CO FOR CIVIL ENGINEERING DEPARTMENT

YEAR:SECOND
Semester - III
3CE02 Strength of Materials

CO3CE02.1 Student will gain knowledge about mechanical properties of materials and will understand the concept of different stresses and strains under biaxial and triaxial loading in accordance to different elastic constants. Also student will able to analyze uniaxial stress and strains in compound bar along with temperature stresses.

CO3CE02.2 Student will be able to draw AFD, SFD and BMD for different loading conditions and different types of beams.

CO3CE02.3 Student will be able to analyze bending stresses, shear stresses and strains of every beam.

CO3CE02.4 Student will be able to understand the concept of torsion theory and power transmitted by shaft and analysis the numerical problem also able to understand the concept of closed coil helical spring with axial load and Analysis of thin cylinder subjected to internal pressures.

CO3CE02.5 Student will understand the basic concept of principal stresses and strains and the analysis of combined direct and bending stresses its applications to short column with eccentric loads, retaining wall with horizontal Lateral forces.

CO3CE02.6 Student will be able to Analyze the numerical problems based on slope and deflections of beams by 1) Macaulay's method 2) Moment Area method 3) Conjugate beam method and theory of long columns by Euler's and Rankine's formula.

3CE03 Transportation Engineering-I

CO3CE03.1 Students will gain knowledge about highway considering its development and planning, transport characteristics, classification, patterns, alignment principles, engineering surveys and also they will understand the desirable properties of material requirement associated with it.

CO3CE03.2 Student will able to perform geometric design of highway with reference to different elements influencing it.

CO3CE03.3 Students will gain knowledge about construction and maintenance of different types of roads, components, design factors, stresses, joints which will help them for design of pavement.

CO3CE03.4 Students will become aware about traffic engineering related to traffic characteristics, traffic studies, road parking system, accidental studies, traffic control devices and Motor Vehicle Acts and rules.

CO3CE03.5 Students will understand the bridge engineering related to its components, classification, identification, data collection, site selection, economic span, different structural forms and erection of bridge superstructure.

CO3CE03.6 Student will be able to understand the various aspects of bridge hydrology including its rating and maintenance.

3CE04-Building Construction and Material

CO- 3CE04.1 Students will gain the knowledge about components of building, type of structures and different Foundations.

CO- 3CE04.2 Students will understand technical terms, types and features Stone Masonry, Brick Masonry, construction of Brick Masonry

CO- 3CE04.3 Students will become aware about different types, materials, suitability, construction methods and criteria of selection for roofs and flooring in building.

CO- 3CE04.4 Student will gain knowledge about different types of doors and windows with respect to its components, suitability, size and shape.

CO- 3CE04.5 Students will become aware about different types of Stairs, Lifts, Escalators, Painting, Plastering, Pointing and Scaffolding with based on its suitability and necessity.

CO- 3CE04.6 Students will gain knowledge about special aspects of construction such as Damp Proofing, Fireproof, Soundproof construction and Expansion joints.

3CE05 Engineering Geology

CO3CE05.1 Students will be able to classify and identify rock forming minerals and rocks with its significance to civil engineering.

CO3CE05.2 Students will be able to apply knowledge of structural geology and earthquake engineering

CO3CE05.3 Students will be able to identify rock as a material of construction with respect to its properties and site for different civil engineering projects.

Semester – IV

4CE01: Geotechnical Engineering – I

CO4CE01.1 Students will be able to recognise the behaviour of structure after identifying the properties of different type soil.

CO4CE01.2 Students will identify the way to improve the bearing capacity of foundation soil with the help of compaction techniques.

CO4CE01.3 Students will be able to minimise the problems which cause significant effect on stability of foundations due to permeability.

CO4CE01.4 Students will be able to identify interaction between soils and percolating water which can help them to control the seepage.

CO4CE01.5 Students will be able to improve the strength of soil with the help of consolidation process.

CO4CE01.6 Students will be able to perform lab experiments related to improve the shear strength of soil.

4CE02: Fluid Mechanics - I

CO4CE02.1 Students will understand the physical properties of fluid and able to perform various calculations related to fluid statics as well as dynamics.

CO4CE02.2 Students will be able to deal with the problems related to forces on immersed bodies and also will able to identify the type of flow.

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CO4CE02.3 Students will be able to formulate the total energy of flowing fluid by understanding the concept of Bernoulli's Theorem.

CO4CE02.4 Students will be able to measure the flow parameters of open channel as well as close conduit.

CO4CE02.5 Students will be able to deal with the problems related to Laminar flow through circular pipes and boundary layer theory.

CO4CE02.6 Students will be able to calculate the losses in pipe flow which will help them to analyse the pipe network.

4CE03 Theory of Structures – I

CO4CE03.1 Students will be able to analyze indeterminate beam, frame, fixed beam, propped cantilever and continuous beam for solution of problems.

CO4CE03.2 Students will be able to apply Castigliano's theorem, unit load method, slope deflection method for analysis determinate beams and portal and analyze deflection in determinate beams for problem solutions.

CO4CE03.3 Students will be able to analyze bending moment and shear force for determinate beams by influence line diagram, rolling loads on simply supported beams, concentrated and uniformly distributed loads, maximum shear force, bending moment and focal length.

CO4CE03.4 Students will be able to analyze rolling loads on trusses, forces in the members of simple trusses by influence line diagram, three hinged arches subjected to static load, bending moment, radial shear and axial thrust.

CO4CE03.5 Students will be able to analyze continuous beam with or without sinking of support, portal frames without sides way by slope deflection method.

CO4CE03.6 Students will be able to analyze continuous beam with or without sinking of support, portal frames without sides way by moment distribution method.

4CE04 Surveying - I

CO4CE04.1 Students will gain the knowledge of plane surveying and geodetic surveying and also learn the principle of surveying and different field measurement techniques in civil engineering.

CO4CE04.2 Students will be able to calculate the bearing of all lines in a traverse base on interior or deflection angles and also set-out construction points base on measured angle and distances.

CO4CE04.3 Students will be able to find the field data using differential leveling and determine the undulation of ground surface.

CO4CE04.4 Students will be able to find out horizontal and vertical angles by using theodolite and also calculate the latitude and departure of any point on ground surface.

CO4CE04.5 Students will gain the knowledge of topographical features of the ground by preparing contour map.

CO4CE04.6 Students will be able to understand the application of different instruments used in plane table survey and also understand how to draw a map with real dimensions.

4CE05 Reinforced Cement Concrete- I

CO4CE05.1 Students will gain knowledge of physical properties and types of Portland cement. Student will able to conduct various tests on cement and aggregates. Also study the properties of fresh concrete methods of measuring workability, nominal mix, mixing, centering and formwork, placing, compaction & curing of concrete.

CO4CE05.2 Students will have to develop ability to conduct tests on hardened concrete such as compressive, tensile, shear strength, modulus of elasticity, creep, shrinkage and durability. Also student will have the knowledge about nominal mix, plasticizer, retarders, accelerators, admixtures, IS code provisions

CO4CE05.3 Students will have the knowledge about special type of concrete techniques for various special conditions. Also students will able to use special concreting technique such as guniting, grouting and shotcreting concrete and application of fibrocement

CO4CE05.4 Students will be able to design concrete mix by using various codes such as IS 10262:1982 & Indian Road Congress (IRC-44)

CO4CE05.5 Students will understand and apply the basic concept of elastic theory to analyze different component of structural members (such as rectangular beam, slab, lintels & chajjas) by working stress methods (WSM)

CO4CE05.6 Students will be able to analyze and design of structural member (Doubly reinforced beam), also the concept of designing shear reinforcement for rectangular beam, types of bond, bent up bar and development length

Year:Third
Semester – V
5CE01 Reinforcement Cement Concrete-II

CO5CE01.1 Students will be able to design of circular & rectangular water tank by working stress method with rigid and flexible base on firm ground.

CO5CE01.2 Students will be able to understand basic concepts of limit state methods in comparison of working stress method, also they will able to design one way single span and continuous span slab.

CO5CE01.3 Students will be able to analyse and design two way slab and doglegged staircases

CO5CE01.4 Students will be able to analyse and design of beam, rectangular and flanged section for bending moment and shear

CO5CE01.5 Students will be able to analyse and design of column for axial load, uniaxial and biaxial bending and isolated footing

CO5CE01.6 Students will be able to design grid slab by IS codes method and will understood details for earthquake resistant construction along with significant of ductile details for beam, column ,joint and shear wall.

5CE02-Fluid Mechanics-II

CO5CE02.1 Students will be able to understand and analyse turbulent flow through pipes.

CO5CE02.2 Students will be able to analyse the geometric elements of rectangular and trapezoidal open channel section considering energy losses.

CO5CE02.3 Students will be able to understand and analyse Gradually varied flow and Rapidly varied flow considering its behavior.

CO5CE02.4 Students will be able to perform dimensional analysis by understanding Bunckingham's Pi theorem and dimensionless numbers also students will able to do model analysis by using Reynold's and Froud's law with special reference to study of spillways.

CO-5CE02.5 Students will gain the knowledge about hydraulic turbines with reference to their classification and calculation of work done, power and efficiency. Also, students will understand the concept of impact of jet, symmetrical, asymmetrical, curved vanes and velocity diagram.

CO-4CE02.6 Students will be able to understand and analyse different types of pumps and its working.

5CE03 Building Planning and CAD

CO5CE03.1 Students will gain knowledge about different methods, types, dimensions, abbreviations, projections and sheet layouts in building drawings for Civil Engineering.

CO5CE03.2 Students will be able to understand line plans and working drawings with necessary details in it.

CO5CE03.3 Students will be able to plan different residential buildings considering different criteria as per requirements.

CO5CE03.4 Students will understand the importance of rules and by laws applicable for developing residential buildings, planning of public buildings also he will be able to sketch different features and components of buildings.

CO5CE03.5 Students will be able to understand commands of computer aided drawing and will able to develop plans using AutoCAD.

5CE04 Surveying – II

CO5CE04.1 Students will understand the different methods of tacheometry and also prepare a contour map for investigation works within a short time on the basis of tacheometric survey.

CO5CE04.2 Students will get brief idea about different types of curves, its classification, elements and methods of setting out which is useful during the survey of the alignment of project involving roads and railways.

CO5CE04.3 Students will gain knowledge of principles of triangulation and also establish accurately located control point for plane and geodetic survey.

CO5CE04.4 Students will gain knowledge of hydrographic surveying and underground surveying for marking alignment and transferring levels underground.

CO5CE04.5 Students will become aware about terrestrial and aerial photography, remote sensing its advantages and characteristics.

CO5CE04.6 Students will get idea about field astronomy and spherical trigonometry and learn importance of GIS and GPS in civil engineering.

5FECE05 Free Elective-I: Basics of Building Construction

CO5FECE05.1 Students will gain the knowledge about components of building, type of structures and different Foundations.

CO5FECE05.2 Students will understand technical terms, types and features Stone Masonry, Brick Masonry, construction of Brick Masonry.

CO5FECE05.3 Students will become aware about different types, materials, suitability, construction methods and criteria of selection for roofs and flooring in building.

CO5FECE05.4 Student will gain knowledge about different types of doors and windows with respect to its components, suitability, size and shape.

CO5FECE05.5 Students will become aware about different types of Stairs, Lifts, Escalators, Painting, Plastering, Pointing and Scaffolding with based on its suitability and necessity

CO5FECE05.6 Students will gain knowledge about special aspects of construction such as Damp Proofing, Fireproof, Soundproof construction and Expansion joints

5CE06 Communication Skills

CO5CE06.1: Students will be able to demonstrate the knowledge of words, passages and sentences during communication.

CO5CE06.2: Students will be able to compare verbal and non-verbal communication considering its significance (ethical values).

CO5CE06.3: Students will be able to perform written and oral communication using different formats and methods.

Semester – VI

6CE01 Numerical methods And Computer Programming

CO6CE01.1 Student will be able to understand basic grammar of FORTRAN, use of coding sheet, format for input output statement, flowchart to write the programs in compiler.

CO6CE01.2 Student will be able to learn and develop the program by using different syntax of Control statements like IF, GOTO & DO statements, DIMENSION statement and DATA statement.

CO6CE01.3 Student will be able to analyze the difference between program and subprogram and were to utilize these subprogram by using different arguments and there syntax.

CO6CE01.4 Student will be able to analyze and develop the programs to solve mathematical problems related with matrices and ordinary differential equation.

CO6CE01.5 Student will be able to analyze and develop the programs to solve quadratic equation, Numerical integral using Trapezoidal and Simpson rule, finding root of equation .using different methods

CO6CE01.6 Student will be able to analyze and develop the programs related with civil engineering applications in different subjects like engineering mechanics, strength of material, RCC design, geotechnical engineering, surveying and fluid mechanics.

6CE02 Design of Structures-I

CO6CE02.1 Students will be able to design bolted and welded connections subjected to axial loading.

CO6CE02.2 Students will be able to design compression members, tension members and industrial shed.

CO6CE02.3 Students will be able to design simple column, compound column, for axial and eccentric loading and columns subjected to axial load and moment, gusseted base and solid slab base.

CO6CE02.4 Students will be able to design simple beam, compound beams and welded plate girder.

6CE03: Water Resources Engineering - I

CO6CE03.1 Students will be able to estimate, analyse and measure the precipitation data by using various techniques.

CO6CE03.2 Students will be able to determine the parameters to measure and analyse the hydrological events like Evapotranspiration and Infiltration.

CO6CE03.3 Students will be able to give the technical solutions on flood forecasting and flood control.

CO6CE03.4 Students will understand the concept of Minor Irrigation work.

CO6CE03.5 Students will be able to suggest proper Irrigation system design for different crops among various constraints.

CO6CE03.6 Students will understand the concept of well hydraulics and will able to design the rainwater Harvesting system.

6CE04: Trasportation Engineering-II

CO6CE04.1 Students will be able to calculate resistances offered by various parameters which affects railway transportation.

CO6CE04.2 Students will be able to design the parameters related to permanent way in Railway Transportation.

CO6CE04.3 Students will be able deal with the problems related to signalling and interlocking in Railway Movement.

CO6CE04.4 Students will understand the basic Design concepts of Airport.

CO6CE04.5 Students will be able to Design the Aircraft parking.

CO6CE04.6 Students will able to deal with the problems related to construction of Tunnels.

6CE06: Estimating and Costing

CO6CE06.1 Student will be able to understand modes of measurement and units of measurement, methods of estimating, specification required to building , also they will able to understand measurement of rooms

CO6CE06.2 Student will be able to understand importance of Schedule of Rates in Estimating and Costing, Fixed, Variable Prime and Supplementary cost, Recommendations from N.B.O for Task work, No. of workman and they will able to carry out the rate analysis of specific items including Transportation Cost.

CO6CE06.3 Student will be able to understand detailed estimate of Civil Engineering Works and various forms used for detailed estimates.

CO6CE06.4 Student will be able to Calculate Earthwork required for Roads including Hill road and also they will able to understand Earthwork required for Earthen dams

CO6CE06.5 Student will be able to understand basic concepts Related to Valuation, market value, potential value, potential value, sentimental value, scrap value and also understand sinking fund, Depreciation, Capitalized value of a Old Building.

CO6CE06.6 Student will be able to understand P.W.D Organization, BOT role of Govt. department as Construction agency and also they will able to understand Methods of carrying out works and Tender Notices, Contract documents, Land Acquisition Act and Legal aspects of various contract provision.

Year:Fourth
Semester – VII
7CE01 Theory of Structures – II

CO7CE01.1 Students will be able to analyze the portal frame with sway. Multibay, multistoried, symmetrical frames by Moment distribution method as well as slope and deflection method.

CO7CE01.2 Students will be able to analyze continuous beams and single bay single storey portal frames with side sway, Multi- bay, multi storeyed frames subjected to symmetric loads by Kanis Method.

CO7CE01.3 Students will be able to analyze the redundant frames by Castigliano's second theorem and study the principle of least work, lack of fit, temperature effect.

CO7CE01.4 Students will be able to study the Maxwell's reciprocal theorem, Betty's theorem, Muller - Breslau's principle, Influence line diagrams for continuous beams.

CO7CE01.5 Students will be able to study the Flexibility method, static redundancy, flexibility coefficients, compatibility condition application to beams Introduction to plastic analysis of steel structure, shape factor, plastic section modulus, Redistribution of moment, upper and lower bound theorems, collapse loads for beams, single bay, single storey portals.

CO7CE01.6 Students will be able to analyze continuous beams and single - bay, single - storey portal by Stiffness method.

7CE02 Geotechnical Engineering – II

CO7CE02.1 Students will get knowledge of site specific field investigations including collection of soil samples for testing and observation of soil behavior.

CO7CE02.2 Students will be able to understand the basic concept of ultimate bearing capacity of shallow foundations including modification of bearing capacity equations for water table, factor of safety.

CO7CE02.3 Students will be able to understand the concept of Lateral Earth Pressure and including Rankine's theory of active and passive earth pressures with and without sloping backfill.

CO7CE02.4 Students will be able to explain in what circumstances pile is needed and how to analyse the pile and pile group under various soil conditions.

CO7CE02.5 Students will be able to estimate the amount of consolidation and settlement and time required for settlement under a given load.

CO7CE02.6 Students will be able to explain overall stability analysis of well foundation And to analyse earth retaining structures for any kind of soil medium.

7CE03 Structures Design - II

CO7CE03.1 Students will be able to design interior panel of flat slab by direct design method as well as Design of cantilever retaining wall and Counterfort retaining wall.

CO7CE03.2 Students will be able to design of combined footing, design of simple, small structures like Canopies & Parking shed.

CO7CE03.3 Students will be able to study of Prestressed concrete, various methods of prestressing systems, Losses of prestress and Analysis of beams for flexure, under working load for Rectangular and flanged sections.

CO7CE03.4 Students will be able to design of prestressed concrete circular water, one way single span slab.

7CE04 Environmental Engineering - I

CO7CE04.1 Students will be able to evaluate demand and consumption of water to get design period of water supply from various water sources.

CO7CE04.2 Students will be able to analyze the impurities in water and their effect for different water treatment works.

CO7CE04.3 Students will be able to analyze the aeration process and design of sedimentation tank.

CO7CE04.4 Students will be able to analyze different filtration process for design of simple rapid sand filters.

CO7CE04.5 Students will be able to analyze different methods of disinfections for solution of problems.

CO7CE04.6 Students will be able to analyze, design and maintain distribution system from storage reservoirs.

7CE05 Professional Elective-I: Advanced Earthquake Engineering

CO7CE05.1 Students will gain knowledge about Behaviour of structures in past earthquakes.

CO7CE05.2 Students will gain knowledge about seismic analysis of building using Codal Provision.

CO7CE05.3 Students will gain knowledge about introduction of seismic design bridges, dams, chimneys.

CO7CE05.4 Students will gain knowledge about Vulnerability of building.

CO7CE05.5 Students will gain knowledge about concept in repair, restoration, Seismic strengthening & retrofitting.

CO7CE05.6 Students will gain knowledge about methodologies for repairs for walls, roofs, slabs, columns and foundations of buildings in stone, brick or reinforced concrete.