

Vignana Bharathi Institute of Technology, Aushapur

**R22-B.Tech Civil Engineering**

**II YEAR I SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1.	22BS2111	Probability and Statistics	3	1	0	4
2.	22CE2112	Building Materials, Construction and Planning	3	0	0	3
3.	22CE2113	Engineering Geology	3	0	0	3
4.	22CE2114	Strength of Materials – I	3	0	0	3
5.	22CE2115	Fluid Mechanics	3	0	0	3
6.	22CE2151	Surveying Laboratory - II	0	0	4	2
7.	22CE2152	Strength of Materials Laboratory	0	0	2	1
8.	22CE2153	Computer Aided Drafting Laboratory	0	0	2	1
9.	22MC0003	Constitution of India	3	0	0	0
		<b>Total Credits</b>	<b>18</b>	<b>1</b>	<b>8</b>	<b>20</b>

**II YEAR II SEMESTER**

S. No.	Course Code	Course Title	L	T	P	Credits
1.	22EE2216	Basic Electrical and Electronics Engineering	3	0	0	3
2.	22CE2211	Concrete Technology	3	0	0	3
3.	22CE2212	Strength of Materials – II	3	0	0	3
4.	22CE2213	Hydraulics and Hydraulics Machinery	3	0	0	3
5.	22CE2214	Structural Analysis - I	3	0	0	3
6.	22CE2251	Fluid Mechanics and Hydraulics Machinery Laboratory	0	0	2	1
7.	22CE2252	Concrete Technology Laboratory	0	0	2	1
8.	22EE2254	Basic Electrical and Electronics Engineering Laboratory	0	0	2	1
9.	22CE2281	Real-time Research Project/ Field-Based Project	0	0	4	2
10.	22MC0004	Gender Sensitization Laboratory	0	0	2	0
		<b>Total Credits</b>	<b>15</b>	<b>0</b>	<b>12</b>	<b>20</b>

## 22BS2111: PROBABILITY AND STATISTICS

B.Tech. II Year I Sem.

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3 1 0 4

**Pre-requisites:** Mathematics courses of first year of study.

**Course Objectives:** Develop ability to

- Understand basic concepts of Probability and Random variable.
- Gain knowledge of various discrete probability distributions.
- Recognize various Continuous probability distributions.
- Examine statistical hypothesis for large and small samples.
- Identify an appropriate curve, estimate correlation coefficient and coefficient of regression of the given data.

**Course Outcomes:** At the end of the course, student would be able to

- Distinguish between random variables.
- Measure Statistical Parameters using Binomial and Poisson distributions.
- Apply continuous probability distributions to solve engineering problems.
- Apply the hypothesis procedure to test means and proportions using large and small sample tests.
- Identify a curve using Method of least squares, the relation between the two variables using coefficient of correlation and regression.

### UNIT-I

**Probability & Random Variables:** Sample Space, Events, Counting Sample Points, Probability of an Event, Additive Rules, Conditional Probability, Independence, and the Product Rule, Baye's Rule.

**Random Variables and Probability Distributions:** Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions.

### UNIT-II

**Expectation and discrete distributions:** 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:** 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:** 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

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

### TEXT BOOKS:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability and Statistics for Engineers and Scientists, 9th Edition, Pearson Publications.
2. S C Gupta and V.K.Kapoor, Fundamentals of Mathematical Statistics, Khanna Publications.
3. K Murugesan and P Gurusamy, Probability and statistics, Anuradha Publication.

4. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

**REFERENCES:**

5. Dr B S Grewal, Higher engineering Mathematics, Khanna Publishers.
6. S.Ross, a First Course in Probability, 6th Ed., Pearson Education India, 2002.
3. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons Ltd, 2004.
4. Sheldon M Ross, Probability and statistics for Engineers and scientists, Academic Press.

## 22CE2112: BUILDING MATERIALS, CONSTRUCTION AND PLANNING

B.Tech. II Year I Sem.

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3 0 0 3

**Course Objectives:** The objectives of the course is to

- List the construction material.
- Explain different construction techniques
- Understand the building bye-laws
- Highlight the smart building materials
- Enable the student to Plan a building in par with rules and regulations.

**Course Outcomes:** After the completion of the course student should be able to

- Understand the different construction material.
- Understand the different component parts of building and their construction practices and techniques
- Understand the functional requirements to be considered for design and construction of building
- Identify the factors to be considered in planning and construction of buildings
- Plan a building based on the factors and principles of planning

### 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, Aluminum, 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

**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.

**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.

## 22CE2113: ENGINEERING GEOLOGY

B.Tech. II Year I Sem.

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**Course Objectives:** The objective of this Course is

- weathering process and mass movement
- Distinguish geological formations
- geological structures and processes for rock mass quality
- subsurface information and groundwater potential sites through geophysical investigations
- Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels

**Course Outcomes:** At the end of the course, the student will be able to:

- Understand weathering process and mass movement
- Distinguish geological formations
- Identify geological structures and processes for rock mass quality
- Identify subsurface information and groundwater potential sites through geophysical investigations
- Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels

### 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 drawbacks. 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 economic 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, Macroscopic 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 In situ 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.

#### **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

#### **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

## 22CE2114: STRENGTH OF MATERIALS – I

B.Tech. II Year I Sem.

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3 0 0 3

**Pre-Requisites:** Engineering Mechanics

**Course Objectives:** The objective of this Course is

- Stresses and strains in members and strain energy due to various types of loading
- . Shear force and bending moment for different beams with various kinds of loading
- . Flexural and shear stresses in beams
- . Measure the deflection of beams theoretically using different methods
- . measure principle stress and identify different various theory of failures.

**Course Outcome:** On completion of the course, the student will be able to:

- Calculate simple stresses and strains developed in structural member due to external load
- Calculate and sketch the shear force and bending moment diagram for different types of beams for various loading conditions
- Calculate the flexural stresses and shear stresses at any point for different sections
- Analyze the slope and deflection of simple beams using various methods
- Determine the principle stress by using various methods

### 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 moduli, Elastic constants and the relationship between them – Bars of 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 a real 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 (Von Mises Theory).

#### **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

#### **REFERENCE BOOKS:**

1. Mechanics of material 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, 3<sup>rd</sup> Edition, Universities Press

## 22CE2115: FLUID MECHANICS

B.Tech. II Year I Sem.

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**Course Objectives:** The objectives of the course are to

- Identify different types of fluids and fluid flows
- Obtain values of fluid properties and relationship between them
- Explain the principles of continuity, momentum, and energy as applied to fluid motion
- Apply these principles in the form of mathematical equations
- Solve these equations as applied to practical fluid mechanics problems

**Course Outcomes:** Upon completion of this course, students should be able to:

- Define the fluid properties and analyze the hydrostatic forces on submerged surfaces
- Classify the different types of fluid flows and analyze the concept of flow nets
- Apply Euler's and Bernoulli's equations to solve flow problems in pipes, notches, and weirs
- Determine the major and minor losses in pipe flow and solve pipe network related problems
- Analyse the concepts of Boundary layer theory

### 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.

### **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.

### **REFERENCE BOOKS:**

1. Fluid Mechanics – Frank M. White – 8<sup>th</sup> 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 Chakraborty, 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.

## 22CE2151: SURVEYING LABORATORY – II

B.Tech. II Year I Sem.

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0 0 4 2

### Course Objectives:

- 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.
- Student will be able to learn and understand about theodolite and total station in surveying.
- Student will learn and understand how to calculate Area of plot and Ground.
- Student will learn and understand about Horizontal Angle, Vertical Angle, Horizontal distance and Vertical distance to study the ground profile using total station.
- Student will learn and understand using DGPS

**Course Outcomes:** At the end of the course student will be able to:

- Prepare Map and Plan for required site with suitable scale.
- Prepare contour Map and Estimate the Quantity of earthwork required for formation level for Road and Railway Alignment.
- Judge which type of instrument to be used for carrying out survey for a Particular Area and estimate the area.
- Judge the profile of ground by observing the available existing contour map.
- Measuring area by using DGPS

### 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:

7. Area Measurement
8. Stake Out
9. Remote Elevation Measurement
10. Missing Line Measurement
11. Longitudinal & Cross Section Profile
12. Contouring
13. Providing a Simple Circular Curve
14. Demonstration using DGPS

## 22CE2152: STRENGTH OF MATERIALS LABORATORY

B.Tech. II Year I Sem.

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### Course Objectives:

- To conduct the Tension test, Compression test on various materials
- To conduct the Shear test, Bending test on determinate beams
- To conduct the Compression test on spring and Hardness test using various machines
- To conduct the Torsion test, Impact test on various materials
- To conduct the deflection test, on various beams

**Course Outcomes:** After the completion of the course, students should be able to

- Determine the yield stress, ultimate tensile stress, percentage elongation of steel, compressive strength of brick and concrete
- Determine the ultimate shear stress, modulus of elasticity of steel
- Determine the stiffness of the close coiled helical spring and hardness number of mild steel, brass, copper and aluminium.
- Determine the modulus of rigidity and impact strength of steel.
- Determine deflection various beams.

### 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.

## 22CE2153: COMPUTER AIDED DRAFTING LABORATORY

B.Tech. II Year I Sem.

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0 0 2 1

### Course Objectives:

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

**Course Outcomes:** After completion of the course, the student should be able to

- Plan buildings as per NBC.
- Use different Commands of selected drafting software to draw Conventional signs and brick bonds, Plan, Section and Elevation of buildings.
- Draw section and elevation of panelled doors and trusses.
- Draw and detail the different components of Stair cases.
- Develop and draw single /two storey residential building and public building as per the building by-laws.

### 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.

### TEXT BOOKS:

1. Computer Aided Design Laboratory by M. N. Sesa 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.

### 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

## 22MC0003: CONSTITUTION OF INDIA

B.Tech. II Year I Sem.

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**Course Objectives:** Students will be able to:

- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
- To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

**Course Outcomes:** Students will be able to:

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
- Discuss the passage of the Hindu Code Bill of 1956.

**Unit - 1** History of Making of the Indian Constitution- History of Drafting Committee.

**Unit - 2** Philosophy of the Indian Constitution- Preamble Salient Features

**Unit - 3** Contours of Constitutional Rights & Duties - Fundamental Rights

- Right to Equality
- Right to Freedom
- Right against Exploitation
- Right to Freedom of Religion
- Cultural and Educational Rights
- Right to Constitutional Remedies
- Directive Principles of State Policy
- Fundamental Duties.

**Unit - 4** Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions

**Unit - 5** Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Panchayat raj: Introduction, PRI: Zila Panchayat. Elected officials and their roles, CEO Zila Panchayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

**Unit - 6** Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

**Suggested Reading:**

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

## 22EE2216: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

II B. Tech II Sem

L T P C

3 0 0 3

### Course Objectives:

- To understand the concepts of DC electrical circuits, AC single phase & three phase circuits
- To impart the knowledge of various electrical installations
- To study and understand the different types of DC/AC machines and Transformers
- To introduce the concepts of diodes, rectifiers and filters
- To impart the knowledge of various configurations, characteristics and applications of BJT and FET

**Course Outcomes:** At the end of this course students will demonstrate the ability to

- Solve electrical circuits using network laws.
- Discuss the components of Low Voltage Electrical Installations
- Discuss the construction and working principles of Electrical Machines
- Identify and characterize various diodes, rectifiers and filters
- Classify various types of Transistors

### UNIT-I:

**D.C.Circuits:** Electrical circuit elements (R,L and C),voltage and current sources, KVL&KCL, analysis of simple circuits with dc excitation.

**A.C.Circuits:** Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits , Three-phase balanced circuits, voltage and current relations in star and delta connections.

### UNIT-II:

**Electrical Installations:** Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries, battery backup. Elementary calculations for energy consumption,power factor improvement.

### UNIT-III:

**Electrical Machines:** Construction and Working principle of Single-phase transformer, EMF Equation, losses in Transformers, efficiency. Construction and working principle of DC generators, EMF equation. Working principle of DC motors, Torque equation. Construction and working principle of Three-phase Induction motor, Torques equation. Construction and working principle of Synchronous Generators.

### UNIT-IV:

**P-N Junction and Zener Diode:** Principle of Operation Diode equation, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Zener diode characteristics and applications.

**Rectifiers and Filters:** P-N junction as a rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier. Filters –Inductor Filters, Capacitor Filters.

### UNIT-V:

**Bipolar Junction Transistor (BJT):** Construction, Principle of Operation, Amplifying Action, Common Emitter, Common Base and Common Collector configurations, Comparison of CE, CB and CC configurations.



**Field Effect Transistor (FET):** Construction, Principle of Operation, Comparison of BJT and FET, Biasing FET.

**TEXTBOOKS:**

1. Basic Electrical and Electronics Engineering–M S Sukija T K Nagasarkar Oxford University
2. Basic Electrical and Electronics Engineering-DP Kothari. I J Nagarath, McGraw Hill Education

**REFERENCEBOOKS:**

1. Electronic Devices and Circuits – R. L. Boylestad and Louis Nashelsky, PEI/PHI, 9th Ed,2006.
2. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6<sup>th</sup> edition.
3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
4. 4.E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

## 22CE2211: CONCRETE TECHNOLOGY

B.Tech. II Year II Sem.

L T P C  
3 0 0 3

**Pre-Requisites:** Building Materials

**Course Objectives:** The objectives of the course are to

- State-of-the art knowledge on durable and sustainable concrete by blending various mineral and chemical admixtures into it.
- Empower them in the decision-making process regarding the various concrete projects, construction procedures and performance test methods.
- The process of material selection, proportioning, mixing, transporting, placing and curing concrete will be focused.
- Perform field and laboratory tests on concrete in plastic and hardened stage.
- Understand different types of cement as per their properties for different field applications.

**Course Outcomes:** After the completion of the course student should be able to

- Classify different types of cement, mineral and chemical admixtures.
- Classify different types of aggregates and their properties.
- Demonstrate various properties of fresh concrete and their test methods.
- Demonstrate various properties of hardened concrete and their test methods.
- Analyse characteristics of ingredients to design a suitable concrete mix for field applications according to IS codes

### UNIT I

**Aggregate:** Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine, Manufactured sand and coarse Aggregates – Gap graded aggregate – Maximum aggregate size- Properties Recycled aggregate.

### UNIT - II

**Fresh Concrete:** Workability – Factors affecting workability – Measurement of workability by different tests – Setting times of concrete – Effect of time and temperature on workability – Segregation & bleeding – Mixing, vibration and revibration of concrete – Steps in manufacture of concrete – Quality of mixing water.

### UNIT – III

**Hardened Concrete:** Water / Cement ratio – Abram's Law – Gel/space ratio – Gain of strength of concrete – Maturity concept – Strength in tension and compression – Factors affecting strength – Relation between compression and tensile strength - Curing.

**Testing of Hardened Concrete:** Compression tests– Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Pull-out test, Non-destructive testing methods – codal provisions for NDT.

### UNIT - IV

**Elasticity, Creep & Shrinkage** – Modulus of elasticity – Dynamic modulus of elasticity – Poisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage – types of shrinkage.

### UNIT – V

**Admixtures:** Types of admixtures – mineral and chemical admixtures.

**Mix Design:** Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design.

**Special Concretes:** Introduction to Light weight concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Polymer concrete – High performance concrete – Self compacting concrete, Nano silica and Nano Alumina concrete.

**TEXT BOOKS:**

1. Concrete Technology by M.S. Shetty. – S. Chand & Co.; 2004
2. Concrete Technology by A.R. Santhakumar, 2<sup>nd</sup> Edition, Oxford university Press, New Delhi
3. Concrete Technology by M. L. Gambhir. – Tata Mc. Graw Hill Publishers, 5<sup>TH</sup>Edition, New Delhi

**REFERENCE BOOKS:**

1. Properties of Concrete by A. M. Neville – Low priced Edition – 4th edition
2. Concrete: Micro structure, Properties and Materials – P.K. Mehta and J.M. Monteiro, Mc-Graw Hill Publishers

**IS Codes:**

IS 383 : 2016

IS 516 : 2018 (Part -1 - 4)

IS 10262 - 2019

## 22CE2212: STRENGTH OF MATERIALS – II

B.Tech. II Year II Sem.

L T P C  
3 0 0 3

**Pre-Requisites:** Strength of Materials - I

**Course Objectives:** The objective of this course is to study of

- Torsion of shafts and springs
- Columns, struts and Beam column subjected to different loading.
- Direct and bending stresses
- Thin and thick cylinders
- Unsymmetrical bending and Shear center

**Course Outcome:** On completion of the course, the student will be able to:

- Determine stresses in the member subjected to torsion and springs
- Analyze columns and struts subjected to different loading.
- Understand the concept of direct and bending stresses
- Analyze, thin and thick cylinders
- Determine stress in beams subjected to unsymmetrical bending and locate shear center of beam sections

### UNIT – I

**Torsion of Circular Shafts:** Theory of pure torsion – Derivation of Torsion equation -Assumptions made in the theory of pure torsion – Polar section modulus – Power transmitted by shafts – Combined bending and torsion – Design of shafts according to theories of failure.

**Springs:** Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel.

### UNIT – II

**Columns and Struts:** Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler's theorem for long columns- assumptions-derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler's critical stress – Limitations of Euler's theory– Long columns subjected to eccentric loading – Secant formula – Empirical formulae — Rankine – Gordon formula- Straight line formula – Prof. Perry's formula.

**BEAM COLUMNS:** Laterally loaded struts – subjected to uniformly distributed and concentrated loads.

### UNIT - III

**Direct and Bending Stresses:** Stresses under the combined action of direct loading and bending moment, core of a section – determination of stresses in the case of retaining walls, chimneys and dams – conditions for stability-Overturning and sliding – stresses due to direct loading and bending moment about both axis.

### UNIT – IV

**Thin Cylinders:** Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in diameter, and volume of thin cylinders – Thin spherical shells.

**Thick Cylinders:** Introduction - Lamé's theory for thick cylinders – Derivation of Lamé's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage.

## **UNIT – V**

### **Unsymmetrical Bending:**

Introduction – Centroidal principal axes of section – Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis.

**Shear Centre:** Introduction - Shear center for symmetrical and unsymmetrical (channel, I, T and L) sections.

### **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.

### **REFERENCE BOOKS:**

1. Mechanics of Materials by R.C. Hibbeler, Pearson Education
2. Engineering Mechanics of Solids by Popov E.P. Prentice-Hall Ltd
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. Fundamentals of Solid Mechanics by M. L. Gambhir, PHI Learning Pvt. Ltd

## 22CE2213: HYDRAULICS AND HYDRAULIC MACHINERY

B.Tech. II Year II Sem.

L T P C  
3 0 0 3

**Course Objectives:** The objective of the course is

- Understand the importance of types of flows, types of channels, specific energy, hydraulic jump etc
- Understand the concepts of dimensional analysis and plan Hydraulic similitudes
- Gain knowledge of impact of jet on vanes
- Understand the concept of working proportions of Hydraulic turbines
- Understand the concept of working proportions of pumps

**Course Outcomes:** At the end of the course the student will able to

- Apply their knowledge of Fluid Mechanics in addressing problems in open channels when the flow is uniform
- Analyse non-uniform flow and solve problems related to gradually and rapidly varied flows
- Apply Dimensional Analysis and to differentiate the model, prototype, and similitude conditions for practical problems
- Analyse the hydro dynamic forces of jets on stationary and moving plates and apply them to turbines
- Study the performance of centrifugal and reciprocating pumps

### UNIT - I

**Open Channel Flow – I:** Introduction to Open channel flow-Comparison between open channel flow and pipe flow, Classification of open channel flows, Velocity distribution. Uniform flow – Characteristics of uniform flow, Chezy's, Manning's and Bazin formulae for uniform flow – Factors affecting Manning's Roughness Coefficient. Most economical sections. Computation of Uniform flow, Normal depth.

**Critical Flow:** Specific energy – critical depth - computation of critical depth – critical, sub critical and super critical flows-Channel transitions.

### UNIT - II

**Open Channel Flow – II:** Non-uniform flow – Gradually Varied Flow - Dynamic equation for G.V.F; Classification of channel bottom slopes – Classification and characteristics of Surface profiles – Computation of water surface profiles by Numerical and Analytical approaches. Direct step method.

**Rapidly varied flow:** Elements and characteristics (Length and Height) of Hydraulic jump in rectangular channel– Types, applications and location of hydraulic jump, Energy dissipation and other uses – Positive and Negative Surges (Theory only).

### UNIT - III

**Dimensional Analysis and Hydraulic Similitude:** Dimensional homogeneity – Rayleigh's method and Buckingham's  $\pi$  methods – Dimensionless groups. Similitude, Model studies, Types of models. Application of dimensional analysis and model studies to fluid flow problems. Distorted models.

**Basics of Turbo Machinery:** Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, Jet striking centrally and at tip, Velocity triangles at inlet and outlet, expressions for work done and efficiency – Angular.

### UNIT - IV

**Hydraulic Turbines – I:** Elements of a typical Hydropower installation – Heads and efficiencies – Classification of turbines – Pelton wheel – Francis turbine – Kaplan turbine – working, working proportions, velocity diagram, work done and efficiency, hydraulic design. Draft tube – Classification, functions and efficiency.

**Hydraulic Turbines – II:** Governing of turbines – Surge tanks – Unit and specific turbines – Unit speed – Unit quantity – Unit power – Specific speed – Performance characteristics – Geometric similarity – Cavitation. Selection of turbines.

## **UNIT - V**

**Centrifugal Pumps:** Pump installation details – classification – work done – Manometric head – minimum starting speed – losses and efficiencies – specific speed. Multistage pumps – pumps in parallel – performance of pumps – characteristic curves – NPSH – Cavitation.  
Reciprocating pumps – Working, discharge, slip indicator diagrams.

### **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. Open channel flow by V.T. Chow (McGraw Hill Book Company).

### **REFERENCE BOOKS:**

1. Fluid Mechanics by R. C. Hibbeler, Pearson India Education Services Pvt. Ltd
2. Fluid Mechanic & Fluid Power Engineering by D. S. Kumar (Kataria & Sons Publications Pvt. Ltd.).
3. Introduction to Fluid Mechanics and Fluid Machines by SK Som, Gautam Biswas, Suman Chakraborty, Mc Graw Hill Education (India) Private Limited
4. Hydraulic Machines by Banga & Sharma (Khanna Publishers).

## 22CE2214: STRUCTURAL ANALYSIS – I

B.Tech. II Year II Sem.

L T P C  
3 0 0 3

**Pre-Requisites:** Strength of Materials – I

**Course Objectives:** The objective of the course is to

- Differentiate the statically determinate and indeterminate structures.
- To understand the nature of stresses developed in perfect frames and three hinged arches for various types of simple loads
- Analyse the statically indeterminate members such as fixed bars, continuous beams and for various types of loading.
- Understand the energy methods used to derive the equations to solve engineering problems
- Evaluate the Influence on a beam for different static & moving loading positions

**Course Outcomes:** At the end of the course the student will able to

- An ability to apply knowledge of mathematics, science, and engineering
- Analyse the statically indeterminate bars and continuous beams
- Draw strength behaviour of members for static and dynamic loading.
- Calculate the stiffness parameters in beams and pin jointed trusses.
- Understand the indeterminacy aspects to consider for a total structural system.

### UNIT – I

**Analysis of Perfect Frames:** Types of frames- Perfect, Imperfect and Redundant pin jointed plane frames - Analysis of determinate pin jointed plane frames using method of joints, method of sections and tension coefficient method for vertical loads, horizontal loads and inclined loads.

### UNIT – II

**Energy Theorems:** Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's theorem-Unit Load Method - Deflections of simple beams and pin- jointed plane frames - Deflections of statically determinate bent frames.

**Three Hinged Arches –** Introduction – Types of Arches – Comparison between Three hinged and Two hinged Arches - Linear Arch - Eddy's theorem - Analysis of Three hinged arches - Normal Thrust and radial shear and bending moment - Geometrical properties of parabolic and circular arches - Three hinged parabolic circular archeshaving supports at different levels.

### UNIT - III

**Propped Cantilever and Fixed Beams:** Determination of static and kinematic indeterminacies for beams- Analysis of Propped cantilever and fixed beams, including the beams with different moments of inertia - subjected to uniformly distributed load - point loads - uniformly varying load, couple and combination of loads - Shear force, Bending moment diagrams and elastic curve for Propped Cantilever and Fixed Beams-Deflection of Propped cantilever and fixed beams - effect of sinking of support, effect of rotation of a support.

### UNIT – IV

**Continuous Beams:** Introduction-Continuous beams - Clapeyron's theorem of three moments-Analysis of continuous beams with constant and variable moments of inertia with one or both ends fixed-continuous beams with overhang - effect of sinking of supports.

**Slope Deflection Method:** Derivation of slope-deflection equation, application to continuous beams with and without sinking of supports -Determination of static and kinematic indeterminacies for frames - Analysis of Single Bay, Single storey Portal Frames by Slope Deflection Method including Side Sway - Shear force and bending moment diagrams and Elastic curve.



## **UNIT – V**

**Moving Loads and Influence Lines:** Introduction maximum SF and BM at a given section and absolute maximum shear force and bending moment due to single concentrated load ,uniformly distributed load longer than the span, uniformly distributed load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length - Definition of influence line for shear force and bending moment - load position for maximum shear force and maximum bending Moment at a section - Point loads, uniformly distributed load longer than the span, uniformly distributed load shorter than the span.

### **TEXT BOOKS:**

1. Structural Analysis Vol –I & II by V.N. Vazirani and M.M. Ratwani, Khanna Publishers.
2. Structural Analysis Vol I & II by G. S. Pandit and S.P. Gupta, Tata McGraw Hill Education Pvt. Ltd.
3. Structural analysis T. S Thandavamoorthy, Oxford university Press

### **REFERENCE BOOKS:**

1. Structural Analysis by R. C. Hibbeler, Pearson Education
2. Basic Structural Analysis by K.U. Muthu *et al.*, I.K. International Publishing House Pvt. Ltd
3. Mechanics of Structures Vol – I and II by H.J. Shah and S.B. Junnarkar, Charotar Publishing House Pvt. Ltd.
4. Basic Structural Analysis by C. S. Reddy, Tata McGraw Hill Education Pvt. Ltd.
5. Fundamentals of Structural Analysis by M.L. Gamhir, PHI Learning Pvt. Ltd.

## 22CE2251: HYDRAULICS AND HYDRAULIC MACHINERY LABORATORY

B.Tech. II Year II Sem.

L T P C  
0 0 2 1

### Course Objectives

- To identify the behavior of analytical models introduced in lecture to the actual behavior of real fluid flows.
- To explain the standard measurement techniques of fluid mechanics and their applications.
- To illustrate the students with the components and working principles of the Hydraulic machines- different types of Turbines and other miscellaneous hydraulics machines
- To illustrate the students with the components and working principles of the Hydraulic machines- different types of Pumps, and other miscellaneous hydraulics machines.
- To analyze the laboratory measurements and to document the results in an appropriate format.

**Course Outcomes:** Students who successfully complete this course will have demonstrated ability to:

- Describe the basic measurement techniques of fluid mechanics and its appropriate application.
- Interpret the results obtained in the laboratory for various experiments.
- Discover the practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.
- Write a technical laboratory report

### List of Experiments

1. Verification of Bernoulli's equation
2. Determination of Coefficient of discharge for a small orifice by a constant head method
3. Calibration of Venturimeter / Orifice Meter
4. Calibration of Triangular / Rectangular/Trapezoidal Notch
5. Determination of Minor losses in pipe flow
6. Determination of Friction factor of a pipe line
7. Determination of Energy loss in Hydraulic jump
8. Determination of Manning's and Chezy's constants for Open channel flow.
9. Impact of jet on vanes
10. Performance Characteristics of Pelton wheel turbine
11. Performance Characteristics of Francis turbine
12. Performance characteristics of Kaplan Turbine
13. Performance Characteristics of a single stage / multi stage Centrifugal Pump

## 22CE2252: CONCRETE TECHNOLOGY LABORATORY

**B.Tech. II Year II Sem.**

**L T P C**  
**0 0 2 1**

### **Course Objectives:**

- To Learn laboratory tests and their procedures for cement.
- To Learn laboratory tests and their procedures for fine and coarse aggregates.
- To Evaluate Fresh concrete properties.
- To Evaluate Hardened concrete properties.
- To understand the procedure of designing the concrete mix of given specification of its ingredients along with appropriate water cement ratio and admixtures.

**Course Outcomes:** After completion of the course, the student should be able to

- Categorize the tests on materials used in construction.
- Classify different types of aggregates and their properties.
- To perform the tests on concrete for its characterization.
- To Design Economic Concrete Mix Proportioning by Using Indian Standard Method.
- To prepare a laboratory report.

### **LIST OF EXERCISES:**

#### **1. Tests on Cement:**

- a) Soundness.
- f) Compressive strength.

#### **2. Tests on Aggregates:**

- a) Specific gravity of fine aggregate.
- b) Specific gravity of coarse aggregate.
- c) Bulking of fine aggregate.
- d) Grading of fine aggregate

**3.** IS method of mix design of normal concrete as per IS : 10262

#### **4. Tests on Fresh Concrete:**

- a) Slump cone test.
- b) Compacting factor test.
- c) Vee-Bee consistometer test.

#### **5. Tests on Hardened Concrete:**

- a) Compressive & Tensile strength tests.
- b) Modulus of elasticity of concrete.
- c) Non-destructive testing of concrete.

## 22EE2254: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY

II B. Tech II Sem

L T P C  
0 0 2 1

**Pre-requisites:** Basic Electrical and Electronics Engineering

### Course Objectives:

- To acquire knowledge the concepts of electrical circuits and its components
- To understand magnetic circuits, DC circuits and AC single phase & three phase circuits
- To study and understand the different types of DC/AC machines and Transformers.
- To acquire knowledge on various types of diodes and transistors

**Course Outcomes:** At the end of this course, students will demonstrate the ability to

- Solve electrical circuits using network laws and theorems.
- Determine the characteristics of basic Electric and Magnetic circuits
- Determine the characteristics of DC/AC machines and Transformers
- Determine the characteristics of various types of diodes and transistors

### List of experiments/demonstrations:

**PARTA: ELECTRICAL** (Any **FIVE** experiments need to be conducted)

1. Verification of KVL and KCL
2. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer
3. Measurement of Active and Reactive Power in a balanced Three-phase circuit
4. Performance Characteristics of a DC Shunt Motor
5. Performance Characteristics of a Three-phase Induction Motor
6. No-Load Characteristics of a Three-phase Alternator

**PARTB: ELECTRONICS** (Any **FIVE** experiments need to be conducted)

1. Study and operation of  
(i) Multi-meters (ii) Function Generator (iii) Regulated Power Supplies (iv) CRO.
2. PN Junction diode characteristics
3. Zener diode characteristics and Zener as voltage Regulator
4. Input & Output characteristics of Transistor in CB/CE configuration
5. Full Wave Rectifier with &without filters
6. Input and Output characteristics of FET in CS configuration

### TEXTBOOKS:

1. Basic Electrical and Electronics Engineering–M S Sukija T K Nagasarkar Oxford University
2. Basic Electrical and Electronics Engineering-DP Kothari. I J Nagarath, McGraw Hill Education

### REFERENCEBOOKS:

1. Electronic Devices and Circuits–R.L.Boylestead and Louis Nashelsky, PEI/PHI,9<sup>th</sup> Ed,2006.
2. Millman’s Electronic Devices and Circuits – J. Millman and C.C. Halkias, Satyabrata Jit, TMH,2/e,1998.
3. Engineering circuitanalysis by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6<sup>th</sup>edition.
4. Linear circuit analysis (time domain phasor and Laplace transform approaches)-2<sup>nd</sup>edition by Raymond A.De Carloand Pen-Min-Lin, Oxford UniversityPress-2004.
5. Network Theory by N.C.Jagan &C. Lakshmi narayana, B.S.Publications.
6. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.
7. L.S.Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press,2011.
8. E.Hughes,“ Electrical and Electronics Technology”,Pearson,2010.
9. V. D.Toro, “Electrical Engineering Fundamentals”, Prentice HallIndia,1989.

**22CE2281: REAL TIME RESEARCH PROJECT**

**B.Tech. II Year II Sem.**

**L T P C**  
**0 0 4 2**

## 22MC0004: GENDER SENSITIZATION LABORATORY

B.Tech. II Year II Sem.

L T P C  
0 0 2 0

### COURSE DESCRIPTION

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.

### Objectives of the Course:

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

### Learning Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- 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.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labor and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

### 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 Out Is 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, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu published by Telugu Akademi, Telangana Government in 2015.

#### **ASSESSMENT AND GRADING:**

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