GLOBAL INSTITUTE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
COURSE CATALOGUE
REGULATIONS B.TECH – GR - 24
CIVIL ENGINEERING
II 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
THEORY										
MA301BS	Probability and Statistics	BSC	Foundation	3	1	0	4	40	60	100
CE302PC	Building Materials, Construction and Planning	PCC	Core	3	0	0	3	40	60	100
CE303PC	Engineering Geology	PCC	Core	3	0	0	3	40	60	100
CE304PC	Strength of Materials–I	PCC	Core	3	0	0	3	40	60	100
CE305PC	Fluid Mechanics	PCC	Core	3	0	0	3	40	60	100
PRACTICAL										
CE306PC	Surveying Laboratory-II	PCC	Core	0	1	2	2	40	60	100
CE307PC	Strength of Materials Laboratory	PCC	Core	0	0	2	1	40	60	100
CE308PC	Computer Aided Drafting Laboratory	PCC	Core	0	0	2	1	40	60	100
MANDATORY COURSE										
*MC309	Gender Sensitization Laboratory	MC-III	MC	0	0	2	0			
			Total Credits	**15**	**2**	**8**	**20**			

PROBABILITY & STATISTICS							
II Year - I Semester: CE							
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MA301BS	**Foundation**	3	1	-	4	40	60	100
Contact Classes: 48	Tutorial Classes: 16	Practical Classes: Nil				**Total Classes: 64**		
Prerequisite: Mathematics courses of the first year of study.								

1. COURSE OVERVIEW

Probability and Statistics is a foundational course designed to equip Civil Engineering students with essential statistical and probabilistic tools used in engineering analysis, planning, and decision-making. The course emphasizes the practical application of these mathematical concepts to solve real-world problems encountered in civil engineering domains such as structural analysis, transportation engineering, geotechnical engineering, environmental systems, and construction management.

2. COURSE OBJECTIVE

The students will try to Learn:

1) The theory of Probability, and probability distributions of single and multiple random variables
2) The sampling theory and testing of hypotheses and making statistical inferences.
3) The curve fitting, correlation and regression for the given data.

3. COURSE OUTCOMES

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

CO 1	Apply the concepts of Random variables and distributions to some case studies.
CO 2	Correlate the concepts of one unit to the concepts in other units.
CO 3	Understand sampling theory and apply hypothesis testing in real-world scenarios.
CO 4	Test a hypothesis on single and double means. Estimating the ratio of two Variances
CO 5	Fit the curve, correlation and regression for the given data.

4. COURSE CONTENT

UNIT - I: Probability   **8 L**
Sample Space, Events, Counting Sample Points, Probability of an Event, Additive Rules, Conditional Probability, Independence, and the Product Rule, Bayes' Rule.
Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions.

UNIT - II: Expectation and Discrete Distributions   **10 L**
Mean of a Random Variable, Variance and Covariance of Random Variables, Means and Variances of Linear Combinations of Random Variables, Chebyshev's Theorem.
Discrete Probability Distributions: Binomial Distribution, Poisson Distribution.

UNIT - III: Continuous Distributions and Sampling   **10 L**
Uniform Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial Distributions.

Fundamental Sampling Distributions: Random Sampling, Some Important Statistics, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, t-Distribution, F-Distribution.

UNIT - IV: Estimation & Tests of Hypotheses   10 L

Introduction, Statistical Inference, Classical Methods of Estimation, Single Sample: Estimating the mean, standard error of a point estimate, prediction interval. Two samples: Estimating the difference between two means, Single sample: Estimating a proportion, Two samples: Estimating the difference between two proportions, Two samples: Estimating the ratio of two variances.

Statistical Hypotheses: General Concepts, Testing a Statistical Hypothesis, Single sample: Tests concerning a single mean, Two samples: tests on two means, One sample: test on a single proportion. Two samples: tests on two proportions, Two-sample tests concerning variances.

UNIT-V: Applied Statistics   10 L

Curve fitting by the method of least squares, fitting of straight lines, second degree parabolas and more general curves, Correlation and regression, Rank correlation.

5. **TEXT BOOKS**

    1) Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
    2) S C Gupta & V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.

6. **REFERENCE BOOKS**

    1) T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
    2) Sheldon M Ross, Probability and Statistics for Engineers and Scientists, academic press

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

BUILDING MATERIALS, CONSTRUCTION AND PLANNING							

II Year - I Semester: CE

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CE302PC	**Core**	3	-	-	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				**Total Classes: 48**		
Prerequisite:								

1. COURSE OVERVIEW

The Building Materials, Construction and Planning course introduces students to essential construction materials like cement, bricks, aggregates, timber, steel, and modern alternatives. It covers material properties, testing methods, and suitability for various structural applications. The course also explores construction techniques, masonry work, foundation types, and concrete technology. Emphasis is placed on building planning principles, including orientation, ventilation, and functional design. Students gain foundational knowledge for effective material selection and construction planning in civil engineering projects.

2. COURSE OBJECTIVE

The students will try to Learn:

1) List the construction material.
2) Explain different construction techniques
3) Understand the building bye-laws
4) Highlight the smart building materials

3. COURSE OUTCOMES

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

CO 1	**Understand** construction materials, their classification and structural requirements.	Understand
CO 2	**Understand** the different component parts of building and their construction practices and techniques.	Understand
CO 3	**Understand** the functional requirements to be considered for design and construction of building.	Understand
CO 4	**Identify** the factors to be considered in planning and construction of buildings.	Understand
CO 5	**Understand** the planning aspects of a building based on the factors and principles of planning.	Understand

4. COURSE CONTENT

UNIT - I:

Stones and Bricks, Tiles: Building stones – classifications and quarrying – properties – structural requirements – dressing.

Bricks – Composition of Brick earth – manufacture and structural requirements, Fly ash, Ceramics.

Timber, Aluminium, Glass, Paints and Plastics: Wood - structure – types and properties – seasoning– defects; alternate materials for Timber – GI / fiber– reinforced glass bricks, steel & aluminum, Plastics.

UNIT - II:

Cement & Admixtures: Ingredients of cement – manufacture – Chemical composition – Hydration - field & lab tests.

Admixtures – mineral & chemical admixtures – uses.

UNIT - III:

Building Components: Lintels, Arches, walls, vaults – stair cases – types of floors, types of roofs – flat, curved, trussed; foundations – types; Damp Proof Course; Joinery – doors – windows – materials types.

Building Services: Plumbing Services: Water Distribution, Sanitary – Lines & Fittings; Ventilations: Functional requirements systems of ventilations. Air-conditioning - Essentials and Types; Acoustics – characteristic – absorption – Acoustic design; Fire protection – Fire Hazards – Classification of fire- resistant materials and constructions

UNIT - IV:

Mortars, Masonry and Finishing's Mortars: Cement Mortar, Brick masonry – types – bonds; Stone masonry – types; Composite masonry – Brick-stone composite; Concrete, Reinforced brick.

Finishers: Plastering, Pointing, Painting, Claddings – Types – Tiles – ACP.

Form work: Types: Requirements – Standards – Scaffolding – Design; Shoring, Underpinning.

UNIT-V:

Building Planning: Classification of buildings, functional Planning of buildings: Sustainability and concept of Green building, General aspects to consider for planning, bye-laws and regulations, Selection of site for building construction, Principles of planning, Orientation of building and its relation to outside environment.

5. **TEXT BOOKS**

   1) Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications.
   2) Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2015.
   3) Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi

6. **REFERENCE BOOKS**

   1) Building Materials by Duggal, New Age International.
   2) Building Materials by P. C. Varghese, PHI.
   3) Building Construction by PC Varghese PHI.
   4) Construction Technology – Vol – I & II by R. Chubby, Longman UK.
   5) Alternate Building Materials and Technology, Jagadish, Venkatarama Reddy and others; New Age Publications.

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		1						3	2	3
CO 2	3			1	1		1					3	2	3
CO 3	3		3		1	1			2			3	2	2
CO 4	3			1	1				2			3	2	2
CO 5	3					1			2			3	2	2

ENGINEERING GEOLOGY

II Year - I Semester: CE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CE303PC	**Core**	**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:								

1. COURSE OVERVIEW

This course provides a foundational understanding of geology and its significance in civil engineering projects. It covers the weathering of rocks, mineralogy, and the formation of minerals, along with an introduction to petrology and structural geology. Emphasis is placed on the importance of in-situ investigations for site assessment and construction planning. The course also examines earthquakes and their impact on structures. Additionally, students learn the importance of geophysical studies in subsurface exploration and hazard mitigation.

2. COURSE OBJECTIVE

The students will try to Learn:

1) To give the basics knowledge of Geology that is required for constructing various Civil Engineering Structures, basic Geology, Geological Hazardous and Environmental Geology.
2) To focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation. Planning and construction of major Civil Engineering projects.

3. COURSE OUTCOMES

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

CO 1	**Understand** the effect of weathering in rocks in dams reservoirs and tunnels.	Understand
CO 2	**Understand** the physical properties of rocks and minerals	Understand
CO 3	**Understand** the common geological structure of rocks	Understand
CO 4	**Understand** the principle of geophysical studies on rocks and minerals	Understand
CO 5	**Understand** the geological considerations in selection of site for dams, tunnels and reservoirs	Understand

4. COURSE CONTENT

UNIT – I:
Introduction: Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological draw backs. Importance of Physical geology, Petrology and Structural geology.

Weathering of Rocks: Its effect over the properties of rocks importance of weathering with reference to dams, reservoirs and tunnels weathering of common rock like "Granite"

UNIT – II:

Mineralogy: Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of other common economics minerals such as Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.

Petrology: Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of igneous. Sedimentary and metamorphic rocks. Their distinguishing features, Megascopic and microscopic and microscopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT - III:

Structural Geology: Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults unconformities, and joints - their important types and case studies. Their importance Insitu and drift soils, common types of soils, their origin and occurrence in India, Stabilization of soils. Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration.

UNIT - IV:

Earth Quakes: Causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Landslides, their causes and effect; measures to be taken to prevent their occurrence

Importance of Geophysical Studies: Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods and geothermal method. Special importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc. Fundamental aspects of Rock mechanics and Environmental Geology.

UNIT - V:

Geology of Dams, Reservoirs, and Tunnels: Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factors contributing to the success of a reservoir. Geological factors influencing water Lightness and life of reservoirs - Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (i.e. Tithological, structural and ground water) in tunneling over break and lining in tunnels.

5. **TEXT BOOKS**
   1) Engineering Geology by N. Chennakesavulu, McMillan, India Ltd. 2005
   2) Engineering Methods by D. Venkat Reddy; Vikas Publishers 2015.
   3) Engineering Geology by S K Duggal, H K Pandey Mc Graw Hill Education Pvt Ltd 2014
   4) Principles of Engineering Geology by K.V.G.K. Gokhale – B.S publications

6. **REFERENCE BOOKS**
   1) F.G. Bell, Fundamental of Engineering B.S. Publications, 2005.
   2) Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution.
   3) Engineering Geology by Subinoy Gangopadhyay, Oxford university press.
   4) Engineering Geology for Civil Engineers – P.C. Varghese PHI

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								1			2	2	2
CO 2	2								1			2	2	2
CO 3	2											2	2	2
CO 4	2			1								2	2	2
CO 5	2		1	1					1			2	2	2

STRENGTH OF MATERIALS – I							
II Year - I Semester: CE							
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CE304PC	**Core**	**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:								

1. COURSE OVERVIEW

Strength of Materials is a foundational course in civil engineering that focuses on analyzing how different materials behave under various types of loads. It covers concepts like stress, strain, elasticity, and deformation in structural elements such as beams, columns, and shafts. The course introduces bending moments, shear forces, torsion, and axial loading. It also explores material properties, failure theories, and safety factors. This knowledge is crucial for designing safe and efficient structures.

2. COURSE OBJECTIVE

The students will try to Learn:

1) To understand the nature of stresses developed in simple geometries such as bars, cantilevers and beams for various types of simple loads.
2) To calculate the elastic deformation occurring in simple members for different types of loading.
3) To show the plane stress transformation with a particular coordinate system for different orientation of the plane.
4) To know different failure theories adopted in designing of structural members.

3. COURSE OUTCOMES

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

CO 1	**Apply** the fundamental concepts of stress, strain, and their relationship through Hooke's law for different types of materials.	Apply
CO 2	**Calculate** the Shear Force and Bending Moment for a given beam under different loading conditions	Apply
CO 3	**Calculate** bending and shear stresses across various sections of beams	Apply
CO 4	**Calculate** the slope and deflection of various beams subjected to different loading conditions	Apply
CO 5	Normal and tangential stresses in an oblique plane and understand various theories of failures	Apply

4. COURSE CONTENT

UNIT – I:
Simple Stresses and Strains: Concept of stress and strain- St. Venant's Principle-Stress and Strain Diagram- Elasticity and plasticity– Types of stresses and strains - Hooke's law– stress – strain diagram for mild steel–Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain - Pure shear and Complementary shear - Elastic modulii, Elastic constants and the relationship between them–Bar so varying section–composite bars–Temperature stresses.
Strain Energy–Resilience–Gradual, sudden, and impact loadings – simple applications

UNIT – II:

Shear Force and Bending Moment: Types of beams–Concept of shear force and bending moment- S.F and B.M diagrams for cantilever, simply supported including overhanging beams subjected to point loads, uniformly distributed load, uniformly varying load, couple and combination of these loads–Point of contraflexure–Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT - III:

Flexural Stresses: Theory of simple bending – Assumptions–Derivation of bending equation- Section Modulus Determination of flexural/bending stresses of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections–Design of simple beam sections.

Shear Stresses: Derivation of formula for shear stress distribution – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T, angle and channel sections.

UNIT - IV:

Deflection of Beams: Slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L, Uniformly varying load and couple - Mohr's theorems – Moment area method–Application to simple cases.

Conjugate Beam Method: Introduction – Concept of conjugate beam method - Difference between areal beam and a conjugate beam - Deflections of determinate beams with constant and different moments of inertia.

UNIT - V:

Principal Stresses: Introduction – Stresses on an oblique plane of a bar under axial loading – compound stresses–Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear - Principal stresses – Mohr's circle of stresses–ellipse of stress-Analytical and graphical solutions.

Theories of Failure: Introduction–Various theories of failure-Maximum Principal Stress Theory, Maximum Principal Strain Theory, Maximum shear stress theory- Strain Energy and Shear Strain Energy Theory (VonMises Theory).

5. **TEXT BOOKS**
   1) Strength of Materials by R. K Rajput, S. Chand & Company Ltd.
   2) Mechanics of Materials by Dr.B.C Punmia, Dr.Ashok Kumar Jain and Dr. Arun Kumar Jain
   3) Strength of Materials by R. Subramanian, Oxford University Press

6. **REFERENCE BOOKS**
   1) Mechanics of materials by R. C. Hibbeler, Prentice Hall publications
   2) Engineering Mechanics of Solids by Egor P. Popov, Prentice Hall publications
   3) Strength of Materials by T. D. Gunneswara Rao and M. Andal, Cambridge Publishers
   4) Strength of Materials by R.K.Bansal, Lakshmi Publications House Pvt Ltd.
   5) Strength of Materials by B.S.Basavarajaiah and P.Mahadevappa, 3rd Edition, University Press.

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			2	2	2
CO 2	3	2		3	2	2	2		2			2	2	2
CO 3	3	2		2		2			2			2	2	2
CO 4	3				2							2	2	2
CO 5	3											2	2	2

FLUID MECHANICS							
II Year - I Semester: CE							
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
CE305PC	**Core**	3	-	-	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				**Total Classes: 48**		
Prerequisite:							

1. COURSE OVERVIEW

The Fluid Mechanics course provides a fundamental understanding of fluid properties, behavior, and dynamics. It covers fluid statics, kinematics, and dynamics, including the application of Bernoulli's and Euler's equations. Students learn about flow through pipes, dimensional analysis, and boundary layer concepts. The course also includes practical aspects like measurement of flow and fluid forces on surfaces. It builds the analytical skills necessary for solving real-world fluid flow problems in civil engineering.

2. COURSE OBJECTIVE

The students will try to Learn:

1) Introduce the concepts of fluid mechanics useful in Civil Engineering applications.
2) Provide a first level exposure to the students to fluid statics, kinematics and dynamics.
3) Learn about the application of mass, energy and momentum conservation laws for fluid flows.
4) Train and analyses engineering problems involving fluids with a mechanistic perspective is essential for the civil engineering students
5) To obtain the velocity and pressure variations in various types of simple flows.
6) To prepare a student to build a good fundamental background useful in the application-intensive courses covering hydraulics, hydraulic machinery and hydrology.

3. COURSE OUTCOMES

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

CO 1	Calculate the fluid pressure at a point by understanding the characteristics of fluids and its flow.	Apply
CO 2	**Understand** the broad principles of fluid statics, kinematics and dynamics	Apply
CO 3	**Calculate** the fluid flow in pipes notches and wiers	Apply
CO 4	**Calculate** flow parameters in Pipe Networks	Apply
CO 5	**Calculate** the parameters of boundry layer over flat plate	Understand

4. COURSE CONTENT

UNIT – I:

Properties of Fluid

Distinction between a fluid and a solid; Properties of fluids – Viscosity, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility.

Fluid Statics

Fluid Pressure: Pressure at a point, Pascals law, Hydrostatic law, Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micromanometers. Pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces.

UNIT – II:
Fluid Kinematics

Classification of fluid flow: steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; One, two- and three-dimensional flows; Streamline, path line, streak line and stream tube; stream function, velocity potential function, flow net, One, two- and three-dimensional continuity equations in Cartesian coordinates applications.

Fluid Dynamics

Surface and Body forces -Euler's and Bernoulli's equation; Momentum equation. correction factors. Bernoulli's equation to real fluid flows.

UNIT - III:
Flow Measurement in Pipes

Practical applications of Bernoulli's equation: venturi meter, orifice meter and pitot tube, applications of Momentum equations; Forces exerted by fluid flow on pipe bend, sudden enlargement in pipes.

Flow Over Notches & Weirs

Flow through rectangular; triangular and trapezoidal notches and weirs; End contractions; Velocity of approach. Broad crested weir.

UNIT - IV:
Flow through Pipes

Reynolds experiment, Reynolds number, Loss of head through pipes, Darcy-Wiesbatch equation, minor losses, total energy line, hydraulic grade line, Pipes in series, equivalent pipes, pipes in parallel, siphon, branching of pipes, three reservoir problem, power transmission through pipes. Analysis of pipe networks: Hardy Cross method and EPA NET, water hammer in pipes and control measures.

UNIT - V:
Laminar & Turbulent Flow

Laminar flow through circular pipes, and fixed parallel plates.

Boundary Layer Concepts

Prandtl contribution, Assumption and concept of boundary layer theory. Boundary-layer thickness, displacement, momentum & energy thickness concepts of laminar and turbulent boundary layers on a flat plate; Laminar sub-layer, smooth and rough boundaries. Local and average friction coefficients. Separation and Control. Drag and Lift and types of drag, magnus effect

5. **TEXT BOOKS**
   1) Fluid Mechanics by Modi and Seth, Standard Book House.
   2) Fluid Mechanics and Hydraulic machines by Manish Kumar Goyal, PHI learning Private Limited, 2015.
   3) Fluid Mechanics by R.C. Hibbeler, Pearson India Education Services Pvt. Ltd.

6. REFERENCE BOOKS

1) Fluid Mechanics – Frank M. White – 8th Edition – Mc Graw Hill Education.
2) *Theory and Applications of Fluid Mechanics, K.Subramanya, Tata McGraw Hill
3) Introduction to Fluid Mechanics and Fluid Machines by SK Som, Gautam Biswas, Suman Chakraborthy, Mc Graw Hill Education (India) Private Limited
4) Fluid Mechanics and Machinery,C.S.P. Ojha, R. Berndtsson and P. N. Chadramouli, Oxford University Press, 2010
5) Fluid mechanics & Hydraulic Machines, Domkundwar & Domkundwar Dhanpat Rai &Co
6) Fluid Mechanics and Hydraulic Machines, R. K. Bansal, Laxmi Publication 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		2	2								2	2	2
CO 2	2	2	2	2								2	2	2
CO 3	2	2	2	2					2			2	2	2
CO 4	2	2	2	2					2			2	2	2
CO 5	2		2	2					2			2	2	2

SURVEYING LABORATORY – II								
II Year - I Semester: CE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CE306PC	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	**1**	**2**	**2**	**40**	**60**	**100**
Contact Classes: Nil	Tutorial Classes: 16	Practical Classes: 32				**Total Classes: 48**		
Prerequisite: Surveying								

1. COURSE OVERVIEW

Surveying is the technique, profession, science and art of making all essential measurements to determine the relative position of points using elements of mathematics (geometry and trigonometry), physics, engineering and law. Also, students are introduced advanced surveying techniques like electronic distance measurement (EDM), total stations, remotes sensing, GPS surveying.

2. COURSE OBJECTIVE

The students will try to Learn:

1) Student will be able to learn and understand the various basic concept and principles used in surveying like Chain Surveying, Compass Surveying, Plane Table Surveying, and Levelling Surveying.
2) Student will be able to learn and understand about theodolite and total station in surveying.
3) Student will learn and understand how to calculate Area of plot and Ground.
4) Student will learn and understand about Horizontal Angle, Vertical Angle, Horizontal distance and Vertical distance to study the ground profile using total station.

3. COURSE OUTCOMES

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

CO 1	**Prepare** Map and Plan for required site with suitable scale.	Apply
CO 2	**Prepare** contour Map and Estimate the Quantity of earthwork required for formation level for Road and Railway Alignment.	Apply
CO 3	**Judge** which type of instrument to be used for carrying out survey for a Particular Area and estimate the area.	Apply
CO 4	**Judge** the profile of ground by observing the available existing contour map.	Apply
CO 5	Understand the use of GPS Device for calculation of areas and volumes	Understand

4. COURSE CONTENT

CYCLE - I

Theodolite surveying:
1) Measurement of horizontal angles and vertical angles.
2) Distance between two inaccessible points.
3) Measurement of area by theodolite traversing (Gales traverse table).
4) Determination of tachometer constants.
5) Distance between two inaccessible points using the principles of tachometer surveying.
6) Distance between two inaccessible points using the principles of trigonometric surveying

CYCLE - II

Total Station:
1) Area Measurement
2) Stake Out
3) Remote Elevation Measurement
4) Missing Line Measurement
5) Longitudinal & Cross Section Profile
6) Contouring
7) Providing a Simple Circular Curve
8) Demonstration using DGPS

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		2	2								2	2	2
CO 2	2	2	2	2								2	2	2
CO 3	2	2	2	2					2			2	2	2
CO 4	2	2	2	2					2			2	2	2
CO 5	2		2	2					2			2	2	2

STRENGTH OF MATERIALS LABORATORY								
II Year - I Semester: CE								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
CE307PC	**Core**	**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:								

1. COURSE OVERVIEW

The Strength of Materials Laboratory course offers hands-on experience in testing the mechanical properties of various construction materials. Students conduct experiments to determine properties such as tensile strength, compressive strength, hardness, and impact resistance. The lab reinforces theoretical concepts through practical testing of materials like steel, concrete, and wood. Emphasis is placed on accurate data recording, analysis, and interpretation of results. This course enhances students' understanding of material behavior under different loading conditions in civil engineering applications.

2. COURSE OBJECTIVE

The objectives of the course is to

1) To conduct the Tension test, Compression test on various materials
2) To conduct the Shear test, Bending test on determinate beams
3) To conduct the Compression test on spring and Hardness test using various machines
4) To conduct the Torsion test, Impact test on various materials

3. COURSE OUTCOMES

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

CO 1	**Determine** the yield stress, ultimate tensile stress, percentage elongation of steel, compressive strength of brick and concrete	Apply
CO 2	**Determine** the ultimate shear stress, modulus of elasticity of steel	Apply
CO 3	**Determine** the stiffness of the close coiled helical spring and hardness number of mild steel,brass, copper and aluminium.	Apply
CO 4	**Determine** the modulus of rigidity and impact strength of steel	Apply
CO 5	**Interpret** the strains and Deflection in beams	Apply

4. COURSE CONTENT

CYCLE – I

List of Experiments:
1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test

7. Compression test on concrete.
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges.
12. Continuous beam – deflection test.

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	1		2	2			1	2	1		2	2	2
CO 2	2	1		3	2			1	2	1		2	2	2
CO 3	2	1		2	1			1	2	1		2	2	2
CO 4	2	1		2	2			1	2	1		2	2	2
CO 5	2	1		2	1			1	2	1		2	2	2

COMPUTER AIDED DRAFTING LABORATORY							
II Year - I Semester: CE							
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
CE308PC	**Core**	-	-	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32				**Total Classes: 32**		
Prerequisite:								

1. COURSE OVERVIEW

The Computer Aided Drafting (CAD) Laboratory course introduces students to the fundamentals of engineering drawing using CAD software. It focuses on creating 2D and basic 3D drawings of civil engineering structures like buildings, slabs, beams, and columns. Students learn to use drafting tools, layers, dimensioning, and annotation techniques effectively. The course enhances precision and efficiency in preparing professional engineering drawings. It builds essential skills for design and documentation in modern civil engineering practice.

2. COURSE OBJECTIVE

The objectives of the course is to

1) To be able to plan buildings as per NBC**.**
2) To understand various types of conventional signs and brick bonds.
3) To draw the plan section and elevation for doors, trusses and staircases.
4) To use AutoCAD tools to draw building plans, sections and elevations from a given line diagram and specifications.
5) To develop working drawings of residential buildings.

3. COURSE OUTCOMES

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

CO 1	**Use** different Commands of selected drafting software to draw Conventional signs and brickbonds, Plan, Section and Elevation of buildings. **Plan** buildings as per NBC.	Apply
CO 2	**Draw** section and elevation of panelled doors and trusses.	Apply
CO 3	**Draw** and detail the different components of Stair cases.	Apply
CO 4	**Develop** and draw single /two storey residential building and public building as per the buildingby-laws.	Apply
CO 5	**Draw** Electrical layout, Plumbing layout for residential buildings.	Understand

4. COURSE CONTENT

CYCLE – I

List of Experiments:
1. Planning Aspects of Building systems as per National Building Code (NBC).
2. Brick bonds: English bond & Flemish bond – Odd and Even courses.
3. Developing plan and section of dog-legged staircase.
4. Developing plan of single storied residential building.

5. Developing section and elevation of single storied residential building.
6. Developing plan of single /two storied Residential building as per Building by-laws.
7. Developing plan of public building as per building by-laws.
8. Developing section and elevation of public building.
9. Development of working drawing of building –Electrical Layout.
10. Development of working drawing of building – Plumbing Layout.

5. TEXT BOOKS

1) Computer Aided Design Laboratory by M. N. Sesha Praksh & Dr. G. S. Servesh –Laxmi Publications.
2) Engineering Graphics by P. J. Sha – S. Chand & Co.
3) Civil Engineering Drawing-I by N. Sreenivasulu, S. Rama Rao – Radiant Publishing House.
4) Civil Engineering Drawing-II by N. Sreenivasulu – Radiant Publishing House.

6. REFERENCE BOOKS

1) Engineering Graphics by P. J. Sha - S. Chand & Co
2) Civil Engineering Drawing-I by S. Mahaboob Basha – Falcon Publishers
3) Building drawing by M. G. Shah - Tata McGraw-Hill Education
4) Structural Engineering Drawing by S. Mahaboob Basha – Falcon Publishers

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		2		2				2		1	2	2	2
CO 2	2	2	2	2	2				3		2	2	2	2
CO 3	3		2		2				2		1	2	2	2
CO 4	3	2	1	1	2				2		2	2	2	2
CO 5	3	1	1	1	2				2		1	2	2	2

GENDER SENSITIZATION LAB							

II Year - I Semester: CE

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
*MC309	Mandatory	-	-	2	0	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32				Total Classes: 32		
Prerequisite: Nil								

1. **COURSE OVERVIEW**

   This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality. This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender-based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

2. **COURSE OBJECTIVE**

   The students will try to Learn:

   1) To develop students' sensibility with regard to issues of gender in contemporary India.
   2) To provide a critical perspective on the socialization of men and women.
   3) To introduce students to information about some key biological aspects of genders.
   4) To expose the students to debates on the politics and economics of work.
   5) To help students reflect critically on gender violence.
   6) To expose students to more egalitarian interactions between men and women.

3. **COURSE OUTCOMES**

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

CO 1	Students will have developed a better understanding of important issues related to gender in contemporary India.
CO 2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film
CO 3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
CO 4	Students will acquire insight into the gendered division of labor and its relation to politics and economics.
CO 5	Men and women students and professionals will be better equipped to work and live together as equals.

4. **COURSE CONTENT**

Unit-I: UNDERSTANDING GENDER

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men- Preparing for Womanhood. Growing up Male. First lessons in Caste.

Unit – II: GENDER ROLES AND RELATIONS

Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences- Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary.

Unit – III: GENDER AND LABOUR

Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work." "Share the Load."-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work.

-Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

Unit – IV: GENDER - BASED VIOLENCE

The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No!-Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "Chupulu".

Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-"I Fought for my Life…."

Unit – V: GENDER AND CULTURE

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature-Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks- The Brave Heart.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

➢ Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments. Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on "Gender".

➢ ESSENTIAL READING: The Textbook, "Towards a World of Equals: A Bilingual Textbook on Gender" written by A.Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu published by Telugu Academy, Telangana Government in 2015.

ASSESSMENT AND GRADING:

- Discussion & Classroom Participation: 20%.
- Project/Assignment: 30%
- End Term Exam: 50%

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					
CO 2								3	3					
CO 3								3	3					
CO 4								3	3					
CO 5								3	3					