JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
COLLEGE OF ENGINEERING (AUTONOMOUS)
KALIKIRI-517234, ANNAMAYYA (Dt)., A.P., INDIA.
B.TECH.-CIVIL ENGINEERING

I YEAR COURSE STRUCTURE & SYLLABI

B. Tech I Year-I Semester						
S. No.	**Category**	**Title**	**L/D**	**T**	**P**	**Credits**
1	23ABS01T	Engineering Physics	3	0	0	3
2	23ABS05	Linear Algebra & Calculus	3	0	0	3
3	23ABEE01	Basic Electrical & Electronics Engineering	3	0	0	3
4	23AME01	Engineering Graphics	1	0	4	3
5	23ACS01	Introduction to Programming	3	0	0	3
6	23ACS03	IT Workshop	0	0	2	1
7	23ABS01P	Engineering Physics Lab	0	0	2	1
8	23ABEE02	Electrical & Electronics Engineering Workshop	0	0	3	1.5
9	23ACS02	Computer Programming Lab	0	0	3	1.5
10	23AHSS2	NSS/NCC/Scouts & Guides/Community Service	0	0	1	0.5
Total			**13**	**0**	**15**	**20.5**
B. Tech I Year-II Semester						
1	23AHS01T	Communicative English	2	0	0	2
2	23ABS04	Engineering Chemistry / Chemistry / Fundamental Chemistry	3	0	0	3
3	23ABS06	Differential Equations & Vector Calculus	3	0	0	3
4	23ACME01	Basic Civil & Mechanical Engineering	3	0	0	3
5	23AME03	Engineering Mechanics	3	0	0	3
6	23AHS01P	Communicative English Lab	0	0	2	1
7	23ABS04P	Engineering Chemistry / Chemistry / Fundamental Chemistry Lab	0	0	2	1
8	23AME02	Engineering Workshop	0	0	3	1.5
9	23ACME02	Engineering Mechanics & Building Practices Lab	0	0	3	1.5
10	23AHSS1	Health and wellness, Yoga and Sports	0	0	1	0.5
Total			**14**	**0**	**11**	**19.5**

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Course Code	ENGINEERING PHYSICS (Common to all Branches)	L	T	P	C
23ABS01T		3	0	0	3
Semester	**I B. Tech I Sem (CE,ME & ECE) I B. Tech II Sem (EEE,CSE & FT)**				

Course Objectives:

To bridge the gap between the physics in previous and present UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction polarisation, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics with free electron theory, introduce novel-concepts of dielectric and magnetic materials along with physics of semiconductors.

Course Outcomes (CO): Student will be able to

CO1: Analyse the intensity variation of light due to polarization, interference and diffraction. (L2, L3, L4)
CO2: Familiarize with the basics of crystals and their structure identification. (L2, L3, L4)
CO3: Summarize various types of polarization of dielectrics and classify the magnetic materials**.** (L2, L3)
CO4: Explain the fundamentals of quantum mechanics and identify the application of quantum mechanics and the role of free electron theory in understanding the electrical conductivity in metals**.** (L2)
CO5: Identify the type of semiconductor using Hall effect (L2)

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 - complex dielectric constant – 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.

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 crystalline solids - Intrinsic semiconductors: Density of charge carriers – Electrical conductivity - Fermi level – Extrinsic semiconductors: density of charge carriers – dependence of Fermi energy on carrier concentration and temperature - Drift and diffusion currents – Einstein's equation – Hall effect and its applications.

Learning Resources:

Textbooks:

1. A Text book of Engineering Physics, M. N. Avadhanulu, P.G.Kshirsagar& TVS Arun Murthy, 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, Cengage Learning 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 international publishers (2009).

Web Resources:

https://www.loc.gov/rr/scitech/selected-internet/physics.html

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Course Code	**LINEAR ALGEBRA & CALCULUS**	**L**	**T**	**P**	**C**
23ABS05		**3**	**0**	**0**	**3**
Semester	**I B. Tech I Semester Common to CE, EEE, ME, CSE & ECE**				

Course Objectives:

- 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 (CO): Student will be able to

CO1: Demonstrate the solutions of the system of linear equations.
CO2: Find the Eigen values and Eigen vectors of a matrix, apply Cayley-Hamilton theorem to determine inverse and power of a matrix and identify the nature of quadratic form.
CO3: Utilize mean value theorems of differential calculus to real life problems.
CO4: Familiarize with functions of several variables which are useful in optimization.
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.

Pre-requisite:	The basic knowledge of Matrices, Differentiation and Integration.

Unit - I	**MATRICES AND SOLUTION OF SYSTEM OF EQUATIONS**

Rank of a matrix by echelon form, normal form. Inverse of a non- singular matrix by Gauss-Jordan method, System of linear equations: Solvingsystem of Homogeneous and Non-Homogeneous equations by Gauss elimination method.
Iterative Methods: Gauss Jacobi and Gauss Seidel Iteration Methods.

Unit - II	**EIGENVALUES, EIGENVECTORS AND QUADRATIC FORMS**

Eigenvalues, Eigenvectors of Real matrices and their properties - Cayley-HamiltonTheorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem,Diagonalization of a matrix - Quadratic forms and nature of the quadratic forms, Reduction of Quadratic form to canonicalforms by orthogonal transformation.

Unit - III	**MEAN VALUE THEOREMS (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.

Unit - IV	**PARTIAL DIFFERENTIATION AND APPLICATIONS (MULTI VARIABLE CALCULUS)**

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

Unit - V	**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

and triple integrals.

Learning Resources:

Textbooks:

1. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, 2017, 44th Edition
2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 2018, 10thEdition

Reference Books:

1. Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
2. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Alpha Science International Ltd., 2021 5th Edition (9th reprint).
3. Advanced Modern Engineering Mathematics, Glyn James, Pearson publishers, 2018, 5thEdition.
4. Advanced Engineering Mathematics, Micheael Greenberg, Pearson publishers, 9th edition
5. Higher Engineering Mathematics, H. K Das, Er. Rajnish Verma, S. Chand Publications, 2014, Third Edition (Reprint 2021.

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Course Code		L	T	P	C
23ABEE01	**Basic Electrical & Electronics Engineering** **Part A: Basic Electrical Engineering** **(Common to All Branches)**	**3**	**0**	**0**	**3**
Semester	**I B. Tech I Semester** (CE,ME& ECE) **& II Semester** (EEE,CSE&FT)				

Course Objectives:

To expose to the field of electrical engineering, laws and principles of electrical engineering and to acquire fundamental knowledge in the relevant field.

Course Outcomes (CO): Student will be able to

CO1: Remember the fundamental laws, operating principles of motors, generators, MC and MI instruments (L1).
CO2: Understand the problem solving concepts associated to AC and DC circuits, construction and operation of AC and DC machines, measuring instruments; different power generation mechanisms, Electricity billing concept and important safety measures related to electrical operations (L2).
CO3: Apply mathematical tools and fundamental concepts to derive various equations related to machines, circuits and measuring instruments; electricity bill calculations and layout representation of electrical power systems (L3).
CO4: Analyze different electrical circuits, performance of machines and measuring instruments (L4).
CO5: Evaluate different circuit configurations, Machine performance and Power systems operation (L5).

Unit - I **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, Analysis of R-L, R-C, R-L-C Series circuits, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).

Unit - II **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 - III **ENERGY RESOURCES, ELECTRICITY BILL & SAFETY MEASURES**

Energy Resources: Conventional and non-conventional energy resources; Layout and operation of 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.
Equipment Safety Measures: Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.

Learning Resources:

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, Oxford University Press, 2017
4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076

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Course Code	Basic Electrical & Electronics Engineering PART: B Basic Electronics Engineering (Common to All Branches)	L	T	P	C
23ABEE01		3	0	0	3
Semester	**I B. Tech I Semester** (CE,ME& ECE) **& II Semester** (EEE,CSE&FT)				

Course Objectives:

This course provides the student with the fundamental skills to understand the principles of digital electronics, basics of semiconductor devices like diodes & transistors, characteristics and its applications.

Course Outcomes (CO): Student will be able to

CO1: Apply the concept of science and mathematics to understand the working of diodes, transistors, and their applications.
CO2: Explain the characteristics of diodes and transistors.
CO3: Familiarize with the number systems, codes, Boolean algebra and logic gates.
C04: Understand the working mechanism of different combinational, sequential circuits and their role in the digital systems.

Unit - I	**SEMICONDUCTOR DEVICES**

Introduction - Evolution of electronics – Vacuum tubes to nano 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 - II	**BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION**

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, Concept of voltage divider basing. Electronic Instrumentation: Block diagram of an electronic instrumentation system.

Unit - III	**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)

Learning Resources:

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:

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

Web Resources:

1. https://nptel.ac.in/courses/108105053
2. https://nptel.ac.in/courses/108108076

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B.TECH-CIVIL ENGINEERING

Course Code	ENGINEERING GRAPHICS (Common to All Branches)	L	T	P	C
23AME01		1	0	4	3
Semester	**I B. Tech I Semester**				

Course Objectives:

- To enable the students with various concepts like dimensioning, conventions and standards related to Engineering Drawing.
- To impart knowledge on the projection of points, lines, and plane surfaces.
- To improve the visualization for better understanding of projection of solids.
- To develop the imaginative skills of the e required to understand Section of solids and Developments of surfaces
- To make the students understand the viewing perception of a solid object in Isometric and Perspective projections.

Course Outcomes (CO): Student will be able to

CO1: Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections.
CO2: Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views.
CO3: Understand and draw projection of solids in various positions in first quadrant.
CO4: Explain principles behind development of surfaces.
CO5: Prepare isometric and perspective sections of simple solids.

Unit - I

Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions and Constructing regular polygons by general meth6ds.
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.

Unit - II

Orthographic Projections: Reference plane, importance of reference lines or Plane, of a point situated in 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

Unit - III

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.

Unit - IV

Sections of Solids: perpendicular and inclined section planes, sectional views and True shape of section, Sections of solid in simple position only.
Development Surfaces: Methods of development parallel line development and radial line development. Development of a cube, prism, cylinder, pyramid and cone.

Unit - V	
Conversion of Views: Conversion of orthographic views to isometric views. conversion of isometric views to orthographic views. **Computer Graphics:** Creating 2D and 3D drawings of objects including PCB and Transformations using Auto CAD (Not for end examinations).	
Learning Resources:	
Textbooks: 1. N.D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016 2. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill,2013. 3. Engineering Drawing by P.S. Gill, S.K. Kataria and Sons Publishers 4. Engineering Drawing+Auto CAD, by K. Venugopal, V. Prabhu Raja, New Age International Publishers	
Reference Books: 1. Engineering Drawing M.B. Shah and B.C. Rana, Pearson Education Inc, 2009. 2. Engineering Drawing with an Introduction to AutoCAD, Dhananjay, Jolhe, Tata McGraw Hill,2017	
Web Resources:	

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Course Code		L	T	P	C
23ACS01	**INTRODUCTION TO PROGRAMMING (Common to All Branches)**	**3**	**0**	**0**	**3**
Semester	**I B. Tech I Semester**				

Course Objectives: The main objective of the course is to

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects.

Course Outcomes (CO): After completion of the course, students will be able to

CO1: Understand basics of computers, the concept of algorithm and algorithmic thinking.
CO2: Analyse a problem and develop an algorithm to solve it.
CO3: Implement various algorithms using the C programming language.
CO4: Understand more advanced features of C language.
CO5: Develop problem-solving skills and the ability to debug and optimize the code.

Unit - I	**Introduction to Programming and Problem Solving**

History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter, Introduction to Programming Languages, Basics of a Computer Program- Algorithms, flowcharts (Using Dia Tool), pseudo code. Introduction to Compilation and Execution, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operations, Type Conversion, and Casting.

Problem solving techniques: Algorithmic approach, characteristics of algorithm, Problem solving strategies: Top-down approach, Bottom-up approach, Time and space complexities of algorithms.

Unit - II	**Control Structures**

Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, do-while) Break and Continue.

Unit - III	**Arrays and Strings**

Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings.

Unit - IV	**Pointers & User Defined Data types**

Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers, User-defined data types-Structures and Unions.

Unit - V	**Functions & File Handling**

Introduction to Functions, Function Declaration and Definition, Function call Return Types and Arguments, modifying parameters inside functions using pointers, arrays as parameters. Scope and Lifetime of Variables, Basics of File Handling.

Note: The syllabus is designed with C Language as the fundamental language of implementation.

Learning Resources:
Textbooks: 1. "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, PrenticeHall, 1988 2. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996
Reference Books: 1. Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008. 2. Programming in C, Rema Theraja, Oxford, 2016, 2 nd edition 3. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3 rd edition
Web Resources:

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Course Code	IT WORKSHOP (Common to all branches of Engineering)	L	T	P	C
23ACS03		0	0	2	1
Semester	**I B. Tech I Sem**				

Course Objectives: The main objective of the course is to

- To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables
- To demonstrate configuring the system as Dual boot both Windows and other Operating Systems Viz. Linux, BOSS
- To teach basic command line interface commands on Linux.
- To teach the usage of Internet for productivity and self-paced life-long learning
- To introduce Compression, Multimedia and Antivirus tools and Office Tools such as Word processors, spread sheets and Presentation tools.

Course Outcomes (CO): After completion of the course, students will be able to

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.

List of Experiments:

PC Hardware & Software Installation
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 peripheral and 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 (VMWare) with both
Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task 5: Every student should install BOSS on the computer. The system should be configured as dual boot (VMWare) with both Windows and BOSS. 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 the instructor, 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 given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 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 the internet. They need to customize their browsers to block pop ups, block active x 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 and logical operators, Conditional formatting

POWER POINT

Task 1: Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in 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 new reality."

Task 3: Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another 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?'"

Reference Books:

1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003
2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech, 2013, 3rd edition
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education, 2012, 2nd edition
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, David Anfins on and Ken Quamme. – CISCO Press, Pearson Education, 3rd edition
7. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3rd edition

Web Resources:

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B.TECH.-CIVIL ENGINEERING

Course Code		L	T	P	C
23ABS01P	**ENGINEERING PHYSICS LAB** (Common to all Branches Of Engineering)	**0**	**0**	**2**	**1**
Semester	**I B. Tech I Sem (CE, ME & ECE) I B. Tech II Semester (EEE, CSE & FT)**				

Course Objectives:

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

Course Outcomes (CO): Student will be able to

CO1: Operate optical instruments like travelling microscope and spectrometer. (L5)
CO2: Estimate the wavelengths of different colours using diffraction grating. (L5)
CO3: Estimate hall coefficient of a given semiconductor. (L5)
CO4: Evaluate dielectric constant for dielectric and plot B H curve of ferro magnetic material respectively.(L5)
CO5: Calculate the band gap of a given semiconductor. (L5)

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. Verification of Brewster's law
4. Determination of dielectric constant using charging and discharging method.
5. Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
6. Determination of wavelength of Laser light using diffraction grating.
7. Estimation of Planck's constant using photoelectric effect.
8. Determination of the resistivity of semiconductors by four probe methods.
9. Determination of energy gap of a semiconductor using p-n junction diode.
10. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
11. Determination of Hall voltage and Hall coefficient of a given semiconductor using Hall Effect.
12. Determination of temperature coefficients of a thermistor.
13. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
14. Determination of magnetic susceptibility by Kundt's tube method.
15. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
16. Sonometer: Verification of laws of stretched string.
17. Determination of young's modulus for the given material of wooden scale by non-uniform bending (or double cantilever) method.
18. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.

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

Learning Resources:

References Books:

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

Web Resources:

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

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B.TECH.-CIVIL ENGINEERING

Course Code	Electrical & Electronics Engineering Workshop Part A: Basic Electrical Engineering (Common to All Branches)	L	T	P	C
23ABEE02		0	0	3	1.5
Semester	**I B. Tech I Semester** (CE,ME& ECE) **& II Semester** (EEE,CSE&FT)				

Course Objectives:

To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

Course Outcomes (CO): By the end of the course, the student will be able to:

CO1: Understand the Electrical circuit design concept; measurement of resistance, power, power factor; concept of wiring and operation of Electrical Machines and Transformer (L2)
CO2: Apply the theoretical concepts and operating principles to derive mathematical models for circuits, Electrical machines and measuring instruments; calculations for the measurement of resistance, power and power factor (L3)
CO3: Apply the theoretical concepts to obtain calculations for the measurement of resistance, power and power factor (L3)
CO4: Analyze various characteristics of electrical circuits, electrical machines and measuring instruments (L4)
CO5: Design suitable circuits and methodologies for the measurement of various electrical parameters; Household and commercial wiring (L5)

List of Experiments:

All the following ten experiments are required to be conducted

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

Learning Resources:

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

Web Resources:

http://vlabs.iitkgp.ernet.in/asnm/index.html
https://vlab.amrita.edu/?sub=1&brch=75

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B.TECH.-CIVIL ENGINEERING

Course Code	Electrical & Electronics Engineering Workshop PART: B Basic Electronics Engineering (Common to All Branches)	L	T	P	C
23ABEE02		0	0	3	1.5
Semester	**I B. Tech I Semester** (CE,ME& ECE) **& II Semester** (EEE,CSE&FT)				

Course Objectives:

To impart knowledge on the principles of digital electronics and fundamentals of electron devices& its applications.

Course Outcomes:

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

CO1: Identify & testing of various electronic components.

CO2: Understand the usage of electronic measuring instruments. CO3: Plot and discuss the characteristics of various electron devices. CO4: Explain the operation of a digital circuit.

List of Experiments:

Plot V-I characteristics of PN Junction Diode A) Forward bias B) Reverse bias.

Plot V – I characteristics of Zener Diode and its application as voltage Regulator.

Implementation of half wave and full wave rectifiers

Plot Input & Output characteristics of BJT in CE and CB configurations

Frequency response of CE amplifier.

Simulation of RC coupled amplifier with the design supplied

Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.

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.

Learning Resources:

References:

R. L. Boylestad& Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.

R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

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 Hardware / Software.

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B.TECH.-CIVIL ENGINEERING

Course Code	COMPUTER PROGRAMMING LAB (Common to All branches of Engineering)	L	T	P	C
23ACS02		0	0	3	1.5
Semester	**I Year B.Tech. – I Semester**				

Course Objectives: The main objective of the course is to

The course aims to give students hands – on experience and train them on the concepts of the C- programming language

Course Outcomes: After completion of the course, students will 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 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.
Suggested Experiments/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.

Suggested Experiments /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.
Suggested Experiments/Activities:
Tutorial 3: Variable types and type conversions:

Lab 3: Simple computational problems using arithmetic expressions.

i) Finding the square root of a given number
ii) Finding compound interest

iii) Area of a triangle using heron's formulae
iv) Distance travelled by an object

Unit - II

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.

Suggested Experiments/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, nullelse, 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.

Suggested Experiments/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 number is a prime or not.
iii) Compute sine and cos series
iv) Checking a number palindrome
v) Construct a pyramid of numbers.

Unit - III

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.

Suggested Experiments/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 on1D array.
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.

Suggested Experiments/Activities:
Tutorial 8: 2 D arrays, sorting and Strings.
Lab 8: Matrix problems, String operations, Bubble sort

i) Addition of two matrices
ii) Multiplication of 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

Unit - IV

WEEK 9:
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 9: Pointers, structures and dynamic memory allocation
Lab 9: 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 10:
Objective: Experiment with C Structures, Unions, bit fields and self-referential structures (Singly linked lists) and nested structures

Suggested Experiments/Activities:
Tutorial 10: Bitfields, Self-Referential Structures, Linked lists
Lab10 : Bitfields, linked lists
Read and print a date using dd/mm/yyyy format using bit-fields and differentiate the same without using bit-fields

i) Create and display a singly linked list using self-referential structure.

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

Unit - V

WEEK 11:
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

Suggested Experiments/Activities:
Tutorial 11: Functions, call by value, scope and extent,
Lab 11: 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 to transpose of a matrix.
iv) Write a C function to demonstrate numerical integration of differential equations using Euler's method

WEEK 12:
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.

Suggested Experiments/Activities:
Tutorial 12: Recursion, the structure of recursive calls
Lab 12: 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 a recursive 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 13:
Objective: Explore the basic difference between normal and pointer variables, Arithmetic operations using pointers and passing variables to functions using pointers

Suggested Experiments/Activities:
Tutorial 13: Call by reference, dangling pointers
Lab 13: 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.
siv) Write a C program to find no of lowercase, uppercase, digits and other characters using pointers.

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

Suggested Experiments/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.
Learning Resources:
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

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B.TECH.-CIVIL ENGINEERING

Course Code		**L**	**T**	**P**	**C**
23AHSS2	**NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE** (Common to all Branches)	**0**	**0**	**1**	**0.5**
Semester	**I B. Tech I Sem (CE, ME & ECE) I B. Tech II Sem (EEE, CSE & FT)**				
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 (CO): Student 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 I	**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 andskills
ii) Conducting orientation programs for the students –future plans-activities-releasing road mapetc.
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 II	**Nature & Care**

Activities:

i) Best out of waste competition.
ii) Poster and signs making competition to spread environmental awareness.
iii) Recycling and environmental pollution article writing competition.
iv) Organising Zero-waste day.
v) Digital Environmental awareness activity via various social media platforms.
vi) Virtual demonstration of different eco-friendly approaches for sustainable 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:

Institutes must assign slots in the Timetable for the activities.
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, 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.-CIVIL ENGINEERING

Course Code		**L**	**T**	**P**	**C**
23AHS01T	**COMMUNICATIVE ENGLISH** (Common to all Branches)	**2**	**0**	**0**	**2**
Semester	**I B. Tech II Sem**				

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 (CO): Student will be able to

CO1: Understand the context, topic, and pieces of specific information from social or transactional dialogues.
CO2: Apply grammatical structures to formulate sentences and correct word forms.
CO3: Analyze discourse markers to speak clearly on a specific topic in informal discussions.
CO4: Evaluate reading/listening texts and to write summaries based on global comprehension of these texts.
CO5: Create a coherent paragraph, essay, and resume.

UNIT I	**Lesson: HUMAN VALUES: Gift of 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 of Writing-Capitalization, Spellings, Punctuation-Parts of Sentences.
Grammar:	Parts of Speech, Basic Sentence Structures-Forming questions
Vocabulary:	Synonyms, Antonyms, Affixes (Prefixes/Suffixes), Root words.

UNIT II	**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 structured 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 III	**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 is discussed
Reading:	Reading a text in detail by making basic inferences -recognizing and interpretingspecific context clues; strategies to use text clues for comprehension.
Writing:	Summarizing, Note-making, paraphrasing
Grammar:	Verbs - tenses; subject-verb agreement;
Vocabulary:	Compound words, Collocations

UNIT IV	**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:	Academic Writing(Letter Writing, Report writing, creative writing, critical thinking)
Grammar:	Reporting verbs, Direct & Indirect speech, Active & Passive Voice
Vocabulary:	Words often confused, Jargons

UNIT V	**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.
Writing:	Writing structured essays on specific topics.
Grammar:	Editing short texts –identifying and correcting common errors in grammar andusage (articles, prepositions, tenses, subject verb agreement)
Vocabulary:	Technical Jargons

Learning Resources:

Textbooks:

1. Pathfinder: *Communicative English for Undergraduate Students*, 1st Edition, OrientBlack 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. CIVIL ENGINEERING

Course Code	**ENGINEERING CHEMISTRY**	**L**	**T**	**P**	**C**
23ABS04		**3**	**0**	**0**	**3**
Semester	**I B. Tech II Semester Civil, Mech**				

Course Objectives:

- To familiarize engineering chemistry and its applications
- To impart the concept of soft and hard waters, softening methods of hard water
- To train the students on the principles and applications of electrochemistry, polymers, Surface chemistry and cement.

Course Outcomes (CO): Student will be able to

CO1: Demonstrate the hardness, acidity and dissolved oxygen of water sample.
CO2: Demonstrate the corrosion prevention methods and factors affecting corrosion.
CO3: Explain the preparation, properties and applications of thermoplastics & Thermosetting, elastomers & conducting polymers.
CO4: Explain calorific values, octane number, refining of petroleum and cracking of oils.
CO5: Explain the setting and hardening of cement.
CO6: Summarize the concepts of colloids, micelle and nanomaterials.

Pre-requisite:	The basic knowledge of water, electrochemistry, polymers, fuels, cement and surface chemistry.

Unit - I	**Water Technology**

Soft and hardwater, Estimation of hardness of water by EDTA method, Estimation of dissolved oxygen – Boiler troubles – priming, foaming, scale and sludge, caustic embrittlement, Industrial water treatment – specifications for drinking water, Bureau of Indian Standards (BIS) and world health organization (WHO) standards, Ion-exchange processes – desalination of brackish water, reverse osmosis (RO) and electrodialysis.

Unit - II	**Electrochemistry and Applications**

Electrodes – electrochemical cell, Nernst equation, cell potential calculations.
Primary cells – Zinc-air battery, Secondary Cells - Nickel-Cadmium (NiCad), and lithium-ion batteries – working principle of the batteries including cell reactions; Fuel cells – Basic concepts, the principle and working of hydrogen-oxygen Fuel cell.
Corrosion: Introduction to corrosion, electrochemical theory of corrosion, differential aeration cell corrosion, galvanic corrosion, metal oxide formation by dry electrochemical corrosion, Pilling Bed worth ratios and uses, Factors affecting the corrosion, cathodic and anodic protection, electroplating and electroless plating (Nickle and Copper).

Unit - III	**Polymers and Fuel Chemistry**

Introduction to polymers, functionality of monomers, Mechanism of chain growth polymerization.

Thermoplastics and Thermosetting plastics: Preparation, properties and applications of polystyrene, PVC, Nylon 6, 6 and Bakelite.

Elastomers – Preparation, properties and applications of Buna S, Buna N, Thiokol rubbers. Fuels – Types of fuels, calorific value of fuels, numerical problems based on calorific value:

Analysis of coal (Proximate and Ultimate Analysis), Liquid fuels, refining of petroleum, Octane and Cetane number – alternative fuels – propane, methanol, ethanol and bio fuel-bio diesel.

Unit - IV	**Modern Engineering Materials**

Composites – Definition, Constituents, Classification – Particle, Fibre and Structural reinforced composites. Properties and Engineering applications.

Refractories- classification, Functions of lubricants, Mechanism, properties of lubricating oils – Viscosity, Viscosity Index, Flash point, Fire point, Cloud point, saponification and Applications.
Building Materials – Portland cement, constituents, Setting and Hardening of cement.

Unit - V	**Surface Chemistry and Nanomaterials**

Introduction to surface chemistry, colloids, Nano metals and Nano metal oxides, micelle formation, synthesis of colloids (Braggs Method), chemical and biological methods of preparation of nanometals and metal oxides, stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Langmuir), BET equation (no derivation) applications of colloids and nanomaterials-catalysis, medicine, sensors, etc.

Learning Resources:

Textbooks:

1. Jain and Jain, Engineering Chemistry, 17E, Dhanpat Rai, 2015.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10E, Oxford University Press, 2010.
3. GV Subba Reddy, K N Jayaveera, C Ramachandraiah, Engineering Chemistry, Mc Graw Hill, 2019.
4. Shikha Agarwal, Engineering Chemistry: Fundamentals and Applications, 2E, Cambridge University Press, 2019.

Reference Books:

6. Skoog and West, Principles of Instrumental Analysis, 6E, Thomson, 2007.
7. Douglas A. Skoog, F. James Holler, Stanley R. Crouch, Principles of Instrumental Analysis, 7E, Cengage, 2018.
8. D.J. Shaw, Introduction to colloids and Surface Chemistry, Butterworth-Heineman, 1992

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B. TECH. I Year II Semester

Course Code	**DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS**	**L**	**T**	**P**	**C**
23ABS06		**3**	**0**	**0**	**3**
Semester	**I B. Tech II Semester Common to CE, EEE, ME, ECE & CSE**				

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 theminto advanced level by handling various real-world applications.

Course Outcomes (CO): Student will be able to

CO1: Solve the differential equations related to various engineering fields.
CO2: Find the complete solution to the higher order linear differential equations and apply these methods to find the current in complex electrical circuits.
CO3: Identify solution methods for partial differential equations that model physical process.
CO4: Interpret the physical meaning of different operators such as gradient, curl and divergence.
CO5: Estimate the work done against a field, circulation and flux using vector calculus.

Pre-requisite:	Differential and Integral Calculus.

Unit - I	**DIFFERENTIAL EQUATIONS OF FIRST ORDER AND FIRST DEGREE**

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

Unit - II	**LINEAR DIFFERENTIAL EQUATIONS OF HIGHER ORDER (CONSTANT COEFFICIENTS)**

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

Unit - III	**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 e^{ax+by}, $\sin(ax+by)$, $\cos(ax+by)$, $x^m y^n$.

Unit - IV	**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, Scalar potential functions, Vector identities.

Unit - V	**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 Resources:

Textbooks:

i) Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers, 2017, 44th Edition
ii) Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 2018, 10thEdition

Reference Books:

9. Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
10. Advanced Engineering Mathematics, Dennis G. Zill and Warren S. Wright, Jones andBartlett, 2018.
11. Advanced Modern Engineering Mathematics, Glyn James, Pearson publishers, 2018,5th Edition.
12. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Alpha ScienceInternational Ltd., 2021 5th Edition (9th reprint).
13. Higher Engineering Mathematics, B. V. Ramana, , McGraw Hill Education, 2017

Web Resources:

1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. http://www.nptel.ac.in/course.php

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B.TECH.- CIVIL ENGINEERING

Course Code	BASIC CIVIL AND MECHANICAL ENGINEERING PART – A: BASIC CIVIL ENGINEERING	L	T	P	C
23ACME01		3	0	0	3
Semester	I B. Tech I Semester (Common to EEE, CSE & FT) & I B. Tech II Semester (Common to CIVIL, MECH & ECE)				

Course Objectives:

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduction to Basic Civil Engineering materials and construction techniques.
- Introduce the preliminary concepts of Structural and Geotechnical Engineering, surveying, Transportation Engineering and Environmental Engineering.
- Get familiarized with the importance of quality, conveyance and storage of water, quality of water and Waste water management.

Course Outcomes (CO): Student will be able to

CO1: Understand various sub-divisions of Civil Engineering and to escalate their role in ensuring better society.
CO2: Learn the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.
CO3: Know the importance of structures and soils and learn the concepts of surveying.
CO4: Realize the importance of Transportation in nation's economy and the Engineering measures related to Transportation.
CO5: Comprehend the importance of Water Storage, water quality and waste management for sustainable growth.

Unit - I	Introduction to Civil Engineering:

Role of Civil Engineers in Society- Various Disciplines of Civil Engineering- Structural Engineering Geotechnical Engineering- Transportation Engineering- Hydraulics and Water Resources Engineering - Environmental Engineering -Scope of each discipline.
Construction Materials: Cement, Aggregates, Bricks, Cement concrete, Steel-Building Construction and Planning-Introduction to Prefabricated Construction Techniques.

Unit - II	Structural and Geotechnical Engineering & Surveying and Transportation Engineering

Structural and Geotechnical Engineering: Introduction to types of Structures, Structural members and Structural Components- Various Forces acting on the structures Types of Soils and foundations - Types of rocks and minerals - Soil formation, Classification of soils- Concept of permeability and seepage.
Surveying and Transportation Engineering: Objectives of Surveying- Horizontal Measurements- Angular Measurements- Introduction to Bearings, levelling instruments used for levelling -Simple problems on levelling and Bearings-Concept of Contour mapping. Importance of Transportation in Nation's economic development- Types of Highway Pavements- Flexible Pavements and Rigid Pavements-Basics of Harbour, Tunnel, Airport and Railway Engineering.

Unit - III	Water Resources Engineering and Environmental Engineering

Water Resources Engineering and Environmental Engineering: Introduction-Sources of water- Quality of water- Specifications- Introduction to Hydrology-Rainwater Harvesting- Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs).

Introduction to Environmental Engineering- Waste Water Management- Importance of Reduce, Reuse, Recycle- Sustainability.

Learning Resources:

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-ll, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. G. S. Birdie, Water supply and sanitary Engineering", Dhanpat Rai & Sons Publishers.
4. Bansal R. K, "Strength of Materials", Laxmi Publications, 2010.
5. Highway Engineering, S.K.Khanna, C.E,G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
6. Indian Standard Drinking Water — Specification Is 10500-2012.

Web Resources:

PART – B: BASIC MECHANICAL ENGINEERING

Course Objectives:

The students after completing the course are expected to

- Get familiarized with the scope and of Mechanical Engineering in different sectors and industries.
- Explain different engineering materials and different manufacturing processes.
- Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

Course Outcomes: On completion of the course, the Student Should be able to

CO1: Understand the different manufacturing processes.

C02: Explain the basics of thermal engineering and its applications

C03: Describe the working of different mechanical power transmission systems and power plants

C04: Describe the basis of robotics and its applications

Unit - I	**Introduction to Mechanical Engineering and Engineering Materials**

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.

Unit - II	**Manufacturing Process and Thermal Engineering**

Manufacturing Process: Principle 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.

Unit - III	**Power Plants, Mechanical Power Transmission and Introduction to Robotics**

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.

(Note: The Subject covers only the basic principles of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the fundamentals of the subject**)**

Textbooks:

l. A Text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

2. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.
3. G. Shanmugam and M.S.PaIanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.
4. Basic Mechanical Engineering by Sadhu Singh, S Chand publications 2012

Reference Books:

1. Intemal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.
2. Appuu Kuttan KK, Robotics, 14K. International Publishing House Pvt. Ltd. Volume-I
3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
4. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

Web Resources:

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B.TECH.-CIVIL ENGINEERING

Course Code	ENGINEERING MECHANICS	L	T	P	C
23AME03		3	0	0	3
Semester	I B. Tech II Semester				

Course Objectives:

- To get familiarized with different types of force systems.
- To draw accurate free body diagrams representing forces and moments acting on a body to analyse the equilibrium of system of forces.
- To understand the basic principles of centre of gravity, centroid and moment of inertia and determine them for different simple and composite bodies.
- To apply the Work-Energy method to particle motion.
- To learn the kinematics and kinetics of translational and rotational motion of rigid bodies.

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

CO1: Understand the fundamental concepts in mechanics and determine the frictional forces for bodies in contact.
CO2: Analyse different force systems such as concurrent, coplanar and spatial systems and calculate their resultant forces and moments.
CO3: Locate the centroids, centre of gravity and moment of inertia of different geometrical shapes.
CO4: Apply the principles of work-energy and impulse-momentum to solve the problems of rectilinear and curvilinear motion of a particle.
CO5: Solve the problems involving the translational and rotational motion of rigid bodies.

Unit - I	Introduction to Engineering Mechanics, Friction

Introduction to Engineering Mechanics– Basic Concepts- Scope and Applications Systems of Forces: Coplanar Concurrent Forces– Components in Space–Moment of Force and its Application –Couples - Resultant of Force Systems.
Friction: Introduction- limiting friction and impending motion- Coulomb's laws of dry friction- coefficient of friction- Cone of Static friction.

Unit - II	Equilibrium of Systems of Forces, Equations of Equilibrium for Spatial System of forces

Equilibrium of Systems of Forces: Free Body Diagrams- Lami's Theorm- Equations of Equilibrium of Coplanar System- Graphical method for the equilibrium- Triangle law of forces- converse of the law of polygon of forces condition of equilibrium
Equations of Equilibrium for Spatial System of forces- Numerical examples on spatial system of forces using vector approach.

Unit - III	Centroid and Area Moments of Inertia

Centroid: Centroids of simple figures (from basic principles)–Centroids of Composite Figures-
Centre of Gravity: Centre of gravity of simple body (from basic principles)- Centre of gravity of composite bodies- Pappus theorems.
Area Moments of Inertia: Definition– Polar Moment of Inertia- Transfer Theorem- Moments of Inertia of Composite Figures- Products of Inertia- Transfer Formula for Product of Inertia
Mass Moment of Inertia: Moment of Inertia of Masses-Transfer Formula for Mass Moments of Inertia- Mass Moment of Inertia of composite bodies.

Unit - IV	Rectilinear and Curvilinear motion of a particle

Rectilinear and Curvilinear motion of a particle: Kinematics and Kinetics–D'Alembert's Principle - Work Energy method and applications to particle motion-Impulse Momentum method.

Unit - V	**Rigid body Motion**
Rigid body Motion: Kinematics and Kinetics of translation- Rotation about fixed axis and plane motion- Work Energy method and Impulse Momentum method. Principle of virtual work with simple examples- Analysis of plane trusses.	
Learning Resources:	
Textbooks: 1. Engineering Mechanics, S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., , McGraw Hill Education 2017. 5th Edition. 2. Engineering Mechanics, P.C.Dumir- S.Sengupta and Srinivas V veeravalli , University press. 2020. First Edition. 3. A Textbook of Engineering Mechanics, S.S Bhavikatti. New age international publications 2018. 4th Edition.	
Reference Books: 1. Engineering Mechanics, Statics and Dynamics, Rogers and M A. Nelson., McGraw Hill Education. 2017. First Edition. 2. Engineering Mechanics, Statics and Dynamics, I.H. Shames., PHI, 2002. 4th Edition. 3. Engineering Mechanics, Volume-I: Statics, Volume-II: Dynamics, J. L. Meriam and L.G. Kraige., John Wiley, 2008. 6th Edition. 4. Introduction to Statics and Dynamics, Basudev Battachatia, Oxford University Press, 2014. Second Edition 5. Engineering Mechanics: Statics and Dynamics, Hibbeler R.C., Pearson Education, Inc., New Delhi, 2022, 14th Edition.	

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Course Code	COMMUNICATIVE ENGLISH LAB (Common to all Branches Of Engineering)	L	T	P	C
23AHS01P		0	0	2	1
Semester	I B. Tech I Sem (EEE, CSE & FT) & I B. Tech II Sem (CE, ME & ECE)				

Course Objectives:

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

Course Outcomes (CO): Student will be able to

CO1: Understand the different aspects of the English language proficiency with emphasis **o**n LSRW skills.
CO2: Apply communication skills through various language learning activities.
CO3: Analyse 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 resume and prepare themselves to face interviews in future.

List of Topics:

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

Suggested Software:

- Walden Infotech
- Young India Films
- K-Van Solutions

References 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

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B. TECH. CIVIL ENGINEERING

Course Code	**ENGINEERING CHEMISTRY LAB**	**L**	**T**	**P**	**C**
23ABS04P		**0**	**0**	**2**	**1**
Semester	**I B. Tech II Semester Civil and Mechanical**				

Course Objectives:

- To verify the fundamental concepts with experiments.

Course Outcomes (CO): Student will be able to

CO1: Determine the cell constant and conductance of solutions.
CO2: Prepare advanced polymer materials.
CO3: Determine the physical properties like surface tension, adsorption and viscosity.
CO4: Estimate the Iron and Calcium in cement.
CO5: Calculate the hardness of water.

List of Experiments

1. Determination of Hardness of a groundwater sample.
2. Estimation of Dissolved Oxygen by Winkler's method.
3. Determination of Strength of an acid in Pb-Acid battery.
4. Preparation of a Polymer (Bakelite)
5. Determination of percentage of Iron in Cement sample by colorimetry.
6. Estimation of Calcium in Portland cement.
7. Preparation of nanomaterials by Precipitation method.
8. Adsorption of acetic acid by charcoal.
9. Determination of percentage Moisture content in a coal sample
10. Determination of Viscosity lubricating oil by Redwood Viscometer 1.
11. Determination of Viscosity of lubricating oil by Redwood Viscometer 2.
12. Determination of Calorific value of gases by Junker's gas Calorimeter.

Learning Resources:

Reference Books:

"Vogel's Quantitative Chemical Analysis 6th Edition" Pearson publications by J. Mendham, R.C. Denney, J.D. Barnes and B. Sivasankar

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B.TECH.- CIVIL ENGINEERING

Course Code	ENGINEERING WORKSHOP (Common to All Branches)	L	T	P	C
23AME02		0	0	3	1.5
Semester	I B. Tech II Semester				

Course Objectives:

- To familiarize students with wood working, sheet metal operations, fitting and electrical house wiring skills

CO1: Identify workshop tools and their operational capabilities.
C02: Practice on Manufacturing of Components using Workshop Trades Including Fitting, carpentry, foundry and Welding.
C03: Apply fitting Operations in Various applications.
C04: Apply basic Electrical Engineering Knowledge for House Wiring Practice.

Course Outcomes (CO): Student will be able to

List of Experiments:

1. **Demonstration:** Safety Practices and precautions Observed in workshop
2. **Wood Working:** Familiarity with different types of woods and tools used in wood working and make 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 fitting and 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.

Learning Resources:

Textbooks:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edna 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.
4. Balasubramanyam, N., Prof. Prasanthi, G., A Text Manual of Engineering workshop Technology Anchor Academic Publishing, Hamburg, 2016.

Web Resources:

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B.TECH.- CIVIL ENGINEERING

Course Code	ENGINEERING MECHANICS & BUILDING PRACTICES LAB (Civil Branch)	L	T	P	C
23ACME02		0	0	3	1.5
Semester	I B. Tech II Semester (CIVIL)				

Course Objectives: The students completing the course are expected to

- Verify the Law of Parallelogram of Forces and Lami's theorem.
- Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.
- Understand the layout of a building, concepts of Non-Destructive Testing and different Alternative Materials.

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

CO1: Evaluate the coefficient of friction between two different surfaces and between the inclined plane and the roller.
CO2: Verify Law of Parallelogram of forces and Law of Moment using force polygon and bell crank lever.
CO3: Locate the Centre of gravity different configurations
CO4: Understand the Quality Testing and Assessment Procedures and principles of Non-Destructive Testing.
CO5: Exposure to safety practices in the construction industry.

List of Experiments:

Note: Students have to perform any **10** of the following Experiments:

1. To study various types of tools used in construction.
2. Calculate the Forces in Pin Jointed Trusses
3. Experimental Proof of Lami's Theorem
4. Verification of Law of Parallelogram of Forces.
5. Location of Centre of Gravity of different shaped Plane Lamina.
6. Determination of coefficient of Static and Rolling Friction.
7. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever
8. Study the Material Properties of Alternative Materials like M-sand, Fly ash, Sea Sand etc.
9. Demonstration of Non-Destructive Testing - using Rebound Hammer & UPV
10. Field-Visit to understand the Quality Testing - report.
11. Safety Practices in Construction industry
12. Identification of Plumbing in buildings.

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Course Code		**L**	**T**	**P**	**C**
23AHSS1	**Health and Wellness/ Yoga and Sports/Taekwondo** (Common to all Branches)	**0**	**0**	**1**	**0.5**
Semester	**I B. Tech I Sem (EEE, CSE & FT) I B. Tech II Sem (CE, ME & ECE)**				

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 development of the personality.

Course Outcomes (CO): 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 I

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 balanced diet for all age groups

UNIT II

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 III

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. Wiseman, John Lofty, *SAS Survival Handbook*: *The Ultimate Guide to Surviving Anywhere* Third Edition, William Morrow Paperbacks, 2014
4. *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 manyas Games/Sports.
3. Institutes are required to provide sports instructor / yoga teacher 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, totaling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.