SRI VENKATESWARA COLLEGE OF ENGINEERING

(AUTONOMOUS)

Karakambadi Road Tirupati-517 507

Department of Electrical &Electronics Engineering

Course Structure for

I Year

R 23 Regulations

Electrical and Electronics Engineering

Semester - 1 (Theory - 5, Lab 4, MC-1)					
S.No	**Course No**	**Course Name**	**Category**	**L-T-P/D**	**Credits**
1.	EE23AES101	Basic Electrical and Electronics Engineering	ES	3-0-0	3
2.	EG23AHS101	Communicative English	HS	2-0-0	2
3.	PH23ABS101	Engineering Physics	BS	3-0-0	3
4.	CS23AES101	Introduction to Programming	ES	3-0-0	3
5.	MA23ABS101	Linear Algebra & Calculus	BS	3-0-0	3
6.	EG23AHS102	Communicative English Lab	HS	0-0-2	1
7.	CS23AES102	Computer Programming Lab	ES	0-0-3	1.5
8.	EE23AES102	Electrical and Electronics Engineering Workshop	ES	0-0-3	1.5
9.	PH23ABS102	Engineering Physics Lab	BS	0-0-2	1
10.	CH23ABS105	Health and Wellness, Yoga and Sports	BS	0-0-1	0.5
Total					**19.5**

Semester – 2 (Theory – 4, Lab –5 , MC-2)					
S.No	**Course No**	**Course Name**	**Category**	**L-T-P**	**Credits**
1.	ME23AES101	Basic Civil & Mechanical Engineering	ES	3-0-0	3
2.	MA23ABS201	Differential Equations & Vector Calculus	BS	3-0-0	3
3.	EE23APC201	Electrical Circuit Analysis-1	PC	3-0-0	3
4.	CH23ABS101	Chemistry	BS	3-0-0	3
5.	ME23AES102	Engineering Graphics	ES	1-0-4	3
6.	EE23APC202	Electrical Circuit Analysis Lab	PC	0-0-3	1.5
7.	CH23ABS102	Chemistry Lab	BS	0-0-2	1
8.	ME23AES103	Engineering Workshop	ES	0-0-3	1.5
9.	CS23AES103	IT Workshop	BS	0-0-2	1
10.	CH23ABS106	NSS/NCC/Scouts & Guides / Community Service	BS	0-0-1	0.5
Total					**20.5**

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech - I Sem

L	T	P	C
3	0	0	3

(EE23AES101) BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Common to All branches of Engineering)

Course Objectives:

- To gain the knowledge about various laws, simplification techniques and principles associated with electrical circuits
- To acquire basic knowledge about the Electric machines, their principle of operation and the concept of measuring instruments.
- To understand the concept of Power Generation, Electricity Bill and Safety Measures.

Course Outcomes:

CO1: Apply the knowledge of theorems/laws to analyze the simple AC and DC circuits

CO2: Illustrate the operating principles of various electrical machines and electrical measuring equipment's

CO3: Understand the basic concepts of electrical power generation, Electricity Bill and Safety Measures

PART A: BASIC ELECTRICAL ENGINEERING

UNIT – 1

DC & AC Circuits

DC Circuits: Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL & KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple numerical problems.

AC Circuits: A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).

UNIT – 2

Machines and Measuring Instruments

Machines: Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii) Single Phase Transformer, (iv) Three Phase Induction Motor and (v) Alternator, Applications of electrical machines.

Measuring Instruments: Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone Bridge.

UNIT - 3

Energy Resources, Electricity Bill & Safety Measures Energy Resources:

Conventional and non-conventional energy resources; Layout and operationof various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation.

Electricity bill: Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition.
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013.
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition.

Reference Books:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition.
2. Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers,2020.
3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, OxfordUniversity Press, 2017.
4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.

PART B: BASIC ELECTRONICS ENGINEERING

Course Objectives:

- To understand the working principle of various electronic devices.
- To acquire knowledge on the operating conditions of a DC power supply system, amplifiers and general electronic instrumentation system.
- To learn basic techniques in the design of a logic circuit.

Course Outcomes:

CO1: Apply the concept of science and mathematics to understand the working principles of electronic devices.
CO2: Analyze the working principle of a DC power supply system and Amplifiers.
CO3: Solve digital logic circuits and implement using different logic gates.

UNIT – 1 SEMICONDUCTOR DEVICES

Introduction - Evolution of electronics - Characteristics of PN Junction Diode - Zener Effect- Zener Diode and its Characteristics. Bipolar Junction Transistor - CB, CE, CC Configurations and Characteristics - Elementary Treatment of Small Signal CE Amplifier.

UNIT – 2

BASIC ELECTRONIC CIRCUITS AND INSTRUMENTATION

Rectifiers and power supplies: Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple Zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. Electronic Instrumentation: Block diagram of an electronic instrumentation system.

UNIT – 3

DIGITAL ELECTRONICS

Overview of Number Systems, Logic gates including Universal Gates, BCD codes, Excess-3 code, Gray code, Hamming code. Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adder, Introduction to sequential circuits, Flip flops, Registers and counters (Elementary Treatment only).

Textbooks:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill,2009

Reference Books:

- R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand &Co, 2010.
- Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.
- R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

B.Tech - I Sem

L	T	P	C
2	0	0	2

(EG23AHS101) COMMUNICATIVE ENGLISH

(Common to All Branches of Engineering)

Course Objectives:

The main objective of introducing this course, Communicative English, is to facilitate effective listening, Reading, Speaking and Writing skills among the students. It enhances the same in their comprehending abilities, oral presentations, reporting useful information and providing knowledge of grammatical structures and vocabulary. This course helps the students to make them effective in speaking and writing skills and to make them industry ready.

Course Outcomes:

CO1: Understand the context, topic, and pieces of specific information from social or Transactional dialogues.

CO2: Apply grammatical structures to formulate and correct word forms.

CO3: Analyze discourse markers to speak clearly on a specific topic in informal discussions.

CO4: Evaluate reading/listening texts and write summaries based on global comprehension of these texts.

CO5: Create a coherent paragraph, essay, and resume.

UNIT - 1

Lesson: HUMAN VALUES: The Gift of the Magi (Short Story)

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions.

Speaking: Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and others.

Reading: Skimming to get the main idea of a text; scanning to look for specific pieces of information.

Writing: Mechanics o f Writing-Capitalization, Spellings, Punctuation-Parts of Sentences.

Grammar: Parts of Speech, Basic Sentence Structures-forming questions.

Writing: Synonyms, Antonyms, Affixes (Prefixes/Suffixes), Root words.

UNIT – 2

Lesson: NATURE: The Brook by Alfred Tennyson (Poem)

Listening : Answering a series of questions about main ideas and supporting ideas after listening to audio texts.

Speaking : Discussion in pairs/small groups on specific topics followed by short structure talks.

Reading : Identifying sequence of ideas; recognizing verbal techniques that help to link the ideas in a paragraph together.

Writing : Structure of a paragraph - Paragraph writing (specific topics)

Grammar : Cohesive devices - linkers, use of articles and zero article; prepositions.

Vocabulary : Homonyms, Homophones, Homographs.

UNIT - 3

Lesson: BIOGRAPHY: Elon Musk

Listening: Listening for global comprehension and summarizing what is listened to.
Speaking: Discussing specific topics in pairs or small groups and reporting what isdiscussed.
Reading: Reading a text in detail by making basic inferences -recognizing and interpreting specific context clues; strategies to use text clues for comprehension.
Writing: Summarizing, Note-making, paraphrasing.
Grammar: Verbs - tenses; subject-verb agreement; Compound words, Collocations.
Vocabulary: Compound words, Collocation.

UNIT - 4

Lesson: INSPIRATION: The Toys of Peace by Saki

Listening: Making predictions while listening to conversations/ transactional dialogues without video; listening with video.
Speaking: Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.
Reading: Studying the use of graphic elements in texts to convey information, reveal trends / patterns / relationships, communicate processes or display complicated data.
Writing: Letter Writing: Official Letters, Resumes
Grammar: Reporting verbs, Direct & Indirect speech, Active & Passive Voice.
Vocabulary: Words often confused, Jargons.

UNIT - 5

Lesson: MOTIVATION: The Power of Intrapersonal Communication (An Essay)

Listening : Identifying key terms, understanding concepts and answering a series of relevant questions that test comprehension
Speaking : Formal oral presentations on topics from academic contexts
Reading : Reading comprehension.
Grammar : Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement).
Vocabulary: Technical Jargons

Textbooks:

1. Pathfinder: Communicative English for Undergraduate Students, 1st Edition, Orient Black Swan, 2023 (Units 1,2 & 3).
2. Empowering with Language by Cengage Publications, 2023 (Units 4 & 5).

Reference Books:

1. Dubey, Sham Ji & Co. English for Engineers, Vikas Publishers, 2020
2. Bailey, Stephen. Academic writing: A Handbook for International Students. Routledge, 2014.
3. Murphy, Raymond. English Grammar in Use, Fourth Edition, Cambridge University Press, 2019.
4. Lewis, Norman. Word Power Made Easy- The Complete Handbook for Building a Superior Vocabulary. Anchor, 2014.

Web Resources:

GRAMMAR:

1. www.bbc.co.uk/learningenglish
2. https://dictionary.cambridge.org/grammar/british-grammar/
3. www.eslpod.com/index.html
4. https://www.learngrammar.net/
5. https://english4today.com/english-grammar-online-with-quizzes/
6. https://www.talkenglish.com/grammar/grammar.aspx

VOCABULARY

1. https://www.youtube.com/c/DailyVideoVocabulary/videos
2. https://www.youtube.com/channel/UC4cmBAit8i_NJZE8qK8sfpA

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B.Tech – I Sem

L	T	P	C
3	0	0	3

(PH23ABS101) ENGINEERING PHYSICS

(Common to All Branches of Engineering)

Course Objectives:

To bridge the gap between the Physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

Course Outcomes:

CO1: **Understand** the intensity variation of light due to interference, diffraction and polarization.

CO2: **Apply** the basic concepts of crystal structures and X-ray diffraction to study the behaviour of materials for engineering applications.

CO3: **Summarize** the fundamental properties of dielectric and magnetic materials for engineering applications.

CO4: **Analyze** the properties of quantum particles to interpret the energy band formation and classification of solids.

CO5: **Assess** the current flow mechanism to understand the transport phenomenon of charge carriers in semiconductors.

UNIT I Wave Optics

Interference: Introduction - Principle of superposition –Interference of light Interference in thin films (Reflection Geometry) & applications - Colours in thin films- Newton's Rings, Determination of wavelength and refractive index.

Diffraction: Introduction - Fresnel and Fraunhofer diffractions - Fraunhofer diffraction due to single slit, double slit & N-slits (Qualitative) – Diffraction Grating - Dispersive power and resolving power of Grating (Qualitative).

Polarization: Introduction -Types of polarization - Polarization by reflection, refraction and Double refraction - Nicol's Prism -Half wave and Quarter wave plates.

UNIT II Crystallography and X-ray diffraction

Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes.

X- ray diffraction: Bragg's law - X-ray Diffractometer – crystal structure determination by Laue's and powder methods.

UNIT III Dielectric and Magnetic Materials

Dielectric Materials: Introduction - Dielectric polarization - Dielectric polarizability, Susceptibility, Dielectric constant and Displacement Vector – Relation between the electric vectors - Types of polarizations- Electronic (Quantitative), Ionic (Quantitative) and Orientation polarizations (Qualitative)
- Lorentz internal field - Clausius- Mossotti equation – Frequency dependence of polarization – dielectric loss.

Magnetic Materials: Introduction - Magnetic dipole moment - Magnetization- Magnetic susceptibility and permeability – Atomic origin of magnetism - Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Domain concept for Ferromagnetism & Domain walls (Qualitative) - Hysteresis - soft and hard magnetic materials- Applications of magnetic materials.

UNIT IV Quantum Mechanics and Free Electron Theory

Quantum Mechanics: Dual nature of matter – Heisenberg's Uncertainty Principle – Significance and properties of wave function – Schrodinger's time independent and dependent wave equations– Particle in a one-dimensional infinite potential well.

Free Electron Theory: Classical free electron theory (Qualitative with discussion of merits and demerits) – Quantum free electron theory – electrical conductivity based on quantum free electron theory - Fermi-Dirac distribution
- Density of states - Fermi energy

UNIT V Semiconductors

Semiconductors: Formation of energy bands – classification of solids - Intrinsic semiconductors: Density of charge carriers – Electrical conductivity – Fermi level – Extrinsic semiconductors: density of charge carriers (Qualitative) – dependence of Fermi energy on carrier concentration and temperature - Drift and diffusion currents – Einstein's equation – Hall effect and its applications - Direct and indirect bandgap semiconductors and its applications.

Textbooks:

1. A Text book of Engineering Physics, M. N. Avadhanulu, P.G.Kshirsagar & TVS ArunMurthy, S. Chand Publications, 11th Edition 2019.
2. Engineering Physics - D.K.Bhattacharya and Poonam Tandon, Oxford press (2015).

Reference Books:

1. Engineering Physics - B.K. Pandey and S. Chaturvedi, CengageLearning 2021.
2. Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. Engineering Physics" - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press.2010
4. Engineering Physics - M.R. Srinivasan, New Age internationalpublishers (2009).

Web Resources: https://www.loc.gov/rr/scitech/selected-ternet/physics.html

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B.Tech - I Sem

L	T	P	C
3	0	0	3

(CS23AES101) INTRODUCTION TO PROGRAMMING

Course Objectives:

- To learn how to solve a given problem.
- To illustrate the basic concepts of C programming language.
- To discuss the concepts of Functions, Arrays, Pointers and Structures.
- To familiar with Dynamic memory allocation concepts.
- To apply concepts of structures and files to solve real word problems.

Course Outcomes:

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

CO1: Solve computational problems (L3).

CO2: Select the features of C language appropriate for solving a problem (L4)

CO3: Design computer programs for real world problems (L6)

CO4: Organize the data which is more appropriated for solving a problem (L6).

UNIT-1

Introduction to Problem Solving:

Problem Solving Aspect, Problem Identification, Problem Understanding, Algorithm Development, Solution Planning, characteristics of algorithm, Top-down approach, Bottom-up approach, Time and space complexities of algorithms, Flowchart.

Overview of C: History Of C, C Language Elements, Basic Structure of C Program, C Tokens-Variables and Data Types, Operators, Expressions and Type Conversions.

Learning Outcomes:

The students will be able to

- Develop solution through problem understanding and decomposition (L6).
- Develop basic flowcharts for performing input and output and computations (L3).
- Use C basic concepts to write simple C programs (L3).

UNIT-2

Control Statements: Selection Statements- if and switch statements.
Iterative Statements: for, while and do-while statements.
Jump Statements: break, continue, go to statements.

Learning Outcomes:

The students will be able to

- Implement C program using Conditional statements (L2).
- Implement C program using Iterative statements (L2).

UNIT-3

Arrays:

Declaration, accessing array elements, Storing values, Operations on arrays, multi-dimensional arrays.

Functions: Introduction, Using Functions, Function declaration, Function definition and Function call, Parameter passing, Passing arrays to functions, Recursion, Storage classes.

Learning Outcomes:

The students will be able to

- Write Structured programs using Functions (L5).
- Apply arrays concepts on real time applications (L6).

UNIT-4

Pointers: Declaration and Initialization of pointer variables, Pointer arithmetic, Pointers and arrays, Pointer to pointer, Array of pointers, Pointers and functions, Dynamic Memory Allocation.

Strings: Introduction to Strings, String handling functions, Preprocessor Directives.

Learning Outcomes:

The students will be able to

- Use pointers to write c Programs (L3).
- Understand the concepts of preprocessors (L2).
- Apply Dynamic Memory Allocation concepts on real time applications (L6).

UNIT-5

Structures: Introduction, Nested Structures, Array of Structures, Structures and Functions, Unions.

Files in C: Using Files in C, read data from Files, Writing data to Files, Random access to files, Command-line Arguments

Learning Outcomes:

The students will be able to

- Use the concepts of Structures and Unions to write C programs (L3).
- Apply various operations on Files (L6).

Text Books:

1. B. A. Forouzan and R. F. Gilberg, Computer Science: A Structured Programming Approach Using C, 3/e, Cengage Learning, 2007.
2. Problem solving with C, M.T.Somashekara, PHI

Reference Books:

1. Jeri R. Hanly, Ellot B. Koffman, Problem Solving and Program Design in C, 5/e, Pearson
2. Brian W Kernighan and Dennis M Ritchie, The C Programming Language, Second Edition, Prentice Hall Publication.
3. Reema Thareja, Programming in C, Oxford University Press, AICTE Edition, 2018.
R.G. Dromey, "How to Solve it by Computer". 2014, Pearson.

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B.Tech - I Sem

L	T	P	C
3	0	0	3

(MA23ABS101) LINEAR ALGEBRA & CALCULUS

(Common to All Branches)

Course Objectives:

- This course will illuminate the students in the concepts of calculus and linear algebra.
- To equip the students with standard concepts and tools at an intermediate to advanced level mathematics to develop the confidence and ability among the students to handle various real world problems and their applications.

Course Outcomes:

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

CO1: Understanding the concepts of matrix algebra techniques to solve the system of linear equations. (L2)

CO2: Develop the use of matrix algebra techniques that is needed by engineers for practical applications (L6)

CO3: Apply mean value theorems to solve real life problems in engineering. (L3)

CO4: Make use of partial differentiation to solve optimization problems. (L3)

CO5: Familiarize with double and triple integrals of functions of several variables in two dimensions using Cartesian and polar coordinates and in three dimensions using cylindrical and spherical coordinates. (L3)

UNIT -1

Matrices

Rank of a matrix by echelon form, normal form, Cauchy–Binet formulae (without proof). Inverse of Non- singular matrices by Gauss-Jordan method, System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations by Gauss elimination method, Jacobi and Gauss Seidel Iteration Methods.

Learning Outcomes:

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

1. To find the rank and inverse of the matrix by using elementary transformations (L1).
2. Solving system of linear equations by various methods (L3).

UNIT -2

Eigenvalues, Eigenvectors and Orthogonal Transformation

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

Learning Outcomes:

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

1. Understanding the Eigen values and their Eigen vectors and properties (L2).
2. Determine Inverse and Power by using Cayley Hamilton theorem (L3).
3. Reduce Quadratic form to Canonical form by Orthogonal Transformation andtheir properties (L3).

UNIT -3

Calculus

Mean Value Theorems: Rolle's Theorem, Lagrange's mean value theorem with their geometrical interpretation, Cauchy's mean value theorem, Taylor's and Maclaurin theorems with remainders (without proof), Problems and applications on the above theorems.

Learning Outcomes:

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

1. Translate the function as series of Taylor's and Maclaurin's with remainders (L3)
2. To identifying the roots of the functions in specified intervals by mean value theorems (L2)

UNIT -4

Partial differentiation and Applications (Multi variable calculus)

Functions of several variables: Continuity and Differentiability, Partial derivatives, total derivatives, chain rule, Taylor's and Maclaurin's series expansion of functions of two variables. Jacobians, Functional dependence, maxima and minima of functions of two variables, method of Lagrange multipliers.

Learning Outcomes:

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

1. Understanding the concepts of partial and total derivatives and find the Functional relation using Jacobian (L2)
2. Obtain the Taylor's and Maclaurin's series expansion of functions of two variables (L3)

UNIT -5

Multiple Integrals (Multi variable Calculus)

Double integrals, triple integrals, change of order of integration, change of variables to polar, cylindrical and spherical coordinates. Finding areas (by double integrals) and volumes (by double integrals and triple integrals).

Learning Outcomes:

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

1. Determine surface areas and volumes by using Multiple integrals (L3)
2. Evaluate multiple integrals in Cartesian, cylindrical and spherical geometries(L5)

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers,2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

Reference Books:

1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
3. Glyn James, Advanced Modern Engineering Mathematics, 4/e, Pearson publishers, 2011.
4. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education
5. H. k Das, Er. RajnishVerma, Higher Engineering Mathematics, S. Chand.
6. N. Bali, M. Goyal, C. Watkins, Advanced Engineering Mathematics, Infinity Science Press.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

B.Tech - I Sem

L	T	P	C
0	0	2	1

(EG23AHS102) COMMUNICATIVE ENGLISH LAB

(Common to all Branches of Engineering)

Course Objectives:

The main objective of introducing this course, Communicative English Laboratory, is to expose the students to a variety of self-instructional, learner friendly modes of language learning. The students will get trained in basic communication skills and also make them ready to face job interviews.

Course Outcomes:

CO1: Understand the different aspects of the English language proficiency with anemphasis on LSRW skills.
CO2: Apply communication skills through various language learning activities.
CO3: Analyze the English speech sounds, stress, rhythm, intonation, and syllable division for better listening and speaking comprehension.
CO4: Evaluate and exhibit professionalism in participating in debates and group discussions.
CO5: Create effective Course Objectives.

List of Topics:

1. Vowels & Consonants
2. Neutralization/Accent Rules
3. Communication Skills & JAM
4. Role Play or Conversational Practice
5. E-mail Writing
6. Resume Writing, Cover letter, SOP
7. Group Discussions-methods & practice
8. Debates - Methods & Practice
9. PPT Presentations/ Poster Presentation
10. Interviews Skills

Suggested Software:

- Walden InfoTech
- Young India Films

Reference Books:

1. Raman Meenakshi, Sangeeta-Sharma. Technical Communication. Oxford Press.2018.
2. Taylor Grant: English Conversation Practice, Tata McGraw-Hill Education India, 2016.
3. Hewing's, Martin. Cambridge Academic English (B2). CUP, 2012.
4. J. Sethi & P.V. Dhamija. A Course in Phonetics and Spoken English, (2nd Ed), Kindle, 2013

Web Resources:

Spoken English:

1. www.esl-lab.com
2. www.englishmedialab.com
3. www.englishinteractive.net
4. https://www.britishcouncil.in/english/online
5. http://www.letstalkpodcast.com/
6. https://www.youtube.com/c/mmmEnglish_Emma/featured
7. https://www.youtube.com/c/ArnelsEverydayEnglish/featured
8. https://www.youtube.com/c/engvidAdam/featured
9. https://www.youtube.com/c/EnglishClass101/featured
10. https://www.youtube.com/c/SpeakEnglishWithTiffani/playlists
11. https://www.youtube.com/channel/UCV1h_cBE0Drdx19qkTM0WNw

Voice & Accent:

1. https://www.youtube.com/user/letstalkaccent/videos
2. https://www.youtube.com/c/EngLanguageClub/featured
3. https://www.youtube.com/channel/UC_OskgZBoS4dAnVUgJVexc
4. https://www.youtube.com/channel/UCNfm92h83W2i2ijc5Xwp_IA

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech - I Sem

L	T	P	C
0	0	3	1.5

(CS23AES102) COMPUTER PROGRAMMING LAB
(Common to All branches of Engineering)

Course Objectives:

- To use basic data types, operators, expressions and expression evaluation mechanisms using C Programming Language.
- To implement control flows, construct in C Programming Language and understand the syntax, semantics and usability contexts of these different constructs.
- To develop composite data types in C and constructs available to develop their datat ypes, utilize them to model things and dealing with data from and to external files.
- To design programs with different variations of the constructs available for practicing modular programming and understand the pros and cons of using different variants and apply optimization.

Course Outcomes: Student should be able to

CO1: Read, understand and trace the execution of programs written in C language.

CO2: Select the right control structure for solving the problem.

CO3: Develop C programs which utilize the memory efficiently using programming constructs like pointers.

CO4: Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.

UNIT I

WEEK 1

Objective: Getting familiar with the programming environment on the computer and writing the first program.

Activities:

Tutorial 1: Problem-solving using Computers.

Lab1: Familiarization with programming environment

i) Basic Linux environment and its editors like Vi, Vim & Emacs etc.

ii) Exposure to Turbo C, gcc.

iii) Writing simple programs using printf (), scanf ()

WEEK 2

Objective: Getting familiar with how to formally describe a solution to a problem in a series of finite steps both using textual notation and graphic notation.

Activities:

Tutorial 2: Problem-solving using Algorithms and Flow charts.

Lab 1: Converting algorithms/flow charts into C Source code. Developing the algorithms/flowcharts for the following sample programs

i) Sum and average of 3 numbers
ii) Conversion of Fahrenheit to Celsius and vice versa
iii) Simple interest calculation

WEEK 3

Objective: Learn how to define variables with the desired data-type, initialize them with appropriate values and how arithmetic operators can be used with variables and constants.

Activities:

Tutorial 3: Variable types and type conversions:

Lab 3: Simple computational problems using arithmetic expressions.

1. Finding the square root of a given number
2. Finding compound interest
3. Area of a triangle using heron's formulae
4. Distance travelled by an object

WEEK 4

Objective: Explore the full scope of expressions, type-compatibility of variables & constants and operators used in the expression and how operator precedence works.

Activities:

Tutorial4: Operators and the precedence and as associativity:

Lab4: Simple computational problems using the operator precedence and associativity

i) Evaluate the following expressions.
   a. A+B*C+(D*E) + F*G
   b. A/B*C-B+A*D/3
   c. A+++B---A
   d. J= (i++) + (++i)
ii) Find the maximum of three numbers using conditional operator
iii) Take marks of 5 subjects in integers, and find the total, average in float

WEEK 5

Objective: Explore the full scope of different variants of "if construct" namely if-else, null- else, if-else if*-else, switch and nested-if including in what scenario each one of them can be used and how to use them. Explore all relational and logical operators while writing conditionals for "if construct".

Suggested Experiments/Activities:

Tutorial 5: Branching and logical expressions:

Lab 5: Problems involving if-then-else structures.

i) Write a C program to find the max and min of four numbers using if-else.
ii) Write a C program to generate electricity bill.
iii) Find the roots of the quadratic equation.
iv) Write a C program to simulate a calculator using switch case.
v) Write a C program to find the given year is a leap year or not.

WEEK 6

Objective: Explore the full scope of iterative constructs namely while loop, do-while loop and for loop in addition to structured jump constructs like break and continue including when each of these statements is more appropriate to use.

Activities: Tutorial 6: Loops, while and for loops

Lab 6: Iterative problems e.g., the sum of series

i) Find the factorial of given number using any loop.
ii) Find the given numberis a prime or not.
iii) Compute sine and cos series.
iv) Checking a number palindrome.
v) Construct a pyramid of numbers.

WEEK 7:
Objective: Explore the full scope of Arrays construct namely defining and initializing 1-D and 2-D and more generically n-D arrays and referencing individual array elements from the defined array. Using integer 1-D arrays, explore search solution linear search.

Activities: Tutorial 7: 1 D Arrays: searching.
Lab 7:1D Array manipulation, linear search
i) Find the min and max of a 1-D integer array.
ii) Perform linear search on1Darray.
iii) The reverse of a 1D integer array
iv) Find 2's complement of the given binary number.
v) Eliminate duplicate elements in an array.

WEEK 8:
Objective: Explore the difference between other arrays and character arrays that can be used as Strings by using null character and get comfortable with string by doing experiments that will reverse a string and concatenate two strings. Explore sorting solution bubble sort using integer arrays.

Activities: Tutorial 8: 2 D arrays, sorting and Strings.
Lab 8: Matrix problems, String operations, Bubble sort
i) Addition of twomatrices
ii) Multiplication two matrices
iii) Sort array elements using bubble sort
iv) Concatenate two strings without built-in functions
v) Reverse a string using built-in and without built-in string functions

WEEK 9:
Objective: Explore the Functions, sub-routines, scope and extent of variables, doing some experiments by parameter passing using call by value. Basic methods of numerical integration
Activities:
Tutorial 9: Functions, call by value, scope and extent,
Lab 9: Simple functions using call by value, solving differential equations using Eulers theorem
i) Write a C function to calculate NCR value
ii) Write a C function to find the length of a string
iii) Write a C function totranspose of a matrix
iv) Write a C function to demonstrate numerical integration of differentialequations using Euler's method

WEEK 10:
Objective: Explore how recursive solutions can be programmed by writing recursive functions that can be invoked from the main by programming at-least five distinct problems that have naturally recursive solutions.

Activities:

Tutorial 10: Recursion, the structure of recursive calls

Lab 10: Recursive functions

i) Write a recursive function to generate Fibonacci series
ii) Write a recursive function to find the lcm of two numbers
iii) Write arecursive function to find the factorial of a number
iv) Write a C Program to implement Ackermann function using recursion
v) Write a recursive function to find the sum of series.

WEEK 11:

Objective: Explore the basic difference between normal and pointer variables, Arithmetic operations using pointers and passing variables to functions using pointers

Activities:

Tutorial 11: Call by reference, dangling pointers

Lab 11: Simple functions using Call by reference, Dangling pointers

i) Write a C program to swap two numbers using call by reference
ii) Demonstrate Dangling pointer problem using a C program
iii) Write a C program to copy one string into another using pointer
iv) Write a C program to find no of lowercase, uppercase, digits and other characters using pointers.

WEEK12:

Objective: Explore pointers to manage a dynamic array of integers, including memory allocation & value initialization, resizing changing and reordering the contents of an array and memory de-allocation using malloc (), calloc (), realloc () and free () functions. Gain experience processing command-line arguments received by C.

Suggested Experiments/Activities:

Tutorial 12: Pointers, structures and dynamic memory allocation

Lab12: Pointers and structures, memory dereference.

i) Write a C program to find the sum of a 1D array using malloc()
ii) Write a C program to find the total, average of n students using structures
iii) Enter n students data using calloc() and display failed students list
iv) Read student name and marks from the command line and display the student details along with the total.
v) Write a C program to implement realloc()

WEEK 13:

Objective: Experiment with C Structures, Unions, bit fields and nested structures

Activities:

Tutorial 13: Bit fields, Self-Referential Structures, Linked lists

Lab13: Bit fields, linked lists Read and print a date using dd/mm/yyyy format using bit-fields and differentiate the s a m e without using bit- fields

i) Demonstrate the differences between structures and unions using a C program
ii) Write a C program to shift/rotate using bitfields.
iii) Write a C program to copy one structure variable to another structure of the same type.

WEEK14:
Objective: To understand data files and file handling with various file I/O functions. Explore the differences between text and binary files.

Activities: Tutorial 14: File handling
Lab 14: File operations
i) Write a C program to write and read text into a file.
ii) Write a C program to write and read text into a binary file using fread() and fwrite().
iii) Copy the contents of one file to another file.
iv) Write a C program to merge two files into the third file using command-line arguments.
v) Find no. of lines, words and characters in a file
vi) Write a C program to print last n characters of a given file.

Textbooks:
1. Ajay Mittal, Programming in C: A practical approach, Pearson.
2. Byron Gottfried, Schaum' s Outline of Programming with C, McGraw Hill.

Reference Books:
1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice- Hall of India.
2. C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, Cengage.

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech - I Sem

L	T	P	C
0	0	3	1.5

(EE23AES102) ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP
(Common to All branches of Engineering)

PART A: ELECTRICAL ENGINEERING LAB

Course Objectives:

- To gain the practical knowledge about various laws/theorems for the given circuit.
- To acquire knowledge about various electrical measuring instruments and safety measures.
- To obtain the performance characteristics of DC generator.

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

CO1: Understand the concept of KCL, KVL and Theorems practically for the given circuit.
CO2: Evaluate the resistance, power and power factor of circuit elements by using measuring instruments.
CO3: Obtain the Magnetization Characteristics of DC shunt Generator

List of Experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator
5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger
7. Calculation of Electrical Energy for Domestic Premises

Reference Books:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition.
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013.
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers,2014, Third Edition.

Note: Minimum Six Experiments to be performed.

PART B: ELECTRONICS ENGINEERING LAB

Course Objectives:

- To gain hands on experience in testing various electronic components.
- To acquire knowledge related to the use of electronic measuring instruments for different applications.
- To design and simulate a RC coupled amplifier.
- To verify the operating conditions of combinational and sequential circuits.

Course Outcomes:

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

CO1: Identify & Test various electronic components.

CO2: Employ various electronic measuring instruments for different applications.

CO3: Evaluate the biasing conditions of various diodes and BJTs.

CO4: Examine the operating conditions of a digital circuit.

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V – I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
   i. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
7. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs. Tools / Equipment Required: DC Power supplies, Multi meters, DC Ammeters, DC Voltmeters, AC Voltmeters, CROs, all the required active devices.

References:

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009
3. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education, 2009.

Note: Minimum **Six** Experiments to be performed. All the experiments shall be implemented using both Hardware and Software.

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B.Tech – I Sem

L	T	P	C
0	0	2	1

(PH23ABS102) ENGINEERING PHYSICS LAB

(Common to All Branches of Engineering)

Course Objectives:

To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity, Hall effect in semiconductors, study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:

The students will be able to

CO1: **Compare** the wavelengths of different colours using diffraction grating.

CO2: **Utilize** optical instruments like travelling microscope and spectrometer.

CO3: **Analyze** the intensity of the magnetic field of circular coil carryingcurrent with distance.

CO4: **Evaluate** dielectric constant for a dielectric material.

CO5: **Estimate** the band gap of a given semiconductor and the type of semiconductor using Hall effect.

List of Experiments:

1. Determination of radius of curvature of a given Plano-convex lens by Newton's rings.
2. Determination of wavelengths of different spectral lines in mercury spectrum using diffraction grating in normal incidence configuration.
3. Determination of dielectric constant using charging and dischargingmethod.
4. Study the variation of B versus H by magnetizing the magnetic material (B- H curve).
5. Determination of wavelength of Laser light using diffraction grating.
6. Estimation of Planck's constant using photoelectric effect.
7. Determination of the resistivity of semiconductors by four probe methods.
8. Determination of energy gap of a semiconductor using p-n junction diode.
9. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
10. Determination of Hall voltage and Hall coefficient of a given semiconductorusing Hall effect.
11. Determination oftemperature coefficients of a thermistor.
12. Sonometer: Verification of laws of stretched string.

Note: Any TEN of the listed experiments are to be conducted. Out of whichany TWO experiments may be conducted in virtual mode.

References:

A Textbook of Practical Physics - S. Balasubramanian, M.N. Srinivasan, S. Chand Publishers, 2017.

Web Resources

www.vlab.co.inhttps://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html,prototype

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B.Tech – I Sem

L	T	P	C
0	0	1	0.5

(CH23ABS105) HEALTH AND WELLNESS, YOGA AND SPORTS
(Common to All branches of Engineering)

Course Objectives:

The main objective of introducing this course is to make the students maintain their mental and physical wellness by balancing emotions in their life. It mainly enhances the essential traits required for the development of the personality.

Course Outcomes:

After completion of the course the student will be able to

CO1: Understand the importance of yoga and sports for Physical fitness and sound health.
CO2: Demonstrate an understanding of health-related fitness components.
CO3: Compare and contrast various activities that help enhance their health.
CO4: Assess current personal fitness levels.
CO5: Develop Positive Personality

UNIT – 1

Concept of health and fitness, Nutrition and Balanced diet, basic concept of immunity Relationship between diet and fitness, Globalization and its impact on health, Body Mass Index (BMI) of all age groups.

Activities:

i) Organizing health awareness programmes in community.

ii) Preparation of health profile.

iii) Preparation of chart for balance diet for all age groups.

UNIT – 2

Concept of yoga, need for and importance of yoga, origin and history of yoga in Indian context, classification of yoga, Physiological effects of Asanas-Pranayama and meditation, stress management and yoga, Mental health and yoga practice.

Activities:

Yoga practices – Asana, Kriya, Mudra, Bandha, Dhyana, Surya Namaskar

UNIT – 3

Concept of Sports and fitness, importance, fitness components, history of sports, Ancient and Modern Olympics, Asian games and Commonwealth games.

Activities:

i) Participation in one major game and one individual sport viz., Athletics, Volleyball, Basketball, Handball, Football, Badminton, Kabaddi, Kho-kho, Table tennis, Cricket etc. Practicing general and specific warm up, aerobics

ii) Practicing cardiorespiratory fitness, treadmill, run test, 9 min walk, skipping and running.

Reference Books:

1. Gordon Edlin, Eric Golanty. Health and Wellness, 14th Edn. Jones &Bartlett Learning, 2022
2. T.K.V.Desikachar. The Heart of Yoga: Developing a Personal Practice
3. Archie J.Bahm. Yoga Sutras of Patanjali, Jain Publishing Company, 1993
4. Wiseman, John Lofty, SAS Survival Handbook: The Ultimate Guide to Surviving Anywhere Third Edition, William Morrow Paperbacks, 2014
5. The Sports Rules Book/ Human Kinetics with Thomas Hanlon. -- 3rd ed.Human Kinetics, Inc.2014 General

Guidelines:

1. Institutes must assign slots in the Timetable for the activities of Health/Sports/Yoga.
2. Institutes must provide field/facility and offer the minimum of five choices of as many as Games/Sports.
3. Institutes are required to provide sports instructor / yoga teacher tomentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totaling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.

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

3 0 0 3

(ME23AES101) BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to All branches of Engineering)

Course Objectives:

- Get familiarized with basic Construction Materials; the scope and importance of Civil Engineering specializations.
- Introduce the preliminary concepts of Structural and Geotechnical Engineering
- Acquire preliminary knowledge on Surveying and Transportation Engineering
- Get familiarized with the importance of Water Resources and Environmental Engineering.

Course Outcomes: On completion of the course, the student should be able to:

CO1: Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society. (L2)
CO2: Understand the basic characteristics of Construction Materials (L2)
CO3: Gain knowledge regarding Structural and Geotechnical Engineering (L1)
CO4: Explain the concepts of surveying and Transportation Engineering (L2)
CO5: Realize the importance of Water Resources and Environmental Engineering (L1)

UNIT – 1

Basics of Civil Engineering: Role of Civil Engineers in Society- Various Disciplines of Civil Engineering- Structural Engineering- Geo-Technical Engineering- Transportation Engineering - Hydraulics and Water Resources Engineering - Environmental Engineering- Scope of each discipline.

Construction Materials - Cement – Sand - Aggregate - Bricks- Cement concrete – Steel - Timber.

Learning Outcomes:

At the end of this Unit, students will be able to

- Understand the role of Civil Engineers in Society (L2)
- Explain the scope of various disciplines of Civil Engineering (L2)
- Describe the uses of various construction materials (L1)

UNIT – 2

Structural Engineering: Importance- Types of Structures and structural Members- Building Components –Building Planning principles.

Geotechnical Engineering: Types of Foundations-Functions and Requirement of a good foundation

Learning Outcomes:

At the end of this Unit, students will be able to

- Explain the importance of structural and geotechnical engineering (L2) List and describe various types of structures, structural members, foundations and their functions (L1)
- Understand the uses of various building components (L2)
- Apply the principles of Building Planning (L3)

UNIT – 3

Surveying & Transportation Engineering: Objectives and Principles of Surveying-Instruments used in Surveying-Importance of Transportation in Nation's economic development- Modes of Transportation- Types of Highway Pavements-Flexible Pavements and Rigid Pavements -Traffic signals and signs.

Water Resources and Environmental Engineering: Introduction to Hydrology–hydrological cycle- Sources of water- Quality of water- Specifications- Rainwater Harvesting- Water Storage and Conveyance Structures- Dams and Reservoirs-types and components.

Learning Outcomes*:*

At the end of this Unit, students will be able to

- Explain the importance of Surveying, Transportation Engineering, Water Resources and Environmental Engineering (L2)
- Understand the Objectives and Principles of Surveying and use of various instruments used in Surveying (L2)
- List and explain Modes of transportation and Types of Highway Pavements(L1)
- Demonstrate the occurrence of hydrological cycle and importance of rainwater harvesting (L2)
- Understand and explain the types and components of Dams and Reservoirs(L2)

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, Tata Mcgraw Hill publications (India) Pvt., Ltd., Fourth Edition.
2. Introduction to Civil Engineering, S.S.Bhavikatti, New Age International Publishers, 2022, First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol – I and Vol - II, S.K.Duggal, Tata McGraw Hill Publishers2019, Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi, 2016.
3. Irrigation Engineering and Hydraulic Structures – Santosh Kumar Garg, Khanna Publishers, Delhi 2023, 38thEdition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchandand Brothers Publications2019. 10thEdition.
5. Indian Standard DRINKING WATER — SPECIFICATIONIS 10500-2012.

PART B: BASIC MECHANICAL ENGINEERING

Course Objectives:

The students after completing the course are expected to

- Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.
- Understand and familiarize the different engineering materials and different manufacturing processes.
- Get an overview of different thermal and mechanical transmissionsystems and introduce basics of robotics and its applications.

Course Outcomes:

On completion of the course, the student should be able to

- Understand the different manufacturing processes (L1).
- Explain the basics of thermal engineering and its applications (L2).
- Describe the working of different mechanical power transmission systems and power plants and describe the basics of robotics and its applications (L2).

UNIT – 1

Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society- Technologies in Different Sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine Sectors.

Engineering Materials: Metals-Ferrous and Non-Ferrous, Ceramics, Composites, Smart Materials.

Learning Outcomes:

At the end of this Unit, the Student will be able to:

- Describe the key Sectors in which Mechanical Engineering Plays a Roleand understand their Significance in Society. (L1)
- Identify Various Types of Engineering Materials and Remember their Basic Characteristics. (L1)
- Understanding of how Mechanical Engineering Technologies are Applied in Each Sectors. (L2)

UNIT – 2

Manufacturing Processes: Principles of Casting, Forming, Joining Processes, Machining, Introduction to CNC Machines, 3D Printing, and Smart Manufacturing.
Thermal Engineering – Working Principle of Boilers, Otto Cycle, Diesel Cycle, Refrigeration and Air-Conditioning Cycles, IC Engines, 2-Stroke and 4- Stroke Engines, SI/CI Engines, Components of Electric and Hybrid Vehicles.

Learning Outcomes:

At the end of this Unit, the Student will be able to:

- List the various manufacturing processes like casting, forming, joining processes, machining, CNC machines, 3D printing and smart manufacturing. (L1)
- Understand the working principles of thermal engineering concepts. (L2)
- Describe the key components and technologies associated with electric and hybrid vehicles. (L2)

UNIT – 3

Power Plants – Working Principle of Steam, Diesel, Hydro, Nuclear Power Plants.
Mechanical Power Transmission - Belt Drives, Chain, Rope drives, Gear Drives and their applications.

Introduction to Robotics - Joints & Links, Configurations and Applications of Robotics.

Learning Outcomes:

At the end of this Unit, the Student will be able to:

- Describe the working principles of various power plants. (L1)
- List and identify different mechanical power transmission methods and provide examples of their practical applications. (L1)
- Understand and explain the basic components and configurations of robotic systems. (L2)

Textbooks:

1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India)Pvt. Ltd.
2. A Tear book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.
3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

Reference Books:

1. Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I
2. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
3. Thermal Engineering by Mahesh M Rathore Tata McGraw Hillpublications (India) Pvt.Ltd.
4. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, TataMcGraw Hill publications (India) Pvt. Ltd.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

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

3 0 0 3

(MA23ABS201) DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS
(Common to All Branches)

Course Objectives:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real world applications.

Course Outcomes:

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

CO1: Familiarize to solve the first and higher order differential equations (L3).

CO2: Apply the knowledge of linear differential equations related to various engineering fields (L3).

CO3: Identify solution methods for partial differential equations that model physical processes (L3).

CO4: Interpret the physical meaning of different operators such as gradient, curl and divergence (L5).

CO5: Evaluate the work done by force field, circulation and transformation between single, double and triple integrals using vector calculus (L5).

UNIT -1

Differential equations

Linear differential equations – Bernoulli's equations- Exact equations and equations reducible to exact form. Applications: Newton's Law of cooling – Law of natural growth and decay, Electrical circuits.

Learning Outcomes:

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

- Identify and solve the first order linear differential equations (L2)
- Solve the Engineering problems by using first order linear differential equations(L3)

UNIT -2

Linear differential equations of higher order

Definitions, homogenous and non-homogenous, complimentary function, general solution, particular integral, Wronskian, Method of variation of parameters. Simultaneous linear equations, Applications to L-C-R Circuit problems and Simple Harmonic motion.

Learning Outcomes:

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

- Identify and solve the higher order linear differential equations (L2)

- Solve the Engineering problems by using higher order linear differential equations(L3)

UNIT 3:

Partial Differential Equations

Introduction, Formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equations using Lagrange's method and non-linear (standard types) equations. Second order PDE: solution of linear PDE with constant coefficients- RHS term of the type by e^{ax+by} ,
$\sin(ax+by)$, $\cos(ax+by)$, $x^m y^n$.

Learning Outcomes:

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

- Formation of PDE by elimination (L3)
- Solve the first order linear partial differential equations with constant coefficients (L3)

UNIT-4

Vector differentiation

Scalar and vector point functions, vector operator Del, Del applies to scalar point functions, Gradient, Directional derivative, del applied to vector point functions- Divergence and Curl, vector identities.

Learning Outcomes:

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

- Illustrate the physical interpretation of Gradient, Divergence and Curl (L3)
- Apply del to Scalar and vector point functions (L3)

UNIT -5

Vector integration

Line integral-circulation-work done, surface integral-flux, Green's theorem in the plane (without proof), Stoke's theorem (without proof), volume integral, Divergence theorem (without proof) and related problems.

Learning Outcomes:

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

- Find the work done and circulation in moving a particle along the path over a force field (L1)
- Apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals(L3)

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, 44/e, Khanna publishers, 2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

Reference Books:

1. Dennis G. Zill and Warren S. Wright, Advanced Engineering Mathematics, Jones andBartlett,2011.
2. Michael Greenberg, Advanced Engineering Mathematics, 2/e, Pearson, 2018
3. George B.Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, PearsonPublishers, 2013.
4. R.K.Jain and S.R.K.Iyengar, Advanced Engineering Mathematics, 3/e, Alpha ScienceInternational Ltd., 2002.
5. B. V. Ramana, Higher Engineering Mathematics, McGraw Hill Education.
6. H. K Dass, Er. RajnishVerma, Higher Engineering Mathematics, S. Chand.
7. N. Bali, M.Goyal, C. Watkins, Advanced Engineering Mathematics, Infinity SciencePress.

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech – II Sem

L	T	P	C
3	0	0	3

(EE23APC201) ELECTRICAL CIRCUIT ANALYSIS-1
(EEE & allied branches)

Course Objectives:

To make the student learn about

- Basic characteristics of R, L, C parameters, their Voltage and Current Relations and network reduction techniques.
- Basic knowledge about the Magnetic circuits, electromagnetism, self and mutual inductances.
- The Single Phase AC circuits and concepts of real power, reactive power, complex power, phase angle and phase difference
- Study of Series and parallel resonances, bandwidth, current locus diagrams
- Network theorems and their applications

Course Outcomes:

CO1: Apply the knowledge of basic circuital laws and simplify the dc networks using reduction techniques.
CO2: Analyse magnetically coupled circuits and concept of inductance.
CO3: Evaluate the performance of given electrical circuit with AC excitation.
CO4: Understand the concept of Resonance, Locus diagrams for R-L, R-C and R-L-C
CO5: Apply the network theorems suitably to analyze complex circuits with DC and AC excitation

UNIT I INTRODUCTION TO ELECTRICAL CIRCUITS

Basic Concepts of passive elements of R, L, C and their V-I relations, Sources (dependent and independent), Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel, star-to-delta and delta-to-star transformation), source transformation technique, nodal analysis and mesh analysis to DC networks with dependent and independent voltage and current sources, node and mesh analysis.

UNIT II MAGNETIC CIRCUITS

Basic definition of MMF, flux and reluctance, analogy between electrical and magnetic circuits, Faraday's laws of electromagnetic induction – concept of self and mutual inductance, Dot convention – coefficient of coupling and composite magnetic circuit, analysis of series and parallel magnetic circuits.

UNIT III SINGLE PHASE CIRCUITS

Characteristics of periodic functions, Average value, R.M.S. value, form factor, representation of a sine function, concept of phasor, phasor diagrams, node and mesh analysis. Steady state analysis of R, L and C circuits to sinusoidal excitations-response of pure resistance, inductance, capacitance, series RL circuit, series RC circuit, series RLC circuit, parallel RL circuit, parallel RC circuit.

UNIT IV RESONANCE AND LOCUS DIAGRAMS

Series Resonance: Characteristics of a series resonant circuit, Q-factor, selectivity and bandwidth, expression for half power frequencies; Parallel resonance: Q-factor, selectivity and bandwidth; Locus diagram: RL, RC, RLC with R, L and C variables.

UNIT V NETWORK THEOREMS (DC & AC EXCITATIONS) Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum Power Transfer theorem, Reciprocity theorem, Millman's theorem and compensation theorem

Textbooks:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata Mc Graw Hill Education, 2005, sixth edition.
2. Network Analysis, M. E. Van Valkenburg, Pearson Education, 2019, Revised Third Edition

Reference Books:

1. Fundamentals of Electrical Circuits, Charles K. Alexander and Mathew N.O. Sadiku, Mc Graw Hill Education (India), 2013, Fifth Edition
2. Electric Circuits (Schaum's outline Series), Mahmood Nahvi, Joseph Edminister, and K. Rao, Mc Graw Hill Education, 2017, Fifth Edition.
3. Electric Circuits, David A. Bell, Oxford University Press, 2009, Seventh Edition.
4. Introductory Circuit Analysis, Robert L Boylestad, Pearson Publications, 2023, Fourteenth Edition.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, Seventh Revised Edition.

SRI VENKATESWARA COLLEGE OF ENGINEERING

(Autonomous)

B.Tech - II Sem

L	T	P	C
3	0	0	3

(CH23ABS101) CHEMISTRY

(Common to EEE, ECE, CSE, CSD, CSC, CSM & IT)

Course Objectives:

- To familiarize engineering chemistry and its applications.
- To train the students on the principles and applications of electrochemistry and polymers.
- To introduce instrumental methods.

Course Outcomes:

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

CO1: Understand Schrodinger Wave equation, MOT, energy level diagrams.

CO2: Apply the principle of Band diagrams in the application of conductors and semiconductors.

CO3: Compare the materials for construction of a battery and electrochemical sensors.

CO4: Explain the preparation, properties, and applications of thermoplastics & thermosetting & elastomers conducting polymers.

CO5: Explain the principles of spectrometry and separation of solid and liquid mixtures by chromatography.

UNIT - 1

Structure and Bonding Models (8 Hours)

Fundamentals of Quantum Mechanics-Plank's quantum theory, de-Broglie's hypothesis, Heisenberg uncertainty principle, Schrodinger Wave equation, significance of Ψ and Ψ^2, molecular orbital theory – bonding in homo- and hetero nuclear diatomic molecules – energy level diagrams of O_2 and CO, etc. π-molecular orbitals of butadiene and benzene, calculation of bond order.

UNIT - 2

Modern Engineering materials (9 Hours)

Crystal field theory, d- orbital's splitting in tetra hedral and octa hedral complexes, Semiconductors – Introduction, doping concept, application, Super Conductors-Introduction basic concept, applications. Super capacitors-: Introduction, Basic Concept-Classification – applications. Nano materials: Introduction, classification, properties and applications of Fullerenes, carbon Nano tubes and Graphenes.

UNIT - 3

Electrochemistry and Applications (11 Hours)

Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations).

Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples

Primary cells – Zinc-air battery, Secondary cells –lithium-ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogen-oxygen fuel cell– working of the cells. Polymer Electrolyte Membrane Fuel cells (PEMFC).

UNIT – 4

Polymer Chemistry (12 Hours)

Introduction to polymers, functionality of monomers, Tactility, chain growth and step growth polymerization, co- polymerization, with specific examples and mechanisms of polymer formation.

Plastics –Thermo and Thermosetting plastics, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6, 6.

Elastomers–Processing and vulcanization of natural rubber, Buna-S, Buna-N– preparation, properties and applications.

Conducting polymers – poly acetylene, poly aniline, – mechanism of conduction and applications. Bio-Degradable polymer - Poly Glycolic Acid (PGA).

UNIT – 5

Instrumental Methods and Applications (8 Hours)

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. UV- Visible Spectroscopy- electronic transition, Instrumentation and applications, IR spectroscopy- principle, Instrumentation and applications. Chromato graphy-Basic Principle, Classification-HPLC: Principle, Instrumentation and Applications.

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical.Chemistry,10/e, Oxford University Press, 2010.
3. Vogel's quantitative chemical analysis, 6th edition-2009.

Reference Books:

1. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson,2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications,Feb.2008
3. Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition
4. Chemistry Mc GrawHill, K.N.Jayaveera, G.V. Subba Reddy and C. Rama Chandraiah.

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech – II Sem **L T P C**
1 0 4 3

(ME23AES102) ENGINEERING GRAPHICS

(Common to All branches of Engineering**)**

Course Objectives:

The students after completing the course are expected to

- Enable with various concepts like dimensioning, conventions and standards related to engineering drawing
- Impart knowledge on the projection of points, lines and planesurfaces
- Improve the visualization skills for better understanding of projectionof solids
- Develop the imaginative skills required to understand section of solids and developments of surfaces.
- Draw the viewing perception of a solid object in isometric and orthographic projections.

Course Outcomes:

On completion of the course, the student should be able to

CO1: Draw various engineering curves, scales. (L3)

CO2: Draw and Interpret orthographic projections of points, lines, planes. (L3)

CO3: Draw the projection of solids in various positions. (L3)

CO4: Draw and Explore the sections of solids and development of surfaces. (L3)

CO5: Draw an isometric and orthographic views of simple solids. (L3)

UNIT – 1

Introduction to Engineering Drawing: Lines, Lettering and Dimensioning, Geometrical Constructions and Constructing Regular Polygons by General Methods.

Curves: Construction of Ellipse, Parabola and Hyperbola by General Method, Cycloids, Involutes, Normal and Tangent to Curves.

Scales: Plain Scales, Diagonal Scales and Vernier Scales.

Learning Outcomes:

On completion of the unit, the student will be able to:

- Comprehend the significance of engineering drawing. (L2)
- Identify and draw curves obtained in conic sections, cycloids, and involutes. (L3)
- Draw various engineering scales. (L3)

UNIT – 2

Orthographic Projections: Reference Plane, Importance of Reference Lines or

Plane, Projections of a Point Situated in any One of the Four Quadrants.

Projections of Straight Lines: Projections of Straight Lines Parallel to both Reference Planes, Perpendicular to One Reference Plane and Parallel to other Reference Plane, Inclined to one Reference Plane and Parallel to the other Reference Plane. Projections of Straight Line Inclined to both the Reference Planes.

Projections of Planes: Regular Planes Perpendicular to both Reference Planes, Parallel to One Reference Plane and Inclined to the other Reference Plane; Plane Inclined to both the Reference Planes.

Learning Outcomes:

At the end of this Unit, the Student will be able to

- Draw the projections of points & lines. (L3)
- Differentiate between projected length and true length and find the true length of the lines. (L2)
- Draw the projection of regular plane surfaces. (L3)

UNIT – 3

Projections of Solids: Types of Solids: Polyhedra and Solids of Revolution. Projections of Solids in Simple Positions: Axis Perpendicular to Horizontal Plane, Axis Perpendicular to Vertical Plane and Axis Parallel to both the Reference Planes, Projection of Solids with Axis Inclined to One Reference Plane and Parallel to another Plane, Projection of Solids Inclined to both the Reference Planes.

Learning Outcomes:

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

- Draw the projection of solids whose axis is parallel to both the reference planes. (L3)
- Draw the projection of solids inclined to one plane and both the planes. (L3)

UNIT – 4

Sections of Solids: Perpendicular and Inclined Section Planes, Sectional Views and True Shape of Section, Sections of Solids in Simple Position only.

Development of Surfaces: Methods of Development: Parallel Line Development and Radial Line Development. Development of a Cube, Prism, Cylinder, Pyramid and Cone.

Learning Outcomes:

At the end of this Unit, the Student will be able to

- Draw different sectional views of regular solids. (L3)
- Obtain the true shapes of the sections of prism, cylinder, pyramid and cone. (L4)
- Draw the sectional views of prism, cylinder, pyramid and cone. (L3)

UNIT – 5

Conversion of Views: Conversion of Isometric Views to Orthographic Views of Simple Solids; Conversion of Orthographic Views to Isometric views of Simple Solids.

Computer Graphics: Creating 2D&3D Drawings of Objects Including Domain

Specific Engineering Applications using Auto CAD (Not for end examination).

Learning Outcomes:

At the end of this Unit, the Student will be able to

- Draw Isometric views of simple solids. (L3)
- Draw Orthographic views of simple solids. (L3)
- Draw 2D&3D drawings of objects including domain specific engineering applications using Auto CAD. (L3)

Textbooks:

1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill,2013.
2. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 54th Edition,2023.

Reference Books:

1. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson EducationInc,2009.
2. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw-Hill, 2017.
3. Engineering Drawing and Graphics by K. Venugopal, 4/e, New Age Publishers, 2004.
4. Engineering Drawing by Basant Agarwal & C.M. Agarwal, 2/e, TataMcGraw-Hill, 2013

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech – II Sem **L T P C**

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ELECTRICAL CIRCUITS LAB
(EEE & allied branches)

Course Objectives:

- To impart hands on experience in verification of circuit laws and network reduction techniques.
- To impart hands on experience in verification of theorems
- To gain the knowledge about measurement of circuit parameters
- To know the concept of resonance and locus diagrams.
- To gain practical exposure to the usage of different circuits with different conditions.

Course Outcomes:

CO1: Understand the concepts of network theorems, node and mesh networks, series and parallel resonance and Locus diagrams.
CO2: Apply various theorems to compare practical results obtained with theoretical calculations.
CO3: Determine self, mutual inductances and coefficient of coupling values, parameters of choke coil.
CO4: Analyse different circuit characteristics with the help of fundamental laws and various configurations.
CO5: Create locus diagrams of RL, RC series circuits and examine series and parallel resonance.

List of Experiments:

1. Verification of Kirchhoff's circuit laws.
2. Verification of node and mesh analysis.
3. Verification of network reduction techniques.
4. Determination of cold and hot resistance of an electric lamp
5. Determination of Parameters of a choke coil.
6. Determination of self, mutual inductances, and coefficient of coupling
7. Series and parallel resonance
8. Locus diagrams of R-L (L Variable) and R-C (C Variable) series circuits
9. Verification of Superposition theorem
10. Verification of Thevenin’s and Norton’s Theorems
11. Verification of Maximum power transfer theorem
12. Verification of Compensation theorem
13. Verification of Reciprocity and Millman’s Theorems

Note: **Minimum of 10 experiments should be performed**

Reference Books:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata Mc Graw Hill Education, 2005, sixth edition.
2. Network Analysis, M. E. Van Valkenburg, Pearson Education, 2019, Revised Third

Edition

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech - II Sem

L	T	P	C
0	0	2	1

(CH23ABS102) CHEMISTRY LAB
(Common to EEE, ECE, CSE, CSD, CSC, CSM & IT)

Course Objectives:

Verify the fundamental concepts with experiments.

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

CO1: To verify Beer Lambert's law.

CO2: To analyse the IR and NMR spectra of some organic compounds.

CO3: To apply electro analytical techniques foe sample analysis. **CO4:** To measure the strength of an acid present in the samples. **CO5:** To prepare advanced polymer materials.

List of Experiments:

1. Measurement of 10Dq by spectrophotometric method
2. Conductometric titration of strong acid vs. strong base
3. Conductometric titration of weak acid vs. strong base
4. Determination of cell constant and conductance of solutions
5. Potentiometry - determination of redox potentials and emfs
6. Determination of Strength of an acid in Pb-Acid battery
7. Preparation of Bakelite
8. Verify Lambert-Beer's law
9. Wavelength measurement of sample through UV-Visible Spectroscopy
10. Identification of simple organic compounds by IR
11. Preparation of nanomaterials by precipitation method
12. Estimation of Ferrous Iron by Dichrometry

Reference:

- "Vogel's Quantitative Chemical Analysis 6th Edition 6th Edition" Pearson

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B.Tech – II Sem

L	T	P	C
0	0	3	1.5

(ME23AES103) ENGINEERING WORKSHOP

(Common to All Branches**)**

Course Objectives:

The students after completing the course are expected to

- Identify and explain safety practices and precautions relevant to workshop activities.
- Recognize and differentiate various types of woods and tools usedin woodwork.
- Demonstrate the ability to create different wood joints, including half-lap, mortise and tenon, and dovetail joints.
- Familiarize students with sheet metal working tools and techniques.
- Enable students to develop sheet metal projects such as taperedtrays, conical funnels, elbow pipes and brazing.

1. **Demonstration**: Safety Practices and Precautions to be Observed in the Workshop.
2. **Wood Working:** Familiarity with Different Types of Woods and Tools used in Wood Working and Making Following Joints.
   a) Half – Lap Joint
   b) Mortise and Tenon Joint
   c) Corner Dovetail Joint or Bridle Joint
3. **Sheet Metal Working**: Familiarity with Different Types of Tools used in Sheet Metal Working, Developments of Following Sheet Metal Job from GI Sheets.
   a) Tapered Tray
   b) Conical Funnel
   c) Elbow Pipe
   d) Brazing
4. **Fitting:** Familiarity with Different Types of Tools used in Fittingand do the Following Fitting Exercises.
   a) V-Fit
   b) Dovetail Fit
   c) Semi-Circular Fit
   d) Bicycle Tire Puncture and Change of Two-Wheeler Tyre
5. **Electrical Wiring**: Familiarity with Different Types of Basic Electrical Circuits and make the Following Connections.
   a) Parallel and Series
   b) Two-Way Switch
   c) Godown Lighting
   d) Tube Light
   e) Three Phase Motor

f) Soldering of Wires

6. **Foundry Trade:** Demonstration and Practice on Moulding Tools and Processes, Preparation of Green Sand Moulds for Given Patterns.
7. **Welding Shop:** Demonstration and Practice on Arc Welding and Gas Welding. Preparation of Lap Joint and Butt Joint.
8. **Plumbing:** Demonstration and Practice of Plumbing Tools, Preparation of Pipe Joints with Coupling for Same Diameter and with Reducer for Different Diameters.

Textbooks:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge Publishers, 5th Edn. 2015.
2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai, 2007, 14th edition.
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22.

Course Outcomes:

Students will be able to

- **Fabricate** sheet metal components manually.
- **Construct** wood joints such as half-lap, mortise, and tenon.
- **Assemble** the components to create joints like a V-fit.
- **Demonstrate** the plumbing, welding, foundry, and fitting jobs to form the components.
- **Connect & Check** the basic house wiring circuit connections for various applications.

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B.Tech – II Sem

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0	0	2	1

(CS23AES103) IT WORKSHOP LAB

(Common to All branches of Engineering)Course Objectives:

- To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables
- To teach basic command line interface commands on Linux.
- To teach the usage of Internet for productivity and self-paced life-longlearning
- To introduce Compression, Multimedia and Antivirus tools and OfficeTools such as Word processors, Spread sheets and Presentation tools.

Course Outcomes:

CO1: Perform Hardware troubleshooting.

CO2: Understand Hardware components and inter dependencies.

CO3: Safeguard computer systems from viruses/worms.

CO4: Document/ Presentation preparation.

CO5: Perform calculations using spreadsheets.

Hardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheraland submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Internet & World Wide Web

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to theinstructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be givento the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

ask 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on theinternet. They need to customize their browsers to block pop ups, block activex downloads to avoid viruses and/or worms.

LaTeX and WORD

Task 1 – Word Orientation: The mentor needs to give an overview of La TeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of La TeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using La TeXand word
– Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using La TeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both La TeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Excel

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2: Calculating GPA - Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean andlogical operators, Conditional formatting

Power point

Task 1: Students will be working on basic power point utilities and toolswhich help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrowsin PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art,Audio, Video, Objects, Tables and Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

AI Tools – ChatGPT

Task 1: Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences
to see how the model completes them.

- Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of France?"

Task 2: Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas

- Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards. Write a story about how society adapted to this newreality."

Task 3: Code Generation: Test the model's ability to generate code by giving it partial code snippets and asking it to complete them. You can also ask the model to explain programming concepts or help you debug code.
Ex:Prompt: "Complete the following Python code to swap the values of two variables:\npython\na = 5\nb = 10\ntemp = a\na = b\nb =temp\n"

Task 4: Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it intoanother language. Compare the output to see how accurate and fluent the translations are.

- Ex:Prompt: "Translate the following English sentence to French: 'Hello, how are you doing today?'"

Task 5: Summarization: Provide a long piece of text, such as an article or a blog post, and ask the model to summarize it. Compare the model's summary with the original text to assess its ability to condense information effectively.
Ex: Prompt: "Summarize the article titled ‘Ramayanam' in 3-4 sentences."

Task 6: Futuristic Predictions: Have fun by asking the model to predict future technological advancements, societal changes, or even hypothetical scenarios. Compare its responses with your own ideas.
Ex: Prompt: "Predict how artificial intelligence will transform everyday life in the next 20 years."

Task 7: Technical Explanations: Challenge the model with technical questions from different domains. Ask it to explain scientific concepts, mathematical theorems, or complex algorithms in simple terms.

- Ex: Prompt: "Explain the concept of neural networks in machine learning, including their layers and the process of backpropagation."

Reference Books:

1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
2. The Complete Computer upgrade and repair book, 3rd edition Cheryl A chmidt, WILEY Dream tech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware - A Handbook – Kate J. Chase PHI (Microsoft)
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. IT Essentials PC Hardware and Software Companion Guide Third Edition byDavid Anfins on and Ken Quamme. – CISCO Press, Pearson Education.
7. IT Essentials PC Hardware and Software Labs and Study Guide Third Edition by Patrick Regan– CISCO Press, Pearson Education.

SRI VENKATESWARA COLLEGE OF ENGINEERING

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B.Tech - II Sem

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(CH23ABS106) NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

(Common to All branches of Engineering)

Course Objectives:

The objective of introducing this course is to impart discipline, character, fraternity, teamwork, social consciousness among the students and engaging them in selfless service.

Course Outcomes:

After completion of the course the students will be able to

CO1: Understand the importance of discipline, character and service motto.

CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.

CO3: Explore human relationships by analyzing social problems.

CO4: Determine to extend their help for the fellow beings and downtrodden people.

CO5: Develop leadership skills and civic responsibilities.

UNIT - 1

Orientation

General Orientation on NSS/NCC/ Scouts & Guides/Community Service activities, career guidance.

Activities:

i) Conducting –ice breaking sessions-expectations from the course- knowing personal talents and skills
ii) Conducting orientations programs for the students –future plans- activities-releasing road map etc.
iii) Displaying success stories-motivational biopics- award winning movies on societal issues etc.
iv) Conducting talent show in singing patriotic songs-paintings- any other contribution.

UNIT - 2

Nature & Care

Activities:

i) Best out of waste competition.
ii) Poster and signs making competition to spread environmentalawareness.
iii) Recycling and environmental pollution article writing competition.
iv) Organising Zero-waste day.
v) Digital Environmental awareness activity via various social mediaplatforms.

vi) Virtual demonstration of different eco-friendly approaches forsustainable living.
vii) Write a summary on any book related to environmental issues.

UNIT III

Community Service

Activities:

i) Conducting One Day Special Camp in a village contacting village-area leaders- Survey in the village, identification of problems- helping them to solve via media- authorities experts-etc.
ii) Conducting awareness programs on Health-related issues such as General Health, Mental health, Spiritual Health, HIV/AIDS,
iii) Conducting consumer Awareness. Explaining various legal provisions etc.
iv) Women Empowerment Programmes- Sexual Abuse, Adolescent Health and Population Education.
v) Any other programmes in collaboration with local charities, NGOs etc.

Reference Books:

1 Nirmalya Kumar Sinha & Surajit Majumder, A Text Book of National Service Scheme Vol;.I, Vidya Kutir Publication, 2021 (ISBN 978-81- 952368-8-6)
2 Red Book - National Cadet Corps – Standing Instructions Vol I & II, Directorate General of NCC, Ministry of Defence, New Delhi
3 Davis M. L. and Cornwell D. A., "Introduction to Environmental Engineering", McGraw Hill, New York 4/e 2008
4 Masters G. M., Joseph K. and Nagendran R. "Introduction to Environmental Engineering and Science", Pearson Education, New Delhi. 2/e 2007 5. Ram Ahuja. Social Problems in India, Rawat Publications, New Delhi.

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities.
2. Institutes are required to provide instructor to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A Student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totalling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.