B.Tech (Regular-Full time)

(Effective for the students admitted into I year from the Academic Year 2025-26 onwards)

ELECTRONICS AND COMMUNICATION ENGINEERING

I-YEAR COURSE STRUCTURE AND SYLLABUS

INSTITUTE VISION

To prepare professionally superior and ethically strong global women power in technology and management to serve the nation and the world.

INSTITUTE MISSION

M1: To Provide students with advanced training in up-to-date technologies, this equips them with relevant skills for the modern professional world.

M2: To Empower students to research and innovate, addressing challenges professionally and personally.

M3: To Motivate students to operate with utmost efficiency to succeed in a competitive global environment.

DEPARTMENT VISION

CSE department envisions becoming a centre of excellence in engineering by imparting high-quality education through teaching, training, and research.

DEPARTMENT MISSION

M1: Facilitate learning in advanced technologies with the use of innovative methods and to be adaptable to shifting socio-economic and environmental conditions with a well-equipped infrastructure.

M2: Provide strong theoretical and practical background across the computer science discipline with an emphasis on software development.

M3: Impart moral, ethical values and interpersonal skills to the students.

M4: Pursue the acquisition of knowledge, develop technologies, transform education, engage with academic and research institutions, and cultivate ties with alumni and Industry.

PROGRAM OUTCOMES (PO's)

Engineering Graduates will be able to:

1. Engineering knowledge: Apply The knowledge of mathematics, science, engineering Fundamentals, and an engineering specialization to the solution of complex engineering Problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze Complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEO's)

PEO1: Graduates of the program will have strong fundamental knowledge in Computer Science and Engineering, technical proficiency, and problem-solving skills to develop pioneering solutions.

PEO2: Graduates of the program will have the necessary domain knowledge and a successful professional career in IT and associated fields of Computer Science and Engineering.

PEO3: Graduates of the Computer Science and Engineering program will exhibit teamwork, good communication skills and high patterns of discipline in their profession.

PROGRAM SPECIFIC OUTCOMES (PSO's)

PSO1: Accomplish the ability to design, develop and implement computer programs and use knowledge in various domains.

PSO2: Ability to get employment in different environments related to the software industry.

B.TECH. I YEAR ECE - COURSE STRUCTURE & SYLLABUS – GITAMW-R25
(Applicable from the academic year 2025-26 onwards)

INDUCTION PROGRAMME

S. No.	Course Name	Category	L-T-P-C
1	Physical Activities-- Sports, Yoga and Meditation, Plantation	MC	0-0-6-0
2	Career Counseling	MC	2-0-2-0
3	Orientation to all branches—career options, tools, etc.	MC	3-0-0-0
4	Orientation to all branches -- career options, tools, etc.	EC	2-0-3-0
5	Proficiency Modules & Productivity Tools	ES	2-1-2-0
6	Assessment on basic aptitude and mathematical skills	MC	2-0-3-0
7	Remedial Training in Foundation Courses	MC	2-1-2-0
8	Human Values & Professional Ethics	MC	3-0-0-0
9	Communication Skills -- focus on Listening, Speaking, Reading, Writing skills	BS	2-1-2-0
10	Concepts of Programming	ES	2-0-2-0

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

B.Tech I Year I Semester

S. No.	Category	Subject Code	Title	L	T	P	Credits
1	BS&H	25G56101T	Engineering Physics	3	0	0	3
2	BS&H	25G54101	Linear Algebra & Calculus	3	0	0	3
3	Engineering Science	25G02101T	Basic Electrical &Electronics Engineering	3	0	0	3
4	Engineering Science	25G03101T	Engineering Graphics	1	0	4	3
5	Engineering Science	25G05101T	Introduction to Programming	3	0	0	3
6	Engineering Science	25G05102	IT Workshop	0	0	2	1
7	BS&H	25G56101P	Engineering Physics Lab	0	0	2	1
8	Engineering Science	25G02101P	Electrical &Electronics Engineering Workshop	0	0	3	1.5
9	Engineering Science	25G05101P	Computer Programming Lab	0	0	3	1.5
10	BS&H	25G99101	NSS/NCC/Scouts& Guides/Community Service	-	-	1	0.5
			Total	**13**	**00**	**15**	**20.5**

B.Tech I Year II Semester

S. No.	Category	Subject Code	Title	L/D	T	P	Credits
1	BS&H	25G52201T	Communicative English	2	0	0	2
2	BS&H	25G51202T	Chemistry	3	0	0	3
3	Engineering Science	25G54201	Differential Equations & Vector Calculus	3	0	0	3
4	Engineering Science	25G01201T	Basic Civil & Mechanical Engineering	3	0	0	3
	Professional core	25G04201T	Network Analysis	3	0	0	3
5	BS&H	25G52201P	Communicative English Lab	0	0	2	1
7	BS&H	25G51202P	Chemistry Lab	0	0	2	1
8	Engineering Science	25G03201	Engineering Workshop	0	0	3	1.5
9	Professional core	25G04201P	Network Analysis And Simulation Laboratory	0	0	3	1.5
10	BS&H	25G99201	Health and Wellness, Yoga and Sports	-	-	1	0.5
			Total	**14**	**00**	**11**	**19.5**

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
3	0	0	3

ENGINEERING PHYSICS (25G56101T)
(Common for 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: Analyse the intensity variation of light due to polarization, interference and diffraction.
CO2: Familiarize with the basics of crystals and their structures.
CO3: Classify various types of polarization of dielectrics and magnetic materials.
CO4: Understand fundamentals of quantum mechanics and apply to the motion of particles in energy bands of solids.
CO5: Identify the type of semiconductor using Hall effect.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	2	1	1	-	-	-	-	-	-	1
CO2	3	2	1	2	2	-	-	-	-	-	-	-
CO3	2	3	1	2	2	-	-	-	-	-	-	1
CO4	2	3	2	1	2	-	1	-	-	-	-	-
CO5	2	2	3	2	1	-	-	-	-	-	-	1

UNIT-I   Wave Optics

Interference: Introduction - Principle of superposition –Interference of light - Interference in thin films (Reflection Geometry) & applications - Colors 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.

Fiber Optics: Introduction, Significance of Optical Fiber in Science and Technology

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. Calculation of atomic packing Factor for NACL crystal.

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

UNIT-III Dielectric and Magnetic Materials

Dielectric Materials: Introduction - Applications, 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 -Applications, Magnetic dipole moment - Magnetization- Magnetic susceptibility and permeability – Atomic origin of magnetism,Langevin theory 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

UNIT-IV Quantum Mechanics and Freel electron theory

Quantum Mechanics: Introduction to black body radiation, 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. **Significance of quantum mechanics and technology**

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.

superconductors: **Introduction, classification, Kroniger penny model, Concept of Effective Mass, Applications**

TEXTBOOKS:

1. A Textbook 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

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
3	0	0	3

LINEAR ALGEBRA & CALCULUS (25G54101)
(Common to All Branches of Engineering)

COURSE OBJECTIVES:

The main objective is to equip students with standard concepts and tools in mathematics at an intermediate to advanced level, fostering confidence and ability to handle real-world problems and their applications.

COURSE OUTCOMES (COS):

Upon completion of the course, students will be able to:

CO1: Develop and apply matrix algebra techniques, with emphasis on complex matrices and their properties, to address practical engineering applications.

CO2: Apply mean value theorems to solve real-life problems

CO3: Become familiar with functions of several variables, useful in optimization.

CO4: Learn important calculus tools in higher dimensions.

CO5: Become familiar 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.

MAPPING OF CO'S & PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	2	-	-	-	-	-	-	-
CO2	3	1	2	2	1	-	-	-	-	-	-	-
CO3	2	2	2	2	1	-	-	-	-	-	-	-
CO4	3	2	1	3	2	-	-	-	-	-	-	-
CO5	2	3	2	1	2	-	-	-	-	-	-	-

UNIT- I MATRICES

Rank of a matrix by echelon form and normal form, CauchyBinet formulae (without proof). Inverse of Non singular matrices by GaussJordan method. Solving systems of homogeneous and non homogeneous linear equations using Gauss Elimination method. Iterative methods:Jacobi and Gauss Seidel Iteration Methods. **Complex matrices and its properties.**

UNIT-II EIGENVALUES, EIGENVECTORS AND ORTHOGONAL TRANSFORMATION

Eigen values, Eigenvectors, and their properties. Diagonalization of a matrix. Cayley-Hamilton Theorem (without proof), including finding the inverse and power of a matrix using this theorem. Quadratic forms, nature of quadratic forms, and reduction to canonical forms by Orthogonal Transformation. **Engineering applications of linear algebra.**

UNIT- III CALCULUS

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

UNIT - IV PARTIAL DIFFERENTIATION AND APPLICATIONS (MULTI VARIABLE CALCULUS)

Functions of several variables, continuity, and differentiability. Partial derivatives, total Derivatives, chain rule, and directional derivative. Taylor's and Maclaurin's series expansion of functions of two variables. Jacobians, functional dependence, maxima and minima of functions of two variables and three variables, the method of Lagrange multipliers.

UNIT -V MULTIPLE INTEGRALS (MULTI VARIABLE CALCULUS)

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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

I Year B.Tech. ECE – I Semester

L	T	P	C
3	0	0	3

BASIC ELECTRICAL & ELECTRONICS ENGINEERING (25G02101T)
(Common to All branches of Engineering)

COURSE OBJECTIVES:

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

COURSE OUTCOMES:

After the completion of the course students will be able to
CO1: Remember the fundamental laws, operating principles of motors, generators, MC and MI instruments.
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.
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.
CO4: Analyze different electrical circuits, performance of machines and measuring instruments.
CO5: Evaluate different circuit configurations, Machine performance and Power systems operation.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	3	-	-	-	-	-	2	-	-	1
CO2	3	2	1	-	-	1	1	-	-	-	-	1
CO3	3	2	2	-	1	-	-	-	-	-	-	1
CO4	3	3	2	-	1	-	-	-	-	-	-	1
CO5	3	3	2	1	1	2	1	-	-	-	-	1

PART A: BASIC ELECTRICAL ENGINEERING

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, 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.

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, Dhanpati 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

PART B: BASIC ELECTRONICS ENGINEERING

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:
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.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	-	2	-	-	-	2	-	-	2
CO2	3	2	3	-	-	2	-	-	-	-	2	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	2	-	1	1	-	1

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. 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)

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. Santi ram 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.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
1	0	4	3

ENGINEERING GRAPHICS (25G03101T)
(Common to All branches of Engineering)

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 skills for better understanding of projection of solids
- To develop the imaginative skills of the students 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:

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 draw projection of solids in various positions in first quadrant.

CO4: Able to draw the development of surfaces of simple objects.

CO5: Prepare isometric and perspective sections of simple solids.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	1	-	-	-	-	1	2	1
CO2	3	3	2	-	1	-	-	-	-	1	-	1
CO3	3	2	2	-	1	-	-	-	-	1	-	1
CO4	3	2	2	-	1	-	-	-	-	1	1	1
CO5	3	2	2	-	1	-	-	-	-	1	2	1

UNIT-I

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

Curves: construction of ellipse, parabola and hyperbola by general, 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, 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.

UNIT-III

Projections of Solids: Types of solids :Polyhedral 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.

UNITI-IV

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.

UNIT-V

Conversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.
Computer graphics:
Creating 2D&3D drawings of objects including PCB and Transformations using Auto CAD (Not for end examination).

TEXTBOOK:
 1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

REFERENCE BOOKS:
1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc,2009.
3. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill, 2017.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
3	0	0	3

INTRODUCTION TO PROGRAMMING (25G05101T)
(Common to All branches of Engineering)

COURSE OBJECTIVES:

- 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:

A student after completion of the course will be able to
CO1: Apply algorithms, flowcharts, and basic programming concepts for problem solving.
CO2: Develop programs using conditional and looping constructs.
CO3: Implement data handling using arrays and string operations.
CO4: Use pointers, structures, and dynamic memory for efficient programming.
CO5: Apply functions, recursion, and file handling for modular and persistent programs.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2	–	–	–	–	–	–	3
CO2	3	3	2	2	2	–	–	–	–	–	–	3
CO3	3	3	2	2	2	–	–	–	–	–	–	3
CO4	3	3	2	2	3	–	–	–	–	–	–	3
CO5	3	3	3	2	3	–	–	–	–	2	2	3

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

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, **Predefined processors**, Primitive Data Types, Variables, and Constants, Basic Input and Output, Operations, Type Conversion, and Casting, **Command Line Argument**

Problem solving techniques: Algorithmic approach, characteristics of algorithm, Problem solving strategies: Top-down approach, Bottom-up approach, Time and space complexities of algorithms. **Storage classes (auto, static, extern, register)**

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, **String handling predefined functions**

UNIT- IV   Pointers & User Defined Data types

Pointers, dereferencing and address operators, pointer and address arithmetic, **Argument passing using pointers**, array manipulation using pointers, User-defined data types-Structures and Unions, **Introduction to Dynamic Memory Allocation, Predefined Processors**, **Macros**

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, **Recursion**. Scope and Lifetime of Variables, Basics of File Handling, **File handling functions**

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

TEXTBOOKS:

1. "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice-Hall, 1988
2. Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

1. Computing fundamentals and C Programming, Bala gurusamy, E., McGraw-Hill Education, 2008.
2. Programming in C, Rema Theraja, Oxford, 2016, 2nd edition
3. C Programming, A Problem-solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rdedition

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
0	0	2	1

IT WORKSHOP (25G05102)
(Common to all branches of Engineering)

COURSE OBJECTIVES:

- 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:

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 spreadsheet

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

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
0	0	2	1

ENGINEERING PHYSICS LAB (25G56101P)
(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 and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

COURSE OUTCOMES:

The students will be able to
CO1: Operate optical instruments like travelling microscope and spectrometer.
CO2: Estimate the wavelengths of different colours using diffraction grating.
CO3: Plot the intensity of the magnetic field of circular coil carrying current with distance.
CO4: Evaluate dielectric constant and magnetic susceptibility for dielectric and magnetic materials respectively.
CO5: Calculate the band gap of a given semiconductor.
CO6: Identify 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. 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.

References:

- 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

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

L	T	P	C
0	0	3	1.5

ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP (25G02101P)
(Common to All branches of Engineering)

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

COURSE OUTCOMES:
CO1: Understand the Electrical circuit design concept; measurement of resistance, power, power factor; concept of wiring and operation of Electrical Machines and Transformer.
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.
CO3: Apply the theoretical concepts to obtain calculations for the measurement of resistance, power and power factor.
CO4: Analyse various characteristics of electrical circuits, electrical machines and measuring instruments.
CO5: Design suitable circuits and methodologies for the measurement of various electrical parameters; Household and commercial wiring.

PART A: ELECTRICAL ENGINEERING LAB

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, Dhanpati 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 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:

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
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. 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.

Activities: 1. Familiarization of commonly used Electrical & Electronic Workshop Tools: Bread board, Solder, cables, relays, switches, connectors, fuses, Cutter, plier, screwdriver set, wire stripper, flux, knife/blade, soldering iron, de-soldering pump etc. Provide some exercises so that hardware tools and instruments are learned to be used by the students.

2. Familiarization of Measuring Instruments like Voltmeters, Ammeters, multimeter, LCR-Q meter, Power Supplies, CRO, DSO, Function Generator, Frequency counter. Provide some exercises so that measuring instruments are learned to be used by the students.

3. Components: Familiarization/Identification of components (Resistors, Capacitors, Inductors, Diodes, transistors, IC's etc.) – Functionality, type, size, colour coding package, symbol, cost etc. Testing of components like Resistor, Capacitor, Diode, Transistor, ICs etc. - Compare values of components like resistors, inductors, capacitors etc with the measured values by using instruments

I Year B.Tech. ECE – I Semester

L	T	P	C
0	0	3	1.5

COMPUTER PROGRAMMING LAB (25G05101P)
(Common to All branches of Engineering)

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

COURSE OUTCOMES:
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, 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.
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 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 bit fields.
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.
iv) 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.

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

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – I Semester

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NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE (25G99101)
(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 analysing 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 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 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:

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.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – II Semester

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2	0	0	2

COMMUNICATIVE ENGLISH (25G52201T)

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: Applygrammaticalstructurestoformulatesentencesandcorrectwordforms.
CO3: Analysediscoursemarkerstospeakclearlyonaspecifictopicininformaldiscussions.
CO4: Evaluate reading / listening text sand to write summaries based on global – Comprehension of these texts.
CO5: Create a coherent paragraph, essay, and resume.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	1	-	-	-	2	-	3	2	3	-	2
CO2	-	1	-	-	-	-	-	-	2	3	-	2
CO3	-	2	-	-	-	2	-	-	2	3	-	2
CO4	-	2	-	-	-	2	-	-	2	2	-	2
CO5	-	2	1	-	-	-	-	1	1	3	1	2

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. **One-word substitutes.**

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

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 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. **Idioms and phrases.**

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 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, 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: Letter Writing: Official Letters, Resumes, **Report writing.**
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, **Role play**
Reading: Reading comprehension. Writing: Writing structured essays on specific topics. Grammar: Editing short texts –identifying and correcting common errors in grammar and usage (articles, prepositions, tenses, subject verb agreement), **Information Transfer.**
Vocabulary: Technical Jargons.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

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.
B.Tech. – Computer Science & Engineering JNTUA R23 Regulations.
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_NJZE8qK8sfp

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – II Semester

L	T	P	C
3	0	0	3

CHEMISTRY (25G51202T)
(Common to EEE, ECE, CSE, IT & allied branches)

COURSE OBJECTIVES:

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

COURSE OUTCOMES (COS):

CO1: Analyse microscopic chemistry in terms of atomic and molecular orbital's

CO2: Know the origin of different types of engineering materials used in modern technology Apply the principles of band diagrams in the application of conductors and semiconductors.

CO3: Compare the materials of construction for battery and electrochemical sensors. Recognize various problems related to electrochemistry.

CO4: Explain the preparation, properties, and applications of thermoplastic and thermosetting, Elastomers, conducting polymers, and liquid crystal polymers

CO5: Understand the principles of spectrometry, solid-liquid chromatography of solid and liquid mixtures. Relate electromagnetic spectra used for exciting different molecular energy levels in various spectroscopic techniques and their application

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	3	1	-	-	-	-	-	2	-	-	2
CO3	3	3	2	-	-	2	2	2	-	-	-	1
CO4	3	3	2	-	-	2	2	-	-	-	2	2
CO5	3	2	1	3	2	-	-	2	2	-	2	1

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

UNIT-I

Structure and Bonding Models: Fundamentals of Quantum mechanics, Schrodinger Wave equation, significance of Ψ and $\Psi2$, particle in one-dimensional box, molecular orbital theory – bonding in homo- and hetero nuclear diatomic molecules – energy level diagrams of O2, and CO, etc. π-molecular orbitals of butadiene and benzene, calculation of bond order.

UNIT- II

Electro chemistry and Applications:

Electrochemical cells, Nernst equation, cell potential calculations and numerical problems, potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conduct metric 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, **lead acid battery**; Fuel cells, hydrogen-oxygen fuel cell– working of the cells. Polymer Electrolyte Membrane Fuel Cells (PEMFC).

UNIT-III

Modern engineering materials:

Semiconductors – Introduction, basic 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 Graphene nanoparticles**.**

UNITI-IV

Polymer Chemistry:

Introduction to polymers, functionality of monomers, chain growth and step growth Polymerization, coordination 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, carbon fibres. Elastomers– **Compounding and processing of natural rubber**. Buna-S, Buna-N– preparation, properties and applications. Conducting polymers – polyacetylene, polyaniline, –mechanism of conduction and Applications **in mobile / TV screens**. Bio-Degradable polymers -Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA). **Biopolymers and its functions. Liquid crystal**
Polymers.

UNIT-V

Instrumental Methods and Applications:

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. UV-Visible Spectroscopy, electronic transition, Instrumentation, IR spectro scopies, fundamental modes and selection rules, Instrumentation. Chromatography Basic Principle, Classification, HPLC: Principle, Instrumentation and Applications**.**

TEXTBOOKS:

1. JainandJain,EngineeringChemistry,16/e,DhanpatRai,2013.
2. PeterAtkins,JuliodePaulaandJamesKeeler,Atkins'PhysicalChemistry,10/e, Oxford University Press, 2010.

REFERENCE BOOKS:

1. Skoog and West, Principles ofInstrumentalAnalysis,6/e,Thomson,2007.
2. J.D.Lee,ConciseInorganicChemistry,5thEdition,WileyPublications,Feb.2008 Textbook of Polymer Science, FredW. Bill mayer Jr,3rdEdition

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – II Semester

L	T	P	C
3	0	0	3

DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS (25G54201)
(Common to All Branches of Engineering)

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: Solve the differential equations related to various engineering fields.
CO2: Identify solution methods for partial differential equations that model physical processes.
CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence.
CO4: Estimate the work done against a field, circulation and flux using vector calculus.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	1	2	-	-	-	-	-	-	1
CO2	3	2	2	2	1	-	-	-	-	-	-	1
CO3	2	2	1	2	1	-	-	-	-	-	-	1
CO4	3	2	2	1	2	-	-	-	-	-	-	1

UNIT –I
Differential equations of first order and first degree
Exact equations and equations reducible to exact form, **linear** differential equations, Bernoulli's equations, Applications: Newton's Law of cooling, Law of natural growth and Decay, **Orthogonal trajectories**.

UNIT -II
Linear differential equations of higher order with Constant Coefficients
Definitions: Complimentary function, particular integral, general solution, homogeneous and Non-homogeneous equations,. Wronskian, Method of variation of parameters, Simultaneous Linear equations, Applications to L-C-R Circuit problems and Simple Harmonic motion.

UNIT- III
Partial Differential Equations
Introduction and formation of Partial Differential Equations by elimination of arbitrary Constants and arbitrary functions Solutions of first-order linear equations using Lagrange's Method, Homogeneous Linear Partial differential equations with constant coefficients. Non Homogeneous partial differential equation for standard form.

UNIT- IV
Vector differentiation
Introduction of Vector differentiation - Scalar and vector point functions-vector operator del,-Del applied to scalar point functions, -Gradient - Directional derivatives Delapplied to vector point functions-Divergence and Curl- vector identities– Delapplied twice to point functions.

UNIT- V
Vector integration
 Line integral-circulation, work done-surface integral, flux-volumeintegral.Green's theorem in the plane (without proof)- Stoke's theorem (without proof)- Divergence theorem (without proof) - Verification of Green's, Stoke's and Gauss Theorems.

TEXTBOOKS:
1. ErwinKreyszig, Advanced Engineering Mathematics,10/e, John Wiley &Sons, 2018.
2. B.S.Grewal,HigherEngineeringMathematics,44/e, Khanna publishers, 2017.
3. T.K.V.Iyengar, B.Krishna Gandhi, AText Book of Engineering Mathematics, Vol – I, S. Chand & Company.

REFERENCE BOOKS:
1. Dennis G.Zill and Warren S.Wright, Advanced Engineering Mathematics, Jones and Bartlett, 2018.
2. Micheael Greenberg, Advanced Engineering Mathematics, 9th edition, Pearsonedn
3. GeorgeB.Thomas,MauriceD.WeirandJoelHass,ThomasCalculus,14/e,Pearson Publishers, 2018.
4. R.K.JainandS.R.K.Iyengar,AdvancedEngineeringMathematics,5/e,Alpha   Science International Ltd., 2021 (9th reprint).
5. B.V.Ramana, Higher Engineering Mathematics, Mc GrawHill Education, 2017.
6. N.P.Bali and Manish Goyal, A textbook of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

E-RESOURCES AND DIGITAL MATERIAL:
1. https://onlinecourses.nptel.ac.in/noc23_ma86/preview
2. https://onlinecourses.nptel.ac.in/noc23_ma90/preview

I Year B.Tech. ECE – II Semester

L	T	P	C
3	0	0	3

BASIC CIVIL AND MECHANICAL ENGINEERING (25G01201T)
(Common to All branches of Engineering)

BASIC CIVIL ENGINEERING

COURSE OBJECTIVES:
- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

COURSE OUTCOMES:
 On completion of the course, the student should be able to:
CO1: Understand various sub-divisions& applications of Civil Engineering and to appreciate their role in ensuring a better society.
CO2: Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying.
CO3: Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation.
CO4: Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	2	2	1	-	1	-	1
CO2	3	2	1	-	-	2	1	-	-	1	-	1
CO3	3	2	1	-	2	2	3	-	-	1	-	1
CO4	3	2	1	-	-	2	2	1	-	1	-	1
CO5	3	2	1	-	-	2	-	-	-	1	-	1

PART A: BASIC CIVIL ENGINEERING

UNIT-I
Basics of Civil Engineering: Role of Civil Engineers in Society -**Applications of Civil Engineering**-Various Disciplines of Civil Engineering- Structural Engineering- Geo-technical Engineering-Transportation Engineering-Hydraulics and Water Resources Engineering - Environmental Engineering- Scope of each discipline-Building Construction and Planning-Construction Materials-Cement-Aggregate- Bricks- Cement concrete- Steel. Introduction to Prefabricated construction Techniques.

UNIT-II
Surveying: Objectives of Surveying-**Applications**-Horizontal Measurements-Angular Measurements-Introduction to Bearings Levelling instruments used for levelling-Simple problems on levelling and bearings-Contour mapping.

UNIT-III
Transportation Engineering: Importance of Transportation in Nation's economic development-Types of Highway Pavements- Flexible Pavements and Rigid Pavements - Simple Differences. Basics of Harbour, Tunnel, Airport, and Railway Engineering.

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

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 Publishers 2019. 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. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nem Chand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 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 indifferent 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 and applications.

CO2: Explain the basics of thermal engineering and its applications.
CO3: Describe the working of different mechanical power transmission systems and power plants.
CO4: Describe the basics of robotics and its applications.

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	2	-	-	-	1	-	1
CO2	3	2	1	-	-	2	-	-	-	1	-	1
CO3	3	2	1	-	2	2	-	-	-	1	-	1
CO4	3	2	1	-	-	2	2	-	-	1	-	1

UNIT-I

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 and **applications of engineering materials.**

UNIT-II

Manufacturing Processes: Principles of Casting**,** Forming, joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing.

Thermal Engineering – working principle of Boilers, **applications 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 – working principle of Steam, Diesel, Hydro, Nuclear power plants and **Applications 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:

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 Hill publications (India) Pvt. Ltd.
4. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – II Semester

L	T	P	C
3	0	0	3

NETWORK ANALYSIS (25G04201T)
(ECE & Allied Branches)

COURSE OBJECTIVES:
- To introduce basic electrical circuits with nodal and mesh analysis and network theorems.
- To introduce Transient response for DC and AC excitation by applying Laplace Transforms.
- To explain Steady State Analysis of AC Circuits.
- To explain Steady State Analyse is of AC Circuits.
- To explain Steady State Analysis of AC Circuits.

COURSE OUTCOMES:
At the end of this course students will demonstrate the ability to
CO1: Understand basic electrical circuits with nodal and mesh analysis and network theorems
CO2: Analyze Transient response for DC and AC excitation by applying Laplace Transforms.
CO3: Analyse Steady state response of AC circuits
CO4: Understand the concept of resonance and Coupled Circuits
CO5: Compute the parameters of two-port networks

MAPPING OF CO'S& PO'S:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	-	-	-	-	-	-	-	-	1
CO2	3	3	2	1	-	-	-	-	-	-	-	1
CO3	3	2	1	-	-	-	-	-	-	-	-	1
CO4	3	2	2	-	-	-	-	-	-	-	-	1
CO5	3	3	2	1	-	-	-	-	-	-	-	1

UNIT -I

Types of circuit components, Types of Sources, Network reduction techniques- series, parallel circuits, Star-Delta conversion and Source Transformations, Mesh analysis and Nodal analysis, problem solving with resistances only including dependent sources also. Principal of Duality with examples. Network Theorems: Thevenin's, Norton's, Milliman's, Reciprocity, Compensation, Substitution, Superposition, Max Power Transfer, Tellegens - problem solving using dependent sources also.

UNIT- II

Transients: First order differential equations, Definition of time constants, R-L circuit, R-C circuit with DC excitation, evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogenous, problem-solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots.

Laplace transform: introduction, Laplace transformation, basic theorems, problem solving using Laplace transform, partial fraction expansion, Heaviside's expansions, problem solving using Laplace transform, Problems in S-domain.

UNIT- III

Steady State Analysis of A.C Circuits: Impedance concept, phase angle, series R-L, R-C, R-LC circuits problem solving. Complex impedance and phasor notation for R-L, R-C, R-L-C problem solving using mesh and nodal analysis, Star-Delta conversion, problem solving using Laplace transforms also, Applications of AC Circuits: phase shifters.

UNIT- IV

Resonance: Introduction, Definition of Q, Series resonance, Bandwidth of series resonance, Parallel resonance, general case-resistance present in both branches, anti-resonance at all frequencies, Effect of frequency on R, XL, XC, ZT in series resonant circuit.

Coupled Circuits: Self-inductance, Mutual inductance, Coefficient of coupling, analysis of coupled circuits, Natural current, Dot rule of coupled circuits, conductively coupled equivalent circuits-problem solving.

UNIT- V

Two-port Networks: Relationship of two port networks, Z-parameters, Y-parameters, Transmission line parameters, h- parameters, Relationships Between parameter Sets, Parallel & series connection of two port networks, cascading of two port networks, problem solving using dependent sources also, Conditions for reciprocity and symmetry in two-port networks. Image and iterative impedances. Image and iterative transfer constants. Insertion loss. Attenuators and pads. Lattice network and its parameters. Impedance matching networks.

TEXTBOOKS:

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
2. Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.
3. Network lines and Fields by John. D. Ryder 2nd Edition, PHI

REFERENCE BOOKS:

1. D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
2. Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
3.Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE– II Semester

L	T	P	C
0	0	2	1

COMMUNICATIVE ENGLISH LAB (25G52201P)
(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 emphasis on 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 Course Objectives:

LIST OF TOPICS:

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

Suggested Software:

• Walden Infotech
• Young India Films

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

REFERENCE BOOKS:

1. Raman Meenakshi, Sangeeta- Sharma. Technical Communication. Oxford Press.2018.
2. Taylor Grant: English Conversation Practice, TataMcGraw-HillEducationIndia,2016
3. Hewing's, Martin. Cambridge Academic English(B2). CUP,2012.
4. J. Sethi & P.V. Dhamija. A Course in Phonetics and Spoken English, (2ndEd), Kindle, 2013 B.Tech.
   – Computer Science & Engineering JNTUA R23 Regulations

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

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN
(AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – II Semester

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CHEMISTRY LAB (25G51202P)
(Common to EEE, ECE, CSE, IT & allied branches)

COURSE OBJECTIVES:

- To verify the fundamental concepts with experiments

COURSE OUTCOMES:

At the end of the course, the students will be able to
CO1: Determine the cell constant and conductance of solutions.
CO2: Prepare advanced polymer Bakelite materials.
CO3: Measure the strength of an acid present in secondary batteries.
CO4: Analyse the IR spectra of some organic compounds.
CO5: Calculate strength of acid in Pb-Acid battery.

LIST OF EXPERIMENTS:

1. Measurement of 10Dq by spectro photometric 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 a 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 Nano materials by precipitation method
12. Estimation of Ferrous Iron by Dichrometry

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

I Year B.Tech. ECE – II Semester

L	T	P	C
0	0	3	1.5

ENGINEERING WORKSHOP (25G03201)
(Common to All branches of Engineering)

COURSE OBJECTIVES:

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

COURSE OUTCOMES:

CO1: Identify workshop tools and their operational capabilities.

CO2: Practice on manufacturing of components using workshop trades including fitting, carpentry, and foundry and welding.

CO3: Apply fitting operations in various applications.

CO4: Apply basic electrical engineering knowledge for House Wiring Practice

SYLLABUS

1. **Demonstration**: Safety practices and precautions to be 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.

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.

GOUTHAMI INSTITUTE OF TECHNOLOGY & MANAGEMENT FOR WOMEN (AUTONOMOUS)

I B.TECH. ECE SYLLABUS

I Year B.Tech. ECE – II Semester

L	T	P	C
0	0	3	1.5

NETWORK ANALYSIS AND SIMULATION LABORATORY (25G04201P)
(ECE & allied branches)

COURSE OBJECTIVES:

- To gain hands on experience in verifying Kirchhoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

COURSE OUTCOMES:

CO1: Verify Kirchhoff's laws and network theorems.
CO2: Measure time constants of RL & RC circuits.
CO3: Analyze behavior of RLC circuit for different cases.
CO4: Design resonant circuit for given specifications.
CO5: Characterize and model the network in terms of all network parameters.

The following experiments need to be performed using both Hardware and simulation Software. The experiments need to be simulated using software and the same need to be verified using the hardware.

1. Study of components of a circuit and Verification of KCL and KVL.

2. Verification of mesh and nodal analysis for AC circuits

3. Verification of Superposition, Thevenin's & Norton theorems for AC circuits

4. Verification of maximum power transfer theorem for AC circuits

5. Verification of Tellegens theorem for two networks of the same topology.

6. Study of DC transients in RL, RC and RLC circuits

7. To study frequency response of various 1st order RL & RC networks

8. To study the transient and steady state response of a 2nd order circuit by varying its various parameters and studying their effects on responses

9. Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit.

10. Determination of open circuit (Z) and short circuit (Y) parameters

11. Determination of hybrid (H) and transmission (ABCD) parameters

12. To measure two port parameters of a twin-T network and study its frequency response.

HARDWARE REQUIREMENTS:

Regulated Power supplies, Analog/Digital Function Generators, Digital Multimeters, Decade Resistance Boxes/Rheostats, Decade Capacitance Boxes, Ammeters (Analog or Digital), Voltmeters (Analog or Digital), Active & Passive Electronic Components.

SOFTWARE REQUIREMENTS:

•Multisim/ Pspice/ Equivalent simulation software tool, Computer Systems with required specifications.

REFERENCE:

•Network Analysis - ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
•Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.

I Year B.Tech. ECE – II Semester

L	T	P	C
0	0	1	0.5

HEALTH AND WELLNESS, YOGA AND SPORTS (25G99201)
(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- 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 balance 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 cardio respiratory 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 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, total ling to 90 marks.
• A student shall be evaluated by the concerned teacher for 10 marks by conducting viva voce on the subject.