Citizen Charter, Social Audit. **Emerging Trends in Public and Private Governance:** An Overview, Market, Civil Society, Information and Communication Technology.

TEXT AND REFERENCE BOOKS:

1. Introduction to Public Policy- Charles Wheelan, Naked Economics 2010.
2. Birkland Thomas A., (2005), An Introduction to The Policy Process: Theories, Concepts, And Models of Public Policy Making, Armonk; M.E. Sharpe.
3. Anderson J.E., (2006) Public Policy-Making: An Introduction, Boston, Houghton
4. Bardach, Eugene (1977), The Implementation Game: What Happens After a Bill Becomes a Law, Cambridge, MA: MIT.
5. Bell, S., and Hind moor, A. (2009) Rethinking Governance: The Centrality of the State in Modern Society, Cambridge: Cambridge University Bell, Stephen and Andrew Hind moor.
6. Joyee M. Mitchell & William C. Mitchell, Political Analysis & Public Policy: An Introduction to Political Science, Thomson Press Limited, New Delhi, 1972.
7. R.K. Sapru, Public Policy, Art and Craft of policy Analysis, PHI learning private limited, New Delhi, 2011.
8. Brian W. Hogwood & Lewis A. Gunn, Policy Analysis for the Real world, Oxford University, Press, 1986.

COURSE OUTCOMES

After completion of the course, student will be able to

1. Understand public policy analysis and they will be able to understand policy evaluation and implementation.
2. Understand the public policy and governance on the largest gamut of its canvas.
3. Students will understand the what are emerging trends in public and private governance and various theories in public policy making

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

II Year B.Tech EEE-II Sem

L	T/P/D	C
3	-/-/-	3

(R22A0461) ANALOG & DIGITAL ELECTRONICS**OBJECTIVES**

The main objectives of the course are:

1. Learn the concepts of load line analysis and biasing techniques
2. Learn the concepts of small signal analysis of BJT and FET
3. To understand basic number systems codes and logical gates.
4. To introduce the methods for simplifying Boolean expressions
5. To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits

UNIT-I

BJT Biasing: Transistor Biasing and Stabilization - Operating point, DC & AC load lines, Biasing - Fixed Bias, Self-Bias, Bias Stability, Bias Compensation using Diode and Transistor amplifying action.

Signal Low Frequency BJT Amplifiers: Transistor Hybrid model, Determination of h-parameters from transistor characteristics, Typical values of h- parameters in CE, CB and CC configurations, Analysis of CE, CC, CB Amplifiers and CE Amplifier with emitter resistance, low frequency response of BJT Amplifiers.

UNIT-II

Transistor at High Frequency: Hybrid π model of Common Emitter transistor model and derivation of Hybrid π model elements.

FET Amplifiers: Analysis of Common Source and Common Drain JFET Amplifiers, Comparison of performance with BJT Amplifiers

UNIT-III

Number System and Boolean Algebra: Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal, Unit Distance Code, Digital Logic Gates (AND, NAND, OR, NOR, EX-OR, EX-NOR), Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

UNIT-IV**Minimization Techniques:**

The Karnaugh Map Method, Three, Four and Five Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Multilevel NAND/NOR realizations.

UNIT-V

Combinational Circuits:

Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Multiplexer/Demultiplexer, decoder, encoder, Code converters, Magnitude Comparator.

Sequential circuits:

Latches, Flip-Flops-SR, JK, D, T and master slave, characteristic tables and equation.

TEXT BOOKS:

1. “Electronic Devices & Circuits”, Special Edition – MRCET, McGraw Hill Publications, 2017.
2. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGraw Hill.
3. Electronic Devices and Circuits, S.Salivahanan,N.Suresh kumar, McGraw Hill.
4. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 /Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
5. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.

REFERENCE BOOKS:

1. Electronic Devices and Circuits,K.Lal Kishore B.S Publications
2. Electronic Devices and Circuits, G.S.N. Raju, I.K. International Publications, New Delhi, 2006.
3. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
4. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
5. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.

OUTCOMES:

After completion of the course, the student will be able to:

1. Design the amplifiers with various biasing techniques
2. Design single stage amplifiers using BJT and FET
3. Understand the basic postulates of Boolean algebra and shows the correlation between Boolean expressions
4. Learn the methods for simplifying Boolean expressions
5. Understand the formal procedures for the analysis and design of combinational circuits and sequential circuits

(R22A0471) ANALOG AND DIGITAL ELECTRONICS LAB

COURSE OBJECTIVES:

1. To conduct experiment and plot input and output characteristics of BJT in different configurations.
2. To analyze various amplifiers such as Common Emitter, Common Collector amplifiers
3. To study and verify Basic Gates (AND, OR & NOT), Universal Gates (NAND & NOR) and implement Boolean Functions using the gates.
4. To realize Digital Circuits for various applications.

(For Laboratory Examination – Minimum of 10 experiments)

1. Input and output characteristics of a BJT in CE configuration
2. Input and output characteristics of a BJT in CB configuration
3. Calculation of h-Parameters of CB Configuration from Input and Output Characteristics
4. Calculation of h-Parameters of CE Configuration from Input and Output Characteristics
5. Frequency Response of CE Amplifier
6. Frequency Response of CC Amplifier
7. FET Characteristics
8. Study and verification of Basic Gates (AND, OR & NOT)
9. Study and verification of Universal Gates (NAND & NOR)
10. Implementation of the given Boolean function using logic gates
11. Realization of Half Adder & Full Adder using Basic gates
12. Realization of Half Subtractor & Full Subtractor using Basic gates
13. Multiplexer and De-Multiplexer
14. Encoder and Decoder

COURSE OUTCOMES

1. Conducting experiment and plotting input and output characteristics of BJT in different configurations.
2. Analyze various amplifiers such as Common Emitter, Common Collector amplifiers
3. Studying and verifying Basic Gates (AND, OR & NOT), Universal Gates (NAND & NOR) and implement Boolean Functions using the gates.
4. Realizing Digital Circuits for various application

Major Equipment required for Laboratories:

1. Regulated Power Suppliers, 0-30V 5. 20 MHz, Dual Channel Cathode Ray Oscilloscopes.
2. Functions Generators-Sine and Square wave signals
3. Multi meters
4. Electronic Components