GLOBAL INSTITUTE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
COURSE CATALOGUE
REGULATIONS B.TECH – GR - 25
CIVIL ENGINEERING
I YEAR I SEMESTER

Course Code	Course Name	Subject Area	Category	Periods Per Week			Credits	Scheme of Examination Max Marks		
				L	T	P		CIA	SEE	Total
INDUCTION PROGRAM										
THEORY										
MA101BS	Matrices and Calculus	BSC	Foundation	3	1	0	4	40	60	100
DS102ES	C Programming and Data Structures	ESC	Foundation	3	0	0	3	40	60	100
PH103BS	Advanced Engineering Physics	BSC	Foundation	3	0	0	3	40	60	100
ME104ES	Engineering Drawing and Computer Aided Drafting	ESC	Foundation	2	0	2	3	40	60	100
EN106HS	English for Skill Enhancement	HSMC	Foundation	3	0	0	3	40	60	100
PRACTICAL										
ME105ES	Engineering Workshop	ESC	Foundation	0	0	2	1	40	60	100
PH107BS	Advanced Engineering Physics Lab	BSC	Foundation	0	0	2	1	40	60	100
DS108ES	C Programming and Data Structures Lab	ESC	Foundation	0	0	2	1	40	60	100
EN109HS	English Language and Communication Skills Lab	HSMC	Foundation	0	0	2	1	40	60	100
			Total Credits	**14**	**1**	**10**	**20**			

COURSE CONTENT

MATRICES AND CALCULUS								
I Year - I Semester: ECE, CSE, CSE (AI & ML), CSE (Data Science), CE & ME								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
MA101BS	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	**1**	**-**	**4**	**40**	**60**	**100**
Contact Classes: 48	Tutorial Classes: 16	Practical Classes: Nil				**Total Classes: 64**		
Prerequisite: Mathematical Knowledge at the pre-university level								

1. COURSE OVERVIEW

This course Matrices and Calculus is a foundation course of mathematics for all engineering branches. The concepts of Matrices, Eigen Values, Eigen Vectors, Functions of Single and Several Variables, Curve Tracing and Multiple Integrals. This course is applicable for simulations, colour imaging processes, and finding optimal solutions in all fields of industries.

2. COURSE OBJECTIVE

The students will try to Learn:

1) Types of matrices and their properties.
2) The concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
3) Concept of eigenvalues and eigenvectors and to reduce the quadratic form to canonical form.
4) A geometrical approach to the mean value theorems and their application to the mathematical problems.
5) Evaluation of surface areas and volumes of revolutions of curves.
6) A basic idea of tracing geometrical figure of an algebraic equation.
7) Partial differentiation, the concept of total derivative.
8) Finding maxima and minima of a function of two and three variables.
9) Evaluation of multiple integrals and their applications.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Find rank of a matrix by Echelon and Normal Form. Write the matrix representation of a set of linear equations and analyse the solution of the system of equations.
CO 2	Find the Eigen Values and Eigenvectors. Reduce the quadratic form to canonical form using orthogonal transformations. To do verification and Application of Cayley Hamilton Theorem.
CO 3	Solve the applications on the mean value theorems. Expand a function using Taylors Series. Trace a basic geometrical figure of a given curve.
CO 4	Find the extreme values of functions of two variables with / without constraints and to apply Lagrange's Multipliers.
CO 5	Evaluate the multiple integrals, change the order and apply the concept to find areas, volumes.

4. COURSE CONTENT

UNIT - I: Matrices **8 L**

Rank of a matrix by Echelon form and Normal form – Inverse of Non-singular matrices by Gauss-Jordan method. System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations. Gauss Seidel Iteration Method.

UNIT - II: Eigen values and Eigen vectors **10 L**

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

UNIT - III: Single Variable Calculus **10 L**

Limit and Continuous of functions and its properties. Mean value theorems: Rolle 's Theorem – Lagrange's Mean value theorem with their Geometrical Interpretation and applications – Cauchy's Mean value Theorem – Taylor's Series (All the theorems without proof).

Curve Tracing: Curve tracing in cartesian coordinates. Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates).

UNIT - IV: Multivariable Calculus (Partial Differentiation and applications) **10 L**

Definitions of Limit and continuity – Partial Differentiation: Euler's Theorem – Total derivative – Jacobian – Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration) **8 L**

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

5. TEXT BOOKS

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

6. REFERENCE BOOKS

1) Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
3) N.P. Bali and Manish Goyal, A textbook of Engineering Mathematics, Laxmi Publications,
4) Reprint, 2008.
5) H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**2**										**2**	**3**	**2**
CO 2	**2**	**3**										**2**	**2**	**3**
CO 3	**2**	**3**											**2**	**3**
CO 4	**3**	**-**	**1**		**2**								**3**	**-**
CO 5	**3**	**3**			**1**							**2**	**3**	**3**

COURSE CONTENT

C PROGRAMMING AND DATA STRUCTURES								
I Year - I Semester: ECE/CE/ME								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
DS102ES	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	**-**	**-**	**3**	**40**	**60**	**100**
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				**Total Classes: 48**		
Prerequisite: Nil								

1. COURSE OVERVIEW

This course introduces the fundamentals of C programming and the core concepts of data structures, enabling students to develop efficient programs and solve computational problems. Students will gain both theoretical knowledge and practical skills in structured programming, algorithm design, and data handling.

2. COURSE OBJECTIVE

Introduce the importance of programming, C language constructs, program development, data structures, searching and sorting.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	**Describe** the fundamental concepts of computer systems, computing environments, and the structure of a C program including identifiers, data types, operators, and input/output operations.
CO 2	**Apply** control structures, functions, and arrays in C to design structured and modular programs for problem-solving.
CO 3	**Demonstrate** the use of pointers, dynamic memory allocation, and string handling functions in C programming.
CO 4	**Develop** programs using derived data types (structures, unions, enums) and implement file handling operations with text and binary streams.
CO 5	**Analyze and implement** sorting, searching, and basic data structures (linked lists, stacks, queues) for efficient data manipulation and storage.

4. COURSE CONTENT

UNIT - I: **10 L**

Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Software Development.

Introduction to C Language – Background, Simple C programs, Identifiers, Basic data types, Variables, Constants, Input / Output

Structure of a C Program – Operators, Bit-wise operators, Expressions, Precedence and Associatively, Expression Evaluation, Type conversions, Statements

UNIT - II: **10 L**

Statements – if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Recursion.

Designing Structured Programs- Functions, basics, user defined functions, inter function communication, standard functions.

Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays.

UNIT - III: **10 L**

Pointers – Introduction, Pointers for inter function communication, pointers to pointers, compatibility.

Pointer Applications – Passing an array to a function, Memory allocation functions, array of pointers

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion.

UNIT - IV: **10 L**

Derived types – The Typedef, enumerated types, Structures – Declaration, definition and initialization of structures, accessing structures, operations on structures, complex structures.

Unions – Referencing unions, initializers, unions and structures.

Input and Output – Text vs Binary streams, standard library functions for files, converting file types, File programs – copy, merge files.

UNIT-V: **8 L**

Sorting- selection sort, bubble sort, insertion sort.

Searching-linear and binary search methods.

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack applications, Queues-operations, array and linked representations.

5. TEXT BOOKS

1) C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2) Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Fifth Edition, Pearson Education.
3) The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI/Pearson Education.

6. REFERENCE BOOKS

1) C & Data structures – P. Padmanabham, 3rd Edition, B.S. Publications.
2) C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
3) Programming in C – Stephen G. Kochan, III Edition, Pearson Education.
4) C for Engineers and Scientists, H. Cheng, McGraw-Hill International Edition
5) Data Structures using C – A. M. Tanenbaum, Y. Langsam, and M.J. Augenstein, Pearson Education / PHI
6) C Programming & Data Structures, E. Balagurusamy, TMH.
7) C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
8) C & Data structures – E V Prasad and N **B Venkateswarlu, S. Chand & Co.**

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**3**	**1**									**2**		
CO 2	**3**	**3**	**2**	**2**	**2**							**2**		
CO 3	**3**	**3**	**2**	**2**	**2**							**2**		
CO 4	**3**	**3**	**3**	**2**	**2**							**2**		
CO 5	**3**	**3**	**2**	**2**	**2**							**2**		

COURSE CONTENT

ADVANCED ENGINEERING PHYSICS								
I Year - I Semester: CE, ME, ECE, CSE(AIML), CSE(DS) **I Year - II Semester: CSE**								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
PH103BS	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	**-**	**-**	**3**	**40**	**60**	**100**
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				**Total Classes: 48**		
Prerequisite: 10+2								

1. COURSE OVERVIEW

This course provides engineering students with a foundational understanding of key physics concepts relevant to advanced materials, quantum mechanics, modern technologies, and engineering applications. It bridges theory and practical knowledge crucial for material characterization, quantum computing, magnetic and dielectric properties, and photonic technologies.

2. COURSE OBJECTIVE

The students will try to Learn:

1) The crystal structures, defects, and material characterization techniques like XRD and SEM.
2) The fundamental concepts of quantum mechanics and their applications in solids and nanomaterials.
3) The quantum computing principles, quantum gates, and basic quantum algorithms.
4) The properties and applications of magnetic and dielectric materials.
5) To explore the working and applications of lasers and fibre optics in modern technology.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Analyse crystal structures, identify defects, and apply XRD and SEM techniques for material characterization.
CO 2	Apply quantum mechanical principles to explain particle behaviour and energy band formation in solids
CO 3	Understand quantum computing concepts, use quantum gates, and explain basic quantum algorithms.
CO 4	Classify magnetic and dielectric materials and explain their properties, synthesis, and applications.
CO 5	Explain the principles of lasers and fibre optics and their applications in communication and sensing.

4. COURSE CONTENT

UNIT – I:

Crystallography & Materials Characterization: Introduction: Unit cell, space lattice, basis, lattice parameters; crystal structures, Bravais lattices, packing factor: SC, BCC, FCC; Miller indices, inter-planar distance; defects in crystals (Qualitative): point defects, line defects, surface defects and volume defects. concept of nanomaterials: surface to volume ratio, X -ray diffraction: Bragg's law, powder method, calculation of average crystallite size using Debye Scherrer's formula, scanning electron microscopy (SEM): block diagram, working principle.

UNIT – II:

Quantum Mechanics : Introduction, de-Broglie hypothesis, Heisenberg uncertainty principle, physical significance of wave function, postulates of quantum mechanics: operators in quantum mechanics, eigen values and eigen functions, expectation value; Schrödinger's time independent wave equation, particle in a 1D box, Bloch's theorem (qualitative), Kronig-Penney model (qualitative): E-k diagram, effective mass of electron, formation of energy bands, origin of bandgap, classification of solids, concept of discrete energy levels and quantum confinement in nanomaterials.

UNIT - III:

Quantum Computing: Introduction, linear algebra for quantum computation, Dirac's Bra and Ket notation and their properties, Hilbert space, Bloch's sphere, concept of quantum computer, classical bits, Qubits, multiple Qubit system, quantum computing system for information processing, evolution of quantum systems, quantum measurements, entanglement, quantum gates, challenges and advantages of quantum computing over classical computation, quantum algorithms: Deutsch-Jozsa, Shor, Grover.

UNIT - IV:

Magnetic and Dielectric Materials: Introduction to magnetic materials, origin of magnetic moment-classification of magnetic materials, hysteresis, Weiss domain theory of ferromagnetism, soft and hard magnetic materials, synthesis of ferrimagnetic materials using sol-gel method, applications: magnetic hyperthermia for cancer treatment, magnets for EV, Giant Magneto Resistance (GMR) device. Introduction to dielectric materials, types of polarization (qualitative): electronics, ionic & orientation; ferroelectric, piezoelectric, pyroelectric materials and their applications: Ferroelectric Random-Access Memory (Fe-RAM), load cell and fire sensor.

UNIT - V:

Laser and Fibre Optics: Introduction to laser, characteristics of laser, Einstein coefficients and their relations, metastable state, population inversion, pumping, lasing action, Ruby laser, He-Ne laser, CO2 laser, semiconductor diode laser, applications: Bar code scanner, LIDAR for autonomous vehicle. Introduction to fibre optics, total internal reflection, construction of optical fibre, acceptance angle, numerical aperture, classification of optical fibres, losses in optical fibre, applications: optical fibre for communication system, sensor for structural health monitoring.

5. TEXT BOOKS

1) Walter Borchardt-Ott, Crystallography: An Introduction, Springer.
2) Charles Kittel, Introduction to Solid State Physics, John Wiley & Sons, Inc.
3) Thomas G. Wong, Introduction to Classical and Quantum Computing, Rooted Grove

6. REFERENCE BOOKS

1) Jozef Gruska, Quantum Computing, McGraw Hill
2) Michael A. Nielsen & Isaac L. Chuang, Quantum Computation and Quantum Information, Cambridge University Press.
3) John M. Senior, Optical Fiber Communications Principles and Practice, Pearson Education Limited.

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**2**	**2**	**2**	**2**							**3**	**3**	**2**
CO 2	**3**	**3**	**2**	**2**	**2**							**3**	**3**	**3**
CO 3	**3**	**2**	**3**	**2**	**3**							**3**	**3**	**3**
CO 4	**3**	**2**	**2**	**2**	**2**		**2**					**2**	**3**	**2**
CO 5	**3**	**2**	**2**	**3**	**3**		**2**					**3**	**3**	**3**

COURSE CONTENT

ENGINEERING DRAWING AND COMPUTER AIDED DRAFTING								
I Year - I Semester: Common to Civil Engineering and Mechanical Engineering								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
ME104ES	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		2	**-**	**2**	**3**	**40**	**60**	**100**
Contact Classes: 32	Tutorial Classes: Nil	Practical Classes: 32				**Total Classes: 64**		
Prerequisite: Nil								

1. COURSE OVERVIEW

This course offers a comprehensive foundation in Engineering Drawing, blending conventional drawing techniques with computer-aided design tools. It begins with the principles of geometrical constructions, scales, and conic sections, progressing to orthographic projections of points, lines, and planes. Students will explore projections and sectional views of regular solids, along with the development of their surfaces. The curriculum culminates in mastering isometric projections and the conversion between isometric and orthographic views. Emphasis is placed on both manual drafting skills and digital proficiency to prepare students for modern engineering design challenges.

2. COURSE OBJECTIVE

The students will try to Learn:

1) To develop a strong foundation in geometrical constructions, scales, and curves including conic sections and cycloidal paths, essential for precise technical drawing.
2) To develop a strong foundation in geometrical constructions, scales, and curves including conic sections and cycloidal paths, essential for precise technical drawing.
3) To train students in creating accurate projections and sectional views of regular solids, enhancing spatial understanding and CAD proficiency.
4) To impart skills in unfolding 3D objects into 2D layouts, facilitating fabrication and design of engineering components.
5) To equip students with the ability to construct and interpret isometric views and convert between isometric and orthographic projections for comprehensive design communication.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Construct precise geometrical figures and curves such as conic sections and cycloidal paths using conventional drafting techniques
CO 2	Generate accurate orthographic projections of points, lines, and planes using both manual methods and computer-aided drafting tools.
CO 3	Visualize and represent regular solids through sectional and auxiliary views, enhancing their spatial reasoning and CAD proficiency
CO 4	Develop the surfaces of 3D solids like prisms, cylinders, pyramids, and cones to support fabrication and design applications.
CO 5	Create and interpret isometric views of objects and convert between isometric and orthographic projections for effective technical communication.

4. COURSE CONTENT

UNIT – I: Introduction to Engineering Graphics (Conventional)
Principles of Engineering Graphics and their Significance, Geometrical Constructions, Scales, Plain and Diagonal, Conic Sections including the Rectangular Hyperbola, General method only. Cycloid, Epicycloid and Hypocycloid.

UNIT – II: Orthographic Projections (Conventional and Computer Aided)
Principles of Orthographic Projections, Conventions, Projections of Points and Lines, Projections of Plane regular geometric figures. Auxiliary Planes. Computer aided orthographic projections, points, lines and planes. Introduction to Computer aided drafting, views, commands and conics.

UNIT - III: Projections of Regular Solids (Conventional and Computer Aided)
Auxiliary Views, Sections or Sectional views of Right Regular Solids, Prism, Cylinder, Pyramid, Cone, Auxiliary views, Computer aided projections of solids, sectional views.

UNIT - IV: Development of Surfaces (Conventional)
Prism, Cylinder, Pyramid and Cone.

UNIT - V: Isometric Projections (Conventional and Computer Aided)
Principles of Isometric Projection, Isometric Scale, Isometric Views, Conventions, Isometric Views of Lines, Plane Figures, Simple and Compound Solids, Isometric Projection of objects having non, isometric lines. Isometric Projection of Spherical Parts. Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions. Conversion of orthographic projection into isometric view.

Note:
1. The End Semester Examination will be in conventional mode.
2. CIE – I will be in conventional mode.
3. CIE – II will be using Computer.

5. TEXT BOOKS

1) Engineering Drawing, N. D. Bhatt, Charotar, 54th Edition, 2023.
2) Engineering Drawing and graphics Using AutoCAD, T. Jeyapoovan and Vikas, S. Chand and company Ltd., 3rdEdition,2010.

6. REFERENCE BOOKS

1) Engineering Drawing, Basant Agrawal and C.M. Agrawal, McGraw Hill, 3rd Edition, 2019.
2) Engineering Graphics and Design, WILEY, John Wiley and Sons Inc, 3rdEdition, 2020.
3) Engineering Drawing, M. B. Shah and B.C. Rane, Pearson, 2nd Edition, 2009.
4) Engineering Drawing, N. S. Parthasarathy and Vela Murali, Oxford, 1st Edition, 2015.
5) Computer Aided Engineering Drawing, K. Balaveera Reddy, CBS Publishers, 2nd Edition, 2015.

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**3**	**3**		**3**							**1**	**2**	**1**
CO 2	**3**	**3**	**3**	**2**	**3**								**3**	**1**
CO 3	**3**	**3**	**3**		**3**								**2**	**3**
CO 4	**3**	**3**	**3**		**3**								**3**	**3**
CO 5	**3**	**3**	**3**	**3**	**3**	**1**				**3**		**1**	**3**	**3**

COURSE CONTENT

ENGLISH FOR SKILL ENHANCEMENT								
I Year – I Semester: CE, ME, ECE & CSE **I Year - II Semester: CSE (AIML) & CSE(DS)**								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
EN106HS	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	**-**	**-**	**3**	**40**	**60**	**100**
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				**Total Classes: 48**		
Prerequisite: Oxford Advanced Learners Dictionary, Basic Word and Sentence formation								

1. COURSE OVERVIEW

National Education Policy-2020 aims at preparing students with knowledge, skills, values, leadership qualities and initiates them for lifelong learning. It also emphasizes language study and promotion of languages through understanding and proper interpretation. English language is central to the educational eco system. The importance of language as medium of communication for personal, social, official and professional needs to be emphasized for clear and concise expression. Teaching and learning of receptive and productive skills viz., Listening, Speaking, Reading and Writing (LSRW) are to be taught and learnt effectively in the undergraduate Engineering programs. Learners should be encouraged to engage in a rigorous process of learning to become proficient users of English language by adopting a deeply focused and yet flexible approach as opposed to rote learning.

In this connection, suitable syllabus, effective pedagogy, continuous assessments and students' involvement result in productive learning. This course supports the latest knowledge and skill requirements and shall meet specified learning outcomes. The main objectives of English language teaching and learning as medium of communication and for promotion of cultural values are embedded in this syllabus. Efforts are being made in providing a holistic approach towards value-based language learning which equips the learner with receptive as well as productive skills.

The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures in the areas of vocabulary, grammar, reading and writing. For this, the teachers should use the prescribed textbook for detailed study. The students should be encouraged to read the texts leading to reading comprehension. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material.

2. COURSE OBJECTIVE

The students will try to Learn:

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

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Choose appropriate vocabulary in their oral and written communication.
CO 2	Demonstrate their understanding of the rules of functional grammar and sentence structures.
CO 3	Develop comprehension skills from known and unknown passages.
CO 4	Write paragraphs, essays, précis and draft letters.
CO 5	Write abstracts and reports in various contexts.

4. COURSE CONTENT

UNIT-I:

Theme: **Perspectives**

Lesson on 'The Generation Gap' by Benjamin M. Spock from the prescribed textbook titled English for the Young in the Digital World published by Orient Black Swan Pvt. Ltd.

Vocabulary: The Concept of Word Formation -The Use of Prefixes and Suffixes - Words Often Misspelt - Synonyms and Antonyms.

Grammar: Identifying Common Errors in Writing with Reference to Parts of Speech particularly Articles and Prepositions – Degrees of Comparison.

Reading: Reading and Its Importance- Sub Skills of Reading – Skimming and Scanning.

Writing: Sentence Structures and Types -Use of Phrases and Clauses in Sentences Importance of Proper Punctuation- Techniques for Writing Precisely –Nature and Style of Formal Writing.

UNIT-II:

Theme: **Digital Transformation**

Lesson on 'Emerging Technologies' from the prescribed textbook titled English for the Young in the Digital World published by Orient BlackSwan Pvt. Ltd.

Vocabulary: Homophones, Homonyms and Homographs

Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.

Reading: Reading Strategies-Guessing Meaning from Context – Identifying Main Ideas – Exercises for Practice.

Writing: Paragraph Writing – Types, Structures and Features of a Paragraph - Creating Coherence – Linkers and Connectives - Organizing Principles in a Paragraph – Defining- Describing People, Objects, Places and Events – Classifying- Providing Examples or Evidence - Essay Writing - Writing Introduction and Conclusion.

UNIT-III:

Theme: **Attitude and Gratitude**

Poems on 'Leisure' by William Henry Davies and 'Be Thankful' - Unknown Author from the prescribed textbook titled English for the Young in the Digital World published by Orient BlackSwan Pvt. Ltd.

Vocabulary: Words Often Confused - Words from Foreign Languages and their Use in English.

Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.

Reading: Sub-Skills of Reading – Identifying Topic Sentence and Providing Supporting Ideas - Exercises for Practice.

Writing: Format of a Formal Letter-Writing Formal Letters E.g.., Letter of Complaint, Letter of Requisition, Job Application with CV/Resume –Difference between Writing a Letter and an Email - Email Etiquette.

UNIT-IV:

Theme: **Entrepreneurship**

Lesson on 'Why a Start-Up Needs to Find its Customers First' by Pranav Jain from the prescribed textbook titled English for the Young in the Digital World published by Orient BlackSwan Pvt. Ltd.

Vocabulary: Standard Abbreviations in English – Inferring Meanings of Words through Context – Phrasal Verbs – Idioms.

Grammar: Redundancies and Clichés in Written Communication – Converting Passive to Active Voice and Vice-Versa.

Reading: Prompt Engineering Techniques– Comprehending and Generating Appropriate Prompts - Exercises for Practice

Writing: Writing Practices- Note Making-Précis Writing.

UNIT-V:

Theme: **Integrity and Professionalism**

Lesson on 'Professional Ethics' from the prescribed textbook titled English for the Young in the Digital World published by Orient BlackSwan Pvt. Ltd.

Vocabulary: Technical Vocabulary and their Usage– One Word Substitutes – Collocations.

Grammar: Direct and Indirect Speech - Common Errors in English (Covering all the other aspects of grammar which were not covered in the previous units).

Reading: Survey, Question, Read, Recite and Review (SQ3R Method) – Inferring the Meaning and Evaluating a Text- Exercises for Practice

Writing: Report Writing - Technical Reports- Introduction – Characteristics of a Report – Categories of Reports Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Technical Report.

5. TEXT BOOKS

1) Board of Editors. 2025. English for the Young in the Digital World. Orient Black Swan Pvt. Ltd.

6. REFERENCE BOOKS

1) Swan, Michael. (2016). Practical English Usage. Oxford University Press. New Edition.
2) Karal, Rajeevan. 2023. English Grammar Just for You. Oxford University Press. New Delhi.
3) 2024. Empowering with Language: Communicative English for Undergraduates. Cengage Learning India Pvt. Ltd. New Delhi.
4) Sanjay Kumar & Pushp Lata. 2022. Communication Skills – A Workbook. Oxford University Press. New Delhi.
5) Wood,F.T. (2007). Remedial English Grammar. Macmillan.
6) Vishwamohan, Aysha. (2013). English for Technical Communication for Engineering Students. Mc Graw-Hill Education India Pvt. Ltd.

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1									**2**	**3**		**3**		**2**
CO 2									**2**	**3**		**3**		**2**
CO 3									**2**	**3**		**3**		**2**
CO 4									**2**	**3**		**3**		**2**
CO 5									**2**	**3**		**3**		**2**

COURSE CONTENT

ENGINEERING WORKSHOP								
I Year - I Semester: Common to Civil Engineering, Mechanical Engineering, ECE and CSE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
ME105ES	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	**-**	**2**	**1**	**40**	**60**	**100**
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32				**Total Classes: 32**		
Prerequisite: Practical skill								

1. COURSE OVERVIEW

This hands-on workshop course offers foundational training across key engineering trades, blending practical exercises with technical demonstrations. Students will gain proficiency in Carpentry, Fitting, Tin Smithy, Foundry, Welding, House Wiring, and Black Smithy through structured joint-making, moulding, and fabrication tasks. Complementary exposure to Plumbing, Machine Shop operations, Water Plasma cutting, and power tools enhances real-world readiness. Each module emphasizes safety, precision, and craftsmanship to build core industrial skills. The course fosters a multidisciplinary understanding essential for careers in mechanical and construction fields.

2. COURSE OBJECTIVE

The students will try to Learn:

1) To acquire hands-on skills in key trades: Carpentry, Welding, Fitting, House Wiring, Foundry, Tin Smithy, and Black Smithy.
2) To perform essential fabrication techniques including joint making, sand moulding, metal shaping, and electrical installations.
3) To gain exposure to advanced tools and processes in Plumbing, Machine Shop, Water Plasma Cutting, and Wood Working.
4) To emphasize safety, accuracy, and craftsmanship in all practical sessions.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Demonstrate practical skills in core trades such as carpentry, welding, fitting, house wiring, smithy, and foundry through completion of structured exercises.
CO 2	Apply fabrication techniques including joint making, metal shaping, sand moulding, and electrical installations with accuracy and safety.
CO 3	Operate basic and advanced tools used in plumbing, machining, water plasma cutting, and wood working with confidence and care.
CO 4	Interpret technical drawings and instructions to execute trade-specific tasks effectively in workshop settings.
CO 5	Exhibit professional workshop behaviour, including adherence to safety protocols, teamwork, and time management.

4. COURSE CONTENT

1) TRADES FOR EXERCISES:

At least two exercises from each trade:

i. Carpentry: T- Lap Joint, Dovetail Joint, Mortise and Tenon Joint
ii. Fitting: Straight Fitting, V- Fit, and Dovetail Fit
iii. Tin Smithy: Square Tin, Rectangular Scoop and Conical Hopper
iv. Foundry: Preparation of Green Sand Mould using Single Piece and Split Pattern
v. Welding Practice: Arc Welding - Butt Joint and Lap Joint
vi. House wiring: Parallel and Series, Two-way Switch and Tube Light
vii. Black Smithy: Round to Square, Fan Hook and S- Hook

2) TRADES FOR DEMONSTRATION AND EXPOSURE:

Plumbing, Machine Shop, Metal Cutting (Water Plasma), Power tools in construction and Wood Working.

5. TEXT BOOKS

1) Workshop Practice, B. L. Juneja, Cengage Learning India, 1st edition, 2015.
2) Workshop Practice Manual, K. Venkata Reddy, BS Publication,6th Edition, Rpt.2025.

6. REFERENCE BOOKS

1) Workshop Manual, K. Venugopal, Anuradha Publications, 2012th edition, 2012

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**2**	**2**	**1**	**2**							**1**	**3**	**2**
CO 2	**3**	**3**	**2**	**2**	**2**	**2**							**3**	**2**
CO 3	**2**	**3**	**2**	**2**	**2**								**3**	**2**
CO 4	**3**	**3**	**3**		**3**		**2**						**3**	**2**
CO 5		**2**				**3**						**1**	**3**	**2**

COURSE CONTENT

ADVANCED ENGINEERING PHYSICS LABORATORY								
I Year – I Semester: CE, ME, ECE, CSE(AIML), CSE(DS) **I Year - II Semester: CSE**								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
PH107BS	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	**-**	**2**	**1**	**40**	**60**	**100**
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32				**Total Classes: 32**		
Prerequisite: 10+2								

1. COURSE OVERVIEW

This lab course is designed for first-year B.Tech. students providing practical exposure to key concepts in advanced and modern physics through hands-on experiments. This course equips students with essential lab skills in material synthesis, characterization, and advanced technology measurements, supporting their theoretical learning with applicable experimental techniques.

2. COURSE OBJECTIVE

The students will try to Learn:

1) The Practical exposure to advanced concepts in solid-state and modern physics.
2) The synthesize and study the physical properties of materials like semiconductors, ferromagnetic, and ferroelectric substances.
3) The Perform semiconductor characterization using Hall effect and band gap experiments.
4) To explore the working principles of lasers and optical fibers through hands-on experiments.
5) To develop skills in data analysis, interpretation, and scientific reporting.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Synthesize and analyze nanomaterials such as magnetite (Fe_3O_4) using chemical methods.
CO 2	Determine key electrical, magnetic, and optical properties of semiconductors and other functional materials.
CO 3	Characterize semiconductors using Hall effect and energy gap measurement techniques.
CO 4	Demonstrate working knowledge of laser systems and optical fiber parameters through experimental study.
CO 5	Apply scientific methods for accurate data collection, analysis, and technical report writing.

4. LIST OF EXPERIMENTS:

1) Synthesis of magnetite (Fe3O4) powder using sol-gel method.
2) Determination of energy gap of a semiconductor.
3) Determination of Hall coefficient and carrier concertation of a given semiconductor.
4) Determination of magnetic moment of a bar magnet and horizontal earth magnetic field.
5) Study of B-H curve of a ferro magnetic material.
6) Determination of work function and Planck's constant using photoelectric effect.
7) Determination of dielectric constant of a given material.
8) V-I and L-I characteristics of light emitting diode (LED)
9)
   a) Determination of wavelength of a laser using diffraction grating.
   b) Study of V-I & L-I characteristics of a given laser diode.

10)

a) Determination of numerical aperture of a given optical fibre.
b) Determination of bending losses of a given optical fibre.

Note: Any 8 experiments are to be performed

5. REFERENCE BOOK

1) S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S Chand Publishers, 2017.

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**2**	**2**	**2**	**2**							**3**	**3**	**2**
CO 2	**3**	**3**	**2**	**2**	**2**							**3**	**3**	**3**
CO 3	**3**	**3**	**2**	**3**	**3**							**3**	**3**	**3**
CO 4	**3**	**2**	**3**	**2**	**3**							**3**	**3**	**3**
CO 5	**2**	**2**	**2**	**3**	**2**							**3**	**2**	**3**

COURSE CONTENT

C PROGRAMMING AND DATA STRUCTURES LAB								
I Year – I Semester: ECE/CE/ME								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
DS108ES	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	**-**	**2**	**1**	**40**	**60**	**100**
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32				**Total Classes: 32**		
Prerequisite: Nil								

1. COURSE OVERVIEW

The laboratory component of this course provides hands-on experience in implementing the concepts of C programming and data structures. Students will practice problem-solving, program development, debugging, and execution skills. The lab sessions are designed to strengthen theoretical knowledge through practical application.

2. COURSE OBJECTIVE

The students will try to Learn:

1) Introduce the importance of programming, C language constructs, program development, data structures, searching and sorting.

3. COURSE OUTCOMES

After successful completion of the course, students should be able to:

CO 1	Develop modular and readable C Programs
CO 2	Solve problems using strings, functions
CO 3	Handle data in files
CO 4	Implement stacks, queues using arrays, linked lists.
CO 5	To understand and analyze various searching and sorting algorithms.

4. LIST OF EXPERIMENTS

1) Write a C program to find the sum of individual digits of a positive integer.
2) Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
4) Write a C program to find the roots of a quadratic equation.
5) Write a C program to find the factorial of a given integer.
6) Write a C program to find the GCD (greatest common divisor) of two given integers.
7) Write a C program to solve Towers of Hanoi problem.
8) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)
9) Write a C program to find both the largest and smallest number in a list of integers.

10) Write a C program that uses functions to perform the following:
    a) Addition of Two Matrices
    b) Multiplication of Two Matrices
11) Write a C program that uses functions to perform the following operations:
    a) To insert a sub-string in to a given main string from a given position.
    b) To delete n Characters from a given position in a given string.
12) Write a C program to determine if the given string is a palindrome or not
13) Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T.
14) Write a C program to count the lines, words and characters in a given text.
15) Write a C program to generate Pascal's triangle.
16) Write a C program to construct a pyramid of numbers.
17) Write a C program that uses functions to perform the following operations:
    a) Reading a complex number
    b) Writing a complex number
    c) Addition of two complex numbers
    d) Multiplication of two complex numbers
    (Note: represent complex number using a structure.)
18)
    a) Write a C program which copies one file to another.
    b) Write a C program to reverse the first n characters in a file.
    (Note: The file name and n are specified on the command line.)
19)
    a) Write a C program to display the contents of a file.
    b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)
20) Write a C program that uses functions to perform the following operations on singly linked list.:
    i) Creation ii) Insertion iii) Deletion iv) Traversal
21) Write C programs that implement stack (its operations) using
    i) Arrays ii) Pointers
22) Write C programs that implement Queue (its operations) using
    i) Arrays ii) Pointers
23) Write a C program that implements the following sorting methods to sort a given list of integers in ascending order
    i) Bubble sort ii) Selection sort iii)Insertion sort
24) Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
    i) Linear search ii) Binary search

5. TEXT BOOK

1) C Programming & Data Structures, B.A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2) Let us C, Yeswanth Kanitkar.
3) C Programming, Balaguruswamy.

6. REFERENCE BOOK

a) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
b) E. Balagurusamy, Computer fundamentals and C, 2nd Edition, McGraw-Hill
c) Yashavant Kanetkar, Let Us C, 18th Edition, BPB
d) R.G. Dromey, How to solve it by Computer, Pearson (16th Impression)
e) Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
f) Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition
g) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	**3**	**2**			**2**				**1**	**2**		**2**		
CO 2	**3**	**3**	**2**	**2**	**2**				**1**	**2**		**2**		
CO 3	**3**	**3**	**2**	**2**	**2**				**1**	**1**		**2**		
CO 4	**3**	**2**	**2**		**2**				**1**	**1**		**2**		
CO 5	**3**	**3**	**2**	**2**	**3**				**1**	**1**		**2**		

COURSE CONTENT

ENGLISH LANGUAGE & COMMUNICATION SKILLS LABORATORY								
I Year - I Semester: CE, ME, ECE & CSE **I Year - II Semester: CSE (AIML) & CSE(DS)**								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
EN109HS	**Foundation**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	**-**	**2**	**1**	**40**	**60**	**100**
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32				**Total Classes: 32**		
Prerequisite: Computer with Headphones, OALD & Interactive Communication Skills Lab								

1. COURSE OVERVIEW:

The Professional Communication Skills (PCS) Lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations both in formal and informal contexts.

2. COURSE OBJECTIVES:

The students will try to Learn:

1) To facilitate computer-assisted multi-media instruction enabling individualized andindependent language learning
2) To sensitize the students to the nuances of English speech sounds, word accent,intonation and rhythm
3) To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
4) To improve the fluency of students in spoken English and neutralize the impact of dialects.

3. COURSE OUTCOMES:

After successful completion of the course, students should be able to

CO 1	Understand the speech sounds, word accent, intonation and rhythm in day-to-day communication.
CO 2	Understand the nuances of English language through audio- visual experience and group activities.
CO 3	Neutralise their accent for intelligibility.
CO 4	Speak with clarity and confidence which in turn enhances their employability skills.
CO 5	Train students to use language appropriately for public speaking and group discussions.

4. COURRSE CONTENT

Exercise – I

CALL Lab:

Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers- Effective Listening.

Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants – Minimal Pairs- Consonant Clusters- Past Tense Marker and Plural Marker- Testing Exercises.

ICS Lab:

Understand: Spoken vs. Written language- Formal and Informal English.

Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise – II

CALL Lab:

Understand: Structure of Syllables – Word Stress– Weak Forms and Strong Forms – Stress pattern in sentences — Intonation.

Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms- Stress pattern in sentences — Intonation - Testing Exercises.

ICS Lab:

Understand: Features of Good Conversation – Strategies for Effective Communication.

Practice: Situational Dialogues – Role Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise – III

CALL Lab:

Understand: Errors in Pronunciation-Neutralising Mother Tongue Interference (MTI).

Practice: Common Indian Variants in Pronunciation – Differences between British and American Pronunciation -Testing Exercises.

ICS Lab:

Understand: Descriptions- Narrations- Giving Directions and Guidelines – Blog Writing.

Practice: Giving Instructions – Seeking Clarifications – Asking for and Giving Directions – Thanking and Responding – Agreeing and Disagreeing – Seeking and Giving Advice – Making Suggestions.

Exercise – IV

CALL Lab:

Understand: Listening for General Details.

Practice: Listening Comprehension Tests - Testing Exercises.

ICS Lab:

Understand: Public Speaking — Exposure to Structured Talks - Non-verbal Communication- Presentation Skills.

Practice: Making a Short Speech – Extempore- Making a Presentation.

Exercise – V

CALL Lab:

Understand: Listening for Specific Details.

Practice: Listening Comprehension Tests -Testing Exercises.

ICS Lab:

Understand: Group Discussion

Practice: Group Discussion

5. TEXT BOOKS:

1) (2022). English Language Communication Skills – Lab Manual cum Workbook. Cengage Learning India Pvt. Ltd.

6. REFERENCE BOOKS:

1) Shobha, KN & Rayen, J. Lourdes. (2019). Communicative English – A workbook. Cambridge University Press.
2) Kumar, Sanjay & Lata, Pushp. (2019). Communication Skills: A Workbook. Oxford University Press.
3) Board of Editors. (2016). ELCS Lab Manual: A Workbook for CALL and ICS Lab Activities. Orient Black Swan Pvt. Ltd.
4) Vishwa Mohan, Aysha. (2013). English for Technical Communication for Engineering Students.Mc Graw-Hill Education India Pvt. Ltd.

7. SUGGESTED SOFTWARE

1) Cambridge Advanced Learners' English Dictionary with CD.
2) English Pronunciation in Use (Elementary, Intermediate, Advanced) Cambridge UniversityPress.
3) English Vocabulary in Use (Elementary, Intermediate, Advanced) Cambridge University Press.
4) TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).

CO-PO-PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1									**3**	**3**		**3**		**2**
CO 2									**3**	**3**		**3**		**2**
CO 3									**3**	**3**		**3**		**2**
CO 4									**3**	**3**		**3**		**2**
CO 5									**3**	**3**		**3**		**2**