

DEPARTMENT OF

CIVIL

ENGINEERING

VISION OF THE DEPARTMENT

To develop Civil Engineering Department as a Centre of excellence for imparting value based education to the students at undergraduate and post-graduate level to meet industry needs and to develop as a major research center meeting national and international standards.

MISSION OF THE DEPARTMENT

- To impart in-depth and up-to-date knowledge of Civil Engineering concepts with focus on character enhancement, leadership qualities, effective communication, social responsibility and pursuit of lifelong learning and professional development.
- To provide a platform to the students to engage in original innovative research.

**B.TECH.
(CIVIL ENGINEERING)**

B.TECH. (CE)

PROGRAM EDUCATIONAL OBJECTIVES

PEO-I: To provide students with a solid foundation in Basic and Engineering Sciences to understand, analyze and evaluate the information to achieve expertise in core areas of Civil Engineering.

PEO-II: To prepare the students to achieve high level technical expertise in the fields of Civil Engineering and to excel in the design and construction of various components or systems of Civil Engineering and to make the students capable of pursuing higher studies and research.

PEO-III: To establish acquaintance with the practical implementation of the theoretical concepts through laboratories, by bringing the real world into the academics through virtual industry labs and to enhance experimental skills of students beyond curriculum and encouraging them to identify and solve complex engineering problems.

PEO-IV: To equip students with modern professional abilities such as effective communication, collaborative work in diverse teams, ethical decision making, successful management of personal and professional career objectives and passion for continuous development through lifelong learning.

PEO-V: V. To prepare the students to guide their professional development by bringing awareness of professional society activities, professional licensure requirements and opportunities for further education in graduate school

B.TECH. (CE)

PROGRAM OUTCOMES

PO-1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO-2: Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-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.

PO-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.

PO-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.

PO-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

PO-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.

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

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

PO-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.

PO-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.

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

B.TECH. (CE)

PROGRAM SPECIFIC OUTCOMES

PSO-1: Survey, Plot & Plan layout for Civil Engineering Structures and alignment for Canals & Roads.

PSO-2: Analyze the problems related to structural components for Buildings, Pavements and Waterways and recommend suitable measures with appropriate consideration for public health, safety and Environmental sustainability.

PSO-3: Specify, design, supervise, test & evaluate foundations & superstructures for Buildings, Industries. Hydraulic structures, Powerhouses, Highways, Railways, Airways, Water supply systems & Sewage treatment plants.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY HYDERABAD
B.TECH. I YEAR
CIVIL ENGINEERING

I SEMESTER

R22

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT101	Matrices and Calculus	3	1	0	4	4
22BS1PH101	Engineering Physics	3	0	0	3	3
22ES1CS103	C Programming and Data Structures	3	0	0	3	3
22HS1EN101	English for Skill Enhancement	2	0	0	2	2
22PC1CE101	Civil Engineering Materials	2	0	0	2	2
22ES2CS103	C Programming and Data Structures Laboratory	0	0	2	2	1
22HS2EN101	English Language and Communication Skills Laboratory	0	0	2	2	1
22ES2ME101	Engineering Workshop	1	0	2	3	2
22BS2PH101	Engineering Physics laboratory	0	0	2	2	1
22SD5CE101	Elements of Civil Engineering	0	0	2	2	1
22MN6HS101	Induction Programme	2	0	0	2	0
Total		16	1	10	27	20

II SEMESTER

R22

Course Code	Title of the Course	L	T	P/D	CH	C
22BS1MT102	Ordinary Differential Equations and Vector Calculus	2	1	0	3	3
22BS1CH101	Engineering Chemistry	3	0	0	3	3
22ES1CE101	Applied Mechanics	2	1	0	3	3
22PC1CE102	Surveying	3	0	0	3	3
22PC1CE103	Building Construction and Planning	2	0	0	2	2
22ES3CE101	Computer Aided Engineering Graphics	0	0	6	6	3
22PC2CE102	Surveying Laboratory	0	0	2	2	1
22ES2DS101	Python Programming Laboratory	0	0	2	2	1
22BS2CH101	Engineering Chemistry Laboratory	0	0	2	2	1
22MN6HS102	Environmental Science	2	0	0	2	0
Total		14	2	12	28	20

L – Lecture T – Tutorial P – Practical D – Drawing CH – Contact Hours/Week
C – Credits SE – Sessional Examination CA – Class Assessment ELA – Experiential Learning Assessment
SEE – Semester End Examination D-D – Day to Day Evaluation LR – Lab Record
CP – Course Project PE – Practical Examination

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1MT101) MATRICES AND CALCULUS

TEACHING SCHEME		
L	T/P	C
3	1	4

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Matrices, Differentiation, Integration

COURSE OBJECTIVES:

- To know the rank of the matrix and its application to consistency of system of linear equations
- To know Eigen values and Eigen vectors
- To know the nature of Quadratic forms
- To know maximum and minimum of a given function with several variables
- To evaluate multiple integrals and their applications

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Compute the rank of a matrix and analyze the solution of a system of linear equations

CO-2: Calculate Eigen values and Eigen vectors

CO-3: Reduce the quadratic form to its canonical form

CO-4: Solve problems involving Maxima and Minima

CO-5: Evaluate multiple integrals and its applications in areas and volumes

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	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	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

UNIT-I:

Matrices: Types of real matrices, symmetric, skew symmetric and orthogonal matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; Consistency of Homogeneous and Non-Homogeneous equations, LU Decomposition method.

UNIT-II:

Eigen Values and Eigen Vectors: Eigen values and eigenvectors and their properties, Diagonalization of matrices; Cayley-Hamilton Theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton Theorem

UNIT-III:

Complex Matrices and Quadratic Forms: Types of complex matrices; Hermitian; Skew-Hermitian, Unitary Matrices and its properties; Quadratic forms and Nature of the Quadratic Forms, Reduction of Quadratic form to canonical form using Linear Transformation and Orthogonal Transformation.

UNIT-IV:

Functions of Several Variables: Definitions of Limits, Continuity. Partial differentiation: partial derivatives of first and second order, Euler's theorem, Total derivative, Jacobian, Functional dependence, Taylor's theorem of two variables (without proof). Maxima and Minima of two variables, Lagrange's method of undetermined Multipliers.

UNIT-V:

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

TEXT BOOKS:

1. Higher Engineering Mathematics, B. V. Ramana, Tata McGraw Hill, New Delhi, 11th Reprint, 2010
2. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Narosa Publications
3. Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition, John Wiley India Pvt. Ltd.

REFERENCES:

1. Linear Algebra and its Applications, Gilbert Strang, Cengage Publication
2. Matrices, A. R. Vasishtha and A. K. Vasishtha, Krishna's Educational Publishers
3. Engineering Mathematics, N. P. Bali, 4th Edition, Laxmi Publications (P) Ltd.
4. Calculus and Analytic Geometry, G. B. Thomas and R. L. Finney, 9th Edition, Pearson, 2002
5. Linear Algebra and its Applications, David C. Lay, Pearson Education India, 2003

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS1PH101) ENGINEERING PHYSICS

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: 10+2 Physics

COURSE OBJECTIVES:

- To apply the principles of lasers for various laser systems and optical fibers
- To understand basic crystal structures, XRD and defects in solids
- To explore the concepts related to the dielectric materials
- To study the fundamental concepts related to the magnetic materials and superconductors
- To identify the importance of energy materials and nanomaterials

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Explain various aspects of lasers, optical fiber and their applications in diverse fields.

CO-2: Identify different types of crystals, importance of X-ray studies in crystals and realize the importance of crystal defects.

CO-3: Illustrate applications of dielectric materials.

CO-4: Realize the applications of magnetic and superconducting materials.

CO-5: Explore the features and applications of energy materials and nanomaterials.

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	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	1	1	-	1	1	-	1	1		1	-	-
CO-2	3	2	2	1	2	1	-	-	1	1		1	-	-
CO-3	3	2	2	1	-	2	-	-	1	1		1	-	-
CO-4	3	2	1	1	-	1	-	-	1	1		1	-	-
CO-5	3	2	2	1	1	2	2	-	1	1		1	-	-

UNIT-I:

Laser and Fiber Optics:

Lasers: Laser beam characteristics-Three quantum processes (Absorption, Spontaneous emission & Stimulated emission), Lifetime, Metastable state, Population inversion, Pumping methods- Lasing action -Block diagram of laser-Einstein coefficients and their relations, Ruby laser, He-Ne laser, Applications of laser.

Fiber Optics: Introduction to optical fiber- Advantages of optical fibers - Total internal reflection, Construction of optical fiber - Acceptance angle - Numerical aperture-Classification of optical fibers. fiber optic laser - Applications.

UNIT-II:

Crystallography and Defects in Solids: Space lattice, Unit cell, Lattice parameters, Crystal systems, Bravais lattice, Atomic radius, Co-ordination number, Structures and Packing fractions of Simple Cubic, Body Centered Cubic, Face Centered Cubic, Miller Indices for Crystal planes and directions, Inter planar spacing of orthogonal crystal systems, Diffraction of X-rays by crystal planes and Bragg's law, Powder method, Applications of XRD.

Point defects (Vacancies, Interstitial and Impurities) Line imperfections, Edge and Screw dislocation, Burger vector, Surface defects and volume defects (Qualitative Treatment).

UNIT-III:

Dielectric Properties: Electric dipole, Dipole moment, Dielectric constant, Electronic, Ionic polarizations and calculation of their polarizabilities, Orientation Polarization (qualitative), Frequency dependence of Polarization- Internal fields, Clausius – Mossotti equation, Piezo and Ferro electricity.

UNIT-IV:

Magnetic Materials and Superconductors: Permeability, Field intensity, magnetic field induction, Magnetization and Magnetic susceptibility – Origin of magnetic moment, Bohr magneton – Classification of magnetic materials (Dia, Para and Ferro)- Domain theory of ferromagnetism, Hysteresis curve – Soft and Hard magnetic materials – Ferrites and their applications, Superconductivity phenomenon, Meissner effect, Type I and Type II superconductors, Applications of Superconductors.

UNIT-V:

Energy Materials and Nanotechnology:

Energy Materials: Introduction to energy materials, Electrolytes for super capacitors - Rechargeable ion batteries, Solid fuel cells.

Nanotechnology: Introduction, Quantum confinement, Surface to volume ratio, Physical properties, Bottom-up approach: Sol-gel, Top-down approach: Ball milling - Characterization techniques – Average crystallite size using X-ray diffraction pattern, Scanning electron microscopy - Applications of nanomaterials.

TEXT BOOKS:

1. A Text book of Engineering Physics, M. N. Avadhanulu, P. G. Kshirsagar & T. V. S. Arun Murthy, 11th Edition, S. Chand Publications, 2019
2. Engineering Physics, B. K. Pandey and S. Chaturvedi, 2nd Edition, Cengage Learning, 2022
3. Engineering Physics, P. K. Palanisamy, Scitech Publications

REFERENCES:

1. Essentials of Nanoscience & Nanotechnology, K. Narasimha Reddy, Nano Digest, 1st Edition, 2021
2. Fundamentals of Physics, Halliday, Resnick and Walker, 11th Edition, John Wiley & Sons, 2018
3. Introduction to Solid State Physics, A. C. Kittel, Wiley Eastern, 2019
4. Nano Materials, A. K. Bhandhopadhyaya, 1st Edition, New Age International, 2007
5. Energy Materials a Short Introduction to Functional Materials for Energy Conversion and Storage, A. S. Bandarenka, CRC Press, Taylor & Francis Group Energy Materials, Taylor & Francis Group, 1st Edition, 2022

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES1CS103) C PROGRAMMING AND DATA STRUCTURES

TEACHING SCHEME		
L	T/P	C
3	0	3

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To introduce the basics of programming, computing environments
- To understand various C language constructs
- To explore operations and concepts of different data structures
- To know various file operations

COURSE OUTCOMES:

CO-1: Illustrate algorithm, flow chart for a given problem

CO-2: Explore the basics of C and various data types in C

CO-3: Develop modular programs using different language constructs

CO-4: Analyse the basic concepts and different operations on Linear and Non-Linear Data structures

CO-5: Solve a given problem using C language

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	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	PSO-3
CO-1	1	2	2	-	-	-	-	1	1	1	-	1	-	-	-
CO-2	3	2	3	1	2	-	-	-	1	-	-	2	-	-	-
CO-3	3	3	3	2	2	-	-	2	2	2	-	2	-	-	-
CO-4	3	3	2	2	-	-	-		2		-	2	-	-	-
CO-5	3	3	3	2	2	-	-	2	2	2	-	2	-	-	-

UNIT-I:

Algorithm: Flowchart- Structure of C program- Identifiers- Basic data types-Constants-variables- Operators-Expressions- Precedence and order of evaluation.

Input-Output Statements: If and switch statements- Loops- While- Do-while and for Statements- Break- Continue- Goto and Labels- Example C Programs.

UNIT-II:

Functions: basic concepts- parameter passing- storage classes- scope rules- user defined functions- standard library functions- recursive functions- example C programs.

UNIT-III:

Arrays: Basic concepts- one-dimensional and two-dimensional arrays- Character array- string handling functions- example C programs.

Sorting: Selection sort- Bubble sort- Insertion sort.
Searching-Linear and Binary search methods.

UNIT-IV:

Structures: Declaration-Definition and Initialization of Structures-Accessing Structures-Operations on Structures, typedef. Unions- Declaration-Definition and Initialization of Unions.

Pointers: Basic concepts- Pointers and functions- Pointers and strings- Pointers and arrays- Pointers and structures- Self referential structures, Dynamic Memory Allocation-Example C programs.

UNIT-V:

Introduction to Data Structures- Stacks and Queues(Linear, Circular, Dequeue)-ADT-Implementation Using Arrays.

Linked List: Definition, representation, ADT, List of applications, Trees - Definition, representation ADT, List of applications and Graphs - Definition, representation, ADT, List of applications

TEXT BOOKS:

1. Computer Science - A Structured Programming Approach Using C, B. A. Forouzan and R. F. Gilberg, 3rd Edition, Thomson
2. The C Programming Language, B. W. Kernighan, Dennis M. Ritchie, PHI/Pearson Education
3. C Programming and Data Structures, E. Balagurusamy, TMH

REFERENCES:

1. Data Structures Using C, A. S. Tanenbaum, Y. Langsam and M. J. Augenstein, PHI/ Pearson Education
2. Programming in C, Stephen G. Kochan, 3rd Edition, Pearson Education
3. Data Structures and Program Design in C, R. Kruse, C. L. Tondo, B. P. Leung, Shashi M, 2nd Edition, Pearson Education

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22HS1EN101) ENGLISH FOR SKILL ENHANCEMENT

TEACHING SCHEME		
L	T/P	C
2	0	2

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE OBJECTIVES:

- To enhance vocabulary through word formation processes
- To read and comprehend different kinds of texts (tone, tenor, sound, sense, diction, etc. - sub-skills)
- To write clear, concise, and correct sentences and paragraphs to produce appropriate technical prose
- To improve coherence and cohesion in writing and speaking
- To recognize and practice the use of rhetorical elements necessary for the successful practice of scientific and technical communication

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Use vocabulary contextually and effectively

CO-2: Employ reading skills to comprehend different kinds of texts. (tone, tenor, sound, sense, diction, etc.)

CO-3: Apply principles of critical thinking and problem-solving for clarity, conciseness and accuracy of expression in academic and professional communication

CO-4: Demonstrate improved competence in Standard Written English, including grammar, sentence and paragraph structure and coherence, and use this knowledge to accurately communicate technical information

CO-5: Employ appropriate rhetorical patterns of discourse in scientific and technical communication

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	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	1	1	1	1	-	2	1	1	2	3	2	2	-	-
CO-2	2	2	2	2	2	2	2	1	3	3	2	2	-	-
CO-3	2	2	2	2	1	3	2	1	3	3	2	2	-	-
CO-4	1	1	1	1	1	2	2	1	2	3	2	2	-	-
CO-5	1	1	1	1	-	2	1	1	2	2	1	1	-	-

UNIT-I:

1. Reading: On the Conduct of Life by William Hazlitt
2. Grammar: Conjunctions and Prepositions
3. Vocabulary: Word Formation (Affixation, Compounding, Conversion, Blending, Borrowing)
4. Writing: Punctuation, Clauses and Sentences Transitional Devices- Paragraph Writing- Process

UNIT-II:

1. Reading: How I Became a Public Speaker by G.B. Shaw
2. Grammar: Articles, Noun-Pronoun Agreement, Concord
3. Vocabulary: Word Formation- (Prefixes, Suffixes, Root Words)
4. Writing Skills: Principles of Good Writing-Coherence, Cohesion Essay Writing - Descriptive, Argumentative, Expository

UNIT-III:

1. Reading: Muhammad Yunus
2. Grammar: Misplaced Modifiers
3. Vocabulary: Synonyms and Antonyms
4. Writing Skills: Letter Writing- Formal Letters - Letter of Complaint, Letter of Requisition, Email Writing; Email Etiquette

UNIT-IV:

1. Reading: Politics and the English Language by George Orwell
2. Grammar: Cliches, Redundancies
3. Vocabulary: Common Abbreviations
4. Writing Skills: Summary Writing; Job Application; Resume

UNIT-V:**Organizational Patterns for writing**

1. Patterns of Writing: Comparison and Contrast Pattern
2. Patterns of Writing: Cause and Effect Pattern
3. Patterns of Writing: Classification Pattern
4. Patterns of Writing: Problem-Solution Pattern

TEXT BOOKS:

1. Language and Life: A Skills Approach, Orient Black Swan
2. Technical Communication Rebecca E. Burnett, 6th Edition, Cengage Learning

REFERENCES:

1. Communication Skills, Pushplata and Kumar, Sanjay, OU Press, 2015
2. Remedial English Grammar, Wood F. T., Macmillan, 2007
3. Study Writing, Hamp, Liz., Lyons and Heasley, Ben, C U Press, 2006
4. Practical English Usage, Swan, Michael, OU Press, 1995
5. Longman Dictionary of Common Errors, Turton N. D., and Heaton J. B., 1991

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22PC1CE101) CIVIL ENGINEERING MATERIALS

TEACHING SCHEME		
L	T/P	C
2	0	2

EVALUATION SCHEME				
SE	CA	ELA	SEE	TOTAL
30	5	5	60	100

COURSE PRE-REQUISITES: Chemistry

COURSE OBJECTIVES:

- To discuss and understand the characteristics of different building materials
- To understand different applications of building materials in civil engineering
- To understand the different types of coating materials
- To know the modern civil engineering materials

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Classify and characterize the building materials

CO-2: Comprehend various types and applications in civil Engineering construction

CO-3: List the tests on different building materials

CO-4: Identify the different modern civil engineering materials and their application in construction

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	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	PSO-3
CO-1	2	-	2	-	-	1	1	-	-	-	-	-	1	1	1
CO-2	2	-	2	-	-	1	1	-	-	-	-	-	1	1	1
CO-3	2	-	2	-	-	1	1	-	-	-	-	-	1	1	1
CO-4	2	-	2	-	-	1	1	-	-	-	-	-	1	1	1

UNIT-I:

Stones: Stones – Classification and Quarrying – Properties – Structural requirements – Dressing of stones - Tests for stones - Common building stones of India.

UNIT-II:

Tiles and Bricks: Tiles - Types of tiles – Properties – Applications - Brick - Composition of Brick earth – Manufacturing and Properties of Bricks - Tests on Bricks - Classification of Bricks - Fly Ash Bricks – Cellular Light Weight Concrete (CLC) Bricks – Autoclaved Aerated Concrete (AAC) Bricks - Composition and Manufacturing – Applications.

UNIT-III:

Lime, Cement, Wood: Lime - Ingredients of lime – Classification – Manufacturing - Cement - Composition of Cement and their Functions - Wood – Structure – Types and Properties – Seasoning - Methods

UNIT-IV:

Steel and Glass: Steel – Composition - Properties of Mild Steel - Defects in Steel - Market forms of Steel - Mechanical treatment of Steel - Glass – Composition – Properties and Applications -Paints - Characteristics of an Ideal Paint- Types and Applications

UNIT-V:

Modern Materials for Construction: Asphalt – Bitumen – Gypsum - Heat Insulating Materials - Recycled Aggregates - Smart Materials - Composite Materials - Types and Applications

TEXT BOOKS:

1. Building Materials, S. K. Duggal, New Age International Publishers
2. Engineering Materials (Material Science), S. C. Rangwala, Charotar Publishing House Pvt. Ltd.

REFERENCES:

1. Building Materials Products, Properties and Systems, M. L. Gambhir, Neha Jamwal, Tata McGraw Hill Education Pvt. Ltd.
2. Materials Science and Engineering - An Introduction, William D. Callister, Jr., John Wiley and Sons
3. Building Materials and Construction, Dr. Anil Kumar Misra, S. Chand Publishers

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/105106206>
2. <https://nptel.ac.in/courses/105102088>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2CS103) C PROGRAMMING AND DATA STRUCTURES LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To gain a working knowledge of C programming to write modular, efficient and readable C programs by Identifying the structural elements and layout of C source code
- To use different basic and derived data types
- To understand the concept of modular programming
- To identify various operations on data structures

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Use various data types and apply basic concepts of the language for a specified problem

CO-2: Choose appropriate language constructs to develop a solution for a given problem

CO-3: Execute the programs using modular approach

CO-4: Implement various operations of a given data structure

CO-5: Solve a given problem using C language

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	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	PSO-3
CO-1	2	2	-	-	-	-	-	-	-	-	-	1	-	-	-
CO-2	2	2	2	1	-	-	-	-	-	-	-	2	-	-	-
CO-3	2	2	1	2	1	-	-	-	2	1	-	2	-	-	-
CO-4	2	2	1	2		-	-	-	2	1	-	2	-	-	-
CO-5	2	2	2	2	1	-	-	2	2	1	-	2	-	-	-

LIST OF PROGRAMS:

WEEK 1:

Small programs on input output statements

Small programs on various types of operators

WEEK 2:

Small but tricky codes on decision making statements(If, If-else, Nested If-Else, Else if Ladder, Switch.

Programs using loops (goto, while, do..while, for)

Programs to understand difference between Break and Continue

WEEK 3:

Programs on proper parameter passing techniques

Programs to understand storage classes
Programs using recursion

WEEK 4:

Programs on 1-D arrays
Programs on 2-D arrays

WEEK 5:

Programs on strings
Programs using string handling functions

WEEK 6:

Programs on searching and sorting

WEEK 7:

LAB INTERNAL-1

WEEK 8:

Programs using structures, Unions

WEEK 9:

Simple Programs using pointers

WEEK 10:

Programs using pointers on arrays, strings
Programs using pointers on structures

WEEK 11:

Program to implement stacks using arrays

WEEK 12:

Program to implement Linear queue using arrays

WEEK 13:

Program to implement Circular and Dequeue using arrays.

WEEK 14:

LAB INTERNAL-2

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22HS2EN101) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To train students to use neutral accent through phonetic sounds, symbols, stress and intonation
- To provide practice in vocabulary usage & grammatical construction
- To provide ample practice in LSRW skills and train the students in oral presentations, public speaking, role play, and situational dialogue
- To provide practice in defining technical terms and describing processes
- To equip students with excellent writing skills and information transfer skills

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Speak fluently with a neutral accent

CO-2: Use contextually apt vocabulary and sentence structures

CO-3: Make Presentations with great confidence

CO-4: Define technical terms and describe processes

CO-5: Write accurately, coherently, and lucidly

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	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	1	1	-	-
CO-2	1	1	1	1	3	1	1	1	2	3	1	1	-	-
CO-3	1	1	-	-	-	2	2	-	3	3	3	1	-	-
CO-4	2	2	2	2	-	2	2	-	2	3	1	1	-	-
CO-5	1	1	1	1	-	2	1	-	2	3	2	1	-	-

LIST OF EXERCISES:

1. Self-Introduction
2. Phonetics- Identifying sounds-Word stress- Intonation
3. Reading Comprehension – Reading for Gist & for Specific Details; Making inferences
4. Story Telling
5. Making Short Oral Presentations
6. Listening Comprehension- Listening for Global meaning & specific details; note taking
7. Learning vocabulary from context
8. Book Review
9. Writing Resume and CV
10. Information Transfer

11. Social Media Skills – Writing a Blog
12. Defining Technical Terms and Describing Processes

TEXT BOOKS:

1. Technical Communication, Rebecca E. Burnett, 6th Edition, Cengage Learning

REFERENCES:

1. Practical English Usage, Swan, Michael, Oxford University Press, 1995
2. Remedial English Grammar, F. T. Wood, Macmillan, 2007
3. Exercises in Spoken English, Parts I-III, CIEFL, Hyderabad, Oxford University Press
4. Fowler's Modern English Usage-Revised, R. W. Burchfield
5. Technical Communication, Raman, Meenakshi and Sharma, Sangeeta, Oxford University Press, 2005

ONLINE RESOURCES:

1. <https://caw.ceu.edu/academic-skills>
2. <https://www.biz-e-training.com/resources-for-learners/academic-writing-online-resources/>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22ES2ME101) ENGINEERING WORKSHOP

TEACHING SCHEME		
L	T/P	C
1	2	2

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To know the different popular manufacturing process
- To gain a good basic working knowledge required for the production of various engineering products
- To provide hands on experience about use of different engineering materials, tools, equipment and processes those are common in the engineering field
- To identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances

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

CO-1: Understand various types of manufacturing processes.

CO-2: Fabricate/make components from wood and steels through hands on experience.

CO-3: Understand different machining processes like turning, drilling, tapping, etc.

CO-4: Understand electrical and electronic components and their assembly.

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	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	2	2	2	2	1	2	1	3	2	1	2	3	2
CO-2	2	1	2	2	2	1	2	1	3	2	1	2	3	2
CO-3	2	2	2	2	2	1	2	1	3	2	1	2	3	2
CO-4	2	1	2	2	2	1	2	1	3	2	1	2	3	2

LECTURES & VIDEOS:

1. Manufacturing Methods - Casting, Forming, Machining, Joining, Advanced Manufacturing Methods
2. CNC Machining, Additive Manufacturing
3. Fitting Operations & Power Tools
4. Electrical & Electronics
5. Carpentry
6. Plastic Moulding, Glass Cutting
7. Welding (Arc Welding & Gas Welding), Brazing
8. Power Tools
9. Printed Circuit Boards

LIST OF EXPERIMENTS:

- I. Carpentry**
 - i. Cross lap joint
 - ii. Mortise & tenon joint

- II. Fitting**
 - i. Square fitting
 - ii. L-fitting

- III. Arc Welding**
 - I. Butt joint
 - II. Lap joint

- IV. Smithy**
 - i. Rectangular Tray (Tin smithy)
 - ii. U-hook (Black smithy)

- V. Electrical & Electronics**
 - i. Single lamp connection & Stair case connection
 - ii. Soldering and de-soldering on a PCB.

- VI. Machine Shop**
 - i. Step turning on lathe
 - ii. Drilling & tapping

TEXT BOOKS:

1. Workshop Manual, P. Kannaiah and K. L. Narayana, 3rd Edition, Scitech, 2015
2. Elements of Workshop Technology Vol.1 & 2, S. K. Hajra Choudhury, A. K. Hajra Choudhury and Nirjhar Roy, 13th Edition, Media Promoters & Publishers Pvt. Ltd., 2010
3. Printed Circuit Boards - Design, Fabrication, Assembly and Testing, R. S. Khandpur, Tata McGraw-Hill Education, 2005

REFERENCES:

1. Manufacturing Engineering and Technology, Serope Kalpakjian, Steven R. Schmid, 4th Edition, Pearson Education India Edition, 2002
2. Manufacturing Technology-I, S. Gowri, P. Hariharan and A. Suresh Babu, Pearson Education, 2008
3. Processes and Materials of Manufacture, Roy A. Lindberg, 4th Edition, Prentice Hall India, 1998
4. Manufacturing Technology Vol-1 & 2, P. N. Rao, Tata McGraw-Hill House, 2017

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22BS2PH101) ENGINEERING PHYSICS LABORATORY

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME					
D-D	PE	LR	CP	SEE	TOTAL
10	10	10	10	60	100

COURSE OBJECTIVES:

- To understand the working principle of lasers and optical fibers.
- To analyze the characteristics of semiconductor devices and resonance phenomena
- To measure the time constant of RC circuit and dielectric constant of material
- To study the behavior of magnetic materials and understand least square method
- To compare the experimental results with the classroom learning

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Demonstrate the total internal reflection in optical fiber using lasers.

CO-2: Realize importance of optoelectronics and resonance in daily life.

CO-3: Illustrate discharging of a capacitor and polarizability of dielectric material.

CO-4: Identify the importance of least square fitting and applications of magnetic materials.

CO-5: Correlate the experimental results with the classroom learning.

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)	
	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	1	-	-	1	1	-	2	1	-	2	-	-
CO-2	3	2	2	1	-	1	1	-	2	1	-	2	-	-
CO-3	3	2	2	-	-	1	1	-	2	1	-	2	-	-
CO-4	3	2	1	1	-	1	1	-	2	1	-	2	-	-
CO-5	3	2	1	-	-	1	1	1	2	1	-	2	-	-

LIST OF EXPERIMENTS:

1. Torsional pendulum: understanding the method of least squares.
2. Determination of acceptance angle and numerical aperture of an optical fiber.
3. Determination of wavelength of given LASER using grating.
4. Determine the width of given wire- using LASER
5. Determination of the beam divergence of a given LASER.
6. V-I characteristics of light emitting diode (LED)
7. V-I Characteristics of solar cell.
8. Measurement of dielectric constant.
9. Study the B-H curve of magnetic material.
10. Determination of time constant of RC circuit.
11. Melde's Experiment
12. AC frequency sonometer

TEXT BOOKS:

1. Engineering Physics Laboratory Manual/Observation, Physics Faculty of VNRVJIE
2. A Textbook of Practical Physics, S. Balasubramanian, M. N. Srinivasan, S. Chand Publishers, 2017

ONLINE RESOURCES:

1. <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>
2. <https://vlab.amrita.edu/index.php?sub=1&brch=280&sim=1518&cnt=1>

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. I Semester

(22SD5CE101) ELEMENTS OF CIVIL ENGINEERING

TEACHING SCHEME		
L	T/P	C
0	2	1

EVALUATION SCHEME						
D-D	PE	LR	CP	VV	SEE	TOTAL
10	10	10	10	10	-	50

COURSE OBJECTIVES:

- To know the various minerals and rocks used in construction and their importance
- To understand the different physical tests conducted on cement as per Indian Standard (IS) specifications
- To know the physical tests on fine aggregate and coarse aggregate for construction as per IS code
- To understand the mechanical requirements of coarse aggregate as pavement material as per the IS code

COURSE OUTCOMES: After completion of the course, the student should be able to

CO-1: Identify different minerals and rocks used in construction

CO-2: Conduct various physical tests on cement as per IS codal specifications

CO-3: Determine the physical properties of fine aggregate and verify their requirement as per IS code

CO-4: Check the suitability of coarse aggregate for pavement construction as per IS codal specifications

COURSE ARTICULATION MATRIX:

(Correlation of Course Outcomes with Program Outcomes and Program Specific Outcomes using mapping levels 1 = Slight, 2 = Moderate and 3 = Substantial)

CO	PROGRAM OUTCOMES (PO)												PROGRAM SPECIFIC OUTCOMES (PSO)		
	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	PSO-3
CO-1	2	1	1	2	-	-	-	1	2	2	-	-	1	1	2
CO-2	2	1	2	3	-	-	-	2	2	2	-	-	1	1	2
CO-3	2	1	2	3	-	-	-	2	2	2	-	-	1	1	2
CO-4	2	1	3	3	-	-	-	2	2	2	-	-	1	1	2

LIST OF EXPERIMENTS:

1. **Identification of Minerals:** Silica Group, Feldspar Group, Crystalline Group, Carbonate Group, Pyroxene Group, Mica Group, Amphibole Group.
2. **Identification of Rocks:** Igneous Petrology, Sedimentary Petrology, Metamorphic Petrology.
3. Tests on Cement
 - a) Specific Gravity
 - b) Consistency
 - c) Setting times
4. Tests on Fine Aggregates
 - a) Specific Gravity
 - b) Bulking of Sand
 - c) Fineness Modulus

5. Tests on Coarse Aggregate
 - a) Specific Gravity
6. Tests on Aggregates for Pavements
 - a) Flakiness and Elongation Index
 - b) Aggregate Impact Value
 - c) Aggregate Crushing Value

TEXT BOOKS:

1. Textbook of Engineering Geology, N. Chenna Kesavulu, 3rd Edition, Trinity Press
2. Engineering and General Geology, Parbin Singh, Katson Educational Series
3. Concrete Technology, A. M. Neville and J. J. Brooks, Prentice Hall Publication

REFERENCES:

1. Concrete Technology, M. S. Shetty, S. Chand & Co. Publication
2. IS: 269 - 2015 (Reaffirmed 2020), Ordinary Portland Cement - Specification (Sixth Revision), Bureau of Indian Standards, New Delhi, 2015
3. IS: 383 - 2016, Coarse and Fine Aggregate for Concrete - Specification (Third Revision), Bureau of Indian Standards, New Delhi, 2016