

# **COURSE STRUCTURE & DETAILED SYLLABUS**

**ACE - R22**

## **DEPARTMENT OF CIVIL ENGINEERING**

**II B.Tech II Sem (2022 Batch)**

### **Course Structure & Syllabus**



**ACE**

**Engineering College**

**Ankushapur(V), Ghatkesar(M), Medchal Dist - 501 301**

***(An Autonomous Institution, Affiliated to JNTUH, Hyderabad)***

**Department of CIVIL ENGINEERING**

B.Tech. in CIVIL ENGINEERING

COURSE STRUCTURE & SYLLABUS (ACE-R22 Regulations)

Applicable from AY 2022-23 Batch



# ACE Engineering College

Ankushapur(V), Ghatkesar(M), Medchal Dist - 501 301

*(An Autonomous Institution)*

**B.TECH. FOUR YEAR DEGREE COURSE**

**CIVIL ENGINEERING**

**COURSE STRUCTURE & SYLLABUS**

## II Year II Semester

S.No.	Course Code	Course Title	Periods per week			Credits
			L	T	P	
1	EE401ES	Elements of Electrical and Electronics Engineering	3	0	0	3
2	CE402PC	Concrete Technology	3	0	0	3
3	CE403PC	Strength of Materials – II	3	0	0	3
4	CE404PC	Hydraulics and Hydraulics Machinery	3	0	0	3
5	CE405PC	Structural Analysis - I	3	0	0	3
6	CE406PC	Hydraulics and Hydraulics Machinery Laboratory	0	0	2	1
7	EE407ES	Elements of Electrical and Electronics Engineering Laboratory	0	0	2	1
8	CE408PC	Engineering Geology & Concrete Technology Laboratory	0	0	2	1
9	CE409PC	Research Project/ Field-Based Project	0	0	4	2
10	MC410	Gender Sensitization Laboratory	0	0	2	0
		<b>Total Credits</b>	<b>15</b>	<b>0</b>	<b>12</b>	<b>20</b>

## **EE401ES: ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING**

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

**L T P C**

**3 0 0 3**

### **Course Objectives:**

- To introduce 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 impart the knowledge of various electrical installations.
- To introduce the concept of power, power factor and its improvement.
- To introduce the concepts of diodes & transistors, and
- To impart the knowledge of various configurations, characteristics and applications.

### **Course Outcomes:**

CO1: To analyze and solve electrical circuits using network laws and theorems.

CO2: To understand and analyze basic Electric and Magnetic circuits

CO3: To study the working principles of Electrical Machines

CO4: To introduce components of Low Voltage Electrical Installations

CO5: To identify and characterize diodes and 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. Elementary calculations for energy consumption, power factor improvement and battery backup.

### **UNIT - III:**

**Electrical Machines:** Working principle of Single-phase transformer, equivalent circuit, losses in transformers, efficiency, Three-phase transformer connections. Construction and working principle of DC generators, EMF equation, working principle of DC motors, Torque equations and Speed control of DC motors, Construction and working principle of Three-phase Induction motor, Torques equations and Speed control of Three-phase induction motor. 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, Ripple Factor - Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L- section Filters,  $\pi$ - section 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.

**TEXT BOOKS:**

1. Basic Electrical and electronics Engineering –M S Sukija TK Nagasarkar Oxford University
2. Basic Electrical and electronics Engineering-D P Kothari. I J Nagarath, McGraw Hill Education

**REFERENCE BOOKS:**

1. Electronic Devices and Circuits – R. L. Boylestad 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 circuit analysis- 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 Carlo and Pen-Min-Lin, Oxford University Press-2004.
5. Network Theory by N. C. Jagan& C. Lakshminarayana, 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 Hall India, 1989.

## CE402PC: 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

- **Know** the aggregate properties for different field applications.
- **Various** materials that are used in the concrete making.
- **Knowledge** about the processes involved in the making of concrete.
- **Know** field and laboratory **tests** on concrete in plastic and hardened stage.
- **Understand & Design** economic concrete mix proportion for different exposure conditions and intended purposes.

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

CO1: **Determine** the properties of concrete ingredients i.e. sand, coarse aggregate by different tests.

CO2: **Determine** the properties of fresh concrete

CO3: **Determine** the properties of hardened concrete

CO4: Recognize the effects of the rheology and early age properties of concrete on its long-term behavior.

CO5: **Apply** the use of various admixtures to design cement-based materials, determine the mix proportions for various grades of concrete using BIS method & study the behavior of special concretes.

### 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

## CE403PC: 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 understand the nature of stresses developed in simple geometries shafts, springs, columns & cylindrical and spherical shells for various types of simple loads.
- To calculate the stability and elastic deformation occurring in various simple geometries for different types of loading.
- To understand the unsymmetrical bending and shear center importance for equilibrium conditions in a structural member of having different axis of symmetry.
- To understand the different stress developed in thin & thick cylinder.
- To calculate the shear centre for different sections.

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

CO1: Describe the concepts and principles, understand the theory of elasticity, and perform calculations, relative to the strength of structures and mechanical components in particular to torsion and direct compression.

CO2: To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading.

CO3: Analyze strength and stability of structural members subjected to Direct, and Direct and bending stresses.

CO4: Understand and evaluate the shear center for different structural elements.

CO5: Compute the principal stresses under unsymmetrical bending for the resolution bending moment and the deflection of beams.

### 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.

## CE404PC: 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

- To Define the fundamental principles of water conveyance in open channels.
- To Discuss and analyze the open channels in uniform and Non-uniform flow conditions.
- To Study the characteristics of hydroelectric power plant and its components.
- To analyze and design of hydraulic machinery and its modeling.
- To Prepare a student to build a good fundamental background useful in the application – intensive courses covering hydraulics, hydraulic machinery & hydrology.

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

- CO1: Apply their knowledge of fluid mechanics in addressing problems in open channels and hydraulic machinery.
- CO2: Understand and solve problems in uniform, gradually and rapidly varied flows in open channel in steady state conditions.
- CO3: Apply dimensional analysis and to differentiate the model, prototype and similitude conditions for practical problems.
- CO4: Get the knowledge on different hydraulic machinery devices and its principles that will be utilized in hydropower development and for other practical usages.
- CO5: Interpret the performance characteristics of centrifugal 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 workdone 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, SumanChakraborty, Mc Graw Hill Education (India) Private Limited
4. Hydraulic Machines by Banga & Sharma (Khanna Publishers).

## CE405PC: 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

1. Differentiate the statically determinate and indeterminate structures.
2. To understand the nature of stresses developed in perfect frames and three hinged arches for various types of simple loads
3. Analyse the statically indeterminate members such as fixed bars, continuous beams and for various types of loading.
4. Understand the energy methods used to derive the equations to solve engineering problems
5. 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

CO1: An ability to apply knowledge of mathematics, science, and engineering to analyse the statically indeterminate bars and continuous beam.

CO2: Draw strength behaviour of members for static and dynamic loading.

CO3: Calculate the stiffness parameters in beams and pin jointed trusses.

CO4: Understand the indeterminacy aspects to consider for a total structural system.

CO5: Identify, formulate, and solve engineering problems with real time loading

### 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 arches having 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 PublishingHouse 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.

## **CE406PC: 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 realfluid 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 Hydraulicmachines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- To **analyze** the laboratory measurements and to document the results in an appropriate format.
- To **analyze** the behavior of fluid flow & energy characteristics.

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

CO1: **Describe** the basic measurement techniques of fluid mechanics and its appropriate application.

CO2: **Interpret** the results obtained in the laboratory for various experiments.

CO3: **Discover** the practical working of Hydraulic machines- different types of Turbines, Pumps, andother miscellaneous hydraulics machines.

CO4: **Compare** the results of analytical models introduced in lecture to the actual behavior of realfluid flows and draw correct and sustainable conclusions.

CO5: 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 Keplan Turbine
13. Performance Characteristics of a single stage / multi stage Centrifugal Pump.

## **EE407ES: ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY**

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

**L T P C**

**0 0 2 1**

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

### **Course Objectives:**

- To introduce 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 impart the knowledge of various electrical installations.
- To introduce the concept of power, power factor and its improvement.
- To introduce the concepts of diodes & transistors, and
- To impart the knowledge of various configurations, characteristics and applications.

### **Course Outcomes:**

CO1: To analyze and solve electrical circuits using network laws and theorems.

CO2: To understand and analyze basic Electric and Magnetic circuits

CO3: To study the working principles of Electrical Machines

CO4: To introduce components of Low Voltage Electrical Installations

CO5: To identify and characterize diodes and various types of transistors.

### **List of experiments/demonstrations:**

#### **PART A: ELECTRICAL**

1. Verification of KVL and KCL
2. (i) Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer  
(ii) Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star) in a Three Phase Transformer
3. Measurement of Active and Reactive Power in a balanced Three-phase circuit
4. Performance Characteristics of a Separately Excited DC Shunt Motor
5. Performance Characteristics of a Three-phase Induction Motor
6. No-Load Characteristics of a Three-phase Alternator

#### **PART B: ELECTRONICS**

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.

**TEXT BOOKS:**

1. Basic Electrical and electronics Engineering –M S Sukija TK Nagasarkar Oxford University
2. Basic Electrical and electronics Engineering-D P Kothari. I J Nagarath, McGraw Hill Education

**REFERENCE BOOKS:**

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 circuit analysis- 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 Carlo and Pen-Min-Lin, Oxford University Press-2004.
5. Network Theory by N. C. Jagan& C. Lakshminarayana, 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 Hall India, 1989.

## **CE408PC: ENGINEERING GEOLOGY & CONCRETE TECHNOLOGY LABORATORY**

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

**L T P C**

**0 0 2 1**

**Course objectives:**

- To provide practical knowledge about physical properties of minerals and rocks.
- To determine the characteristics of cement, Coarse & Fine aggregates.
- To know the test procedures to find the properties of fresh concrete
- To understand the test procedures to find mechanical properties of hardened concrete.
- To know the procedure for concrete mix design.

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

- CO1: Understand the method and ways of investigations required for Civil Engineering projects
- CO2: Identify the various rocks, minerals depending on geological classifications
- CO3: Evaluate the properties of cement, fine and coarse aggregates and determine its suitability for construction.
- CO4: Evaluate the fresh properties of concrete
- CO5: Evaluate the hardened properties of concrete

**List of Experiments:**

**1. Identification of Minerals:**

- a) Silica Group
- b) Feldspar Group
- c) Carbonate Group
- d) Pyroxene Group
- e) Mica Group
- f) Amphibole Group.

**2. Identification of Rocks:**

- a) Igneous Petrology
- b) Sedimentary Petrology
- c) Metamorphic Petrology.

**3. Study of topographical features from Geological maps. Identification of symbols in maps.**

**4. Simple structural Geology Problems (Folds, Faults & Unconformities).**

**5. Tests on Cement:**

- a) Fineness test
- b) Normal Consistency test.
- c) Specific gravity test,
- d) Initial and Final setting time of cement.
- e) Soundness.
- f) Compressive strength.

**6. 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

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

**8. Tests on Fresh Concrete:**

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

**9. Tests on Hardened Concrete:**

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

**CE409PC: RESEARCH PROJECT/ FIELD-BASED PROJECT**

**L T P C**

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

**0 0 4 2**

## **MC410: GENDER SENSITIZATION LABORATORY**

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

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

### **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.

### **COURSE OBJECTIVE:**

- 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 and to expose students to more egalitarian interactions between men and women

### **COURSE OUTCOME:**

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

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
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.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labor and its relation to politics and economics.
5. 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.

**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.

**TEXT BOOK:**

1. “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:**

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

**Note:** 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”.