SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)
Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF CIVIL ENGINEERING
REGULATION 2017
COURSE OUTCOMES (CO)

SEMESTER I	
HS8151 COMMUNICATIVE ENGLISH	
Students will be able to	
CO1	Develop vocabulary of a general kind by developing their reading skills
CO2	Explain their opinions in English and Participate effectively in informal conversations; introduce themselves and their friends.
CO3	Comprehend conversations and short talks delivered in English.
CO4	Write short essays of a general kind and personal letters and emails in English.
CO5	Develop their speaking skills and speak fluently in real contexts.
CO6	Discuss about the general kind in magazines and newspapers.

MA8151 ENGINEERING MATHEMATICS – I	
Students will be able to	
CO1	Apply the limit definition and rules of differentiation to differentiate functions.
CO2	Apply differentiation to solve maxima and minima problems.
CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables
CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
CO6	Apply various techniques in solving differential equations.

PH8151 ENGINEERING PHYSICS	
Students will be able to	
CO1	Explain the basics of properties of matter and its applications.
CO2	Describe the characteristics of laser light and their application in semiconductor laser
CO3	Discuss the principle behind the propagation of light through an optical fibre and its application in sensors
CO4	Summarize the different modes of heat transfer.
CO5	Relate the quantum concepts in electron microscopes
CO6	Describe the unit cell characteristics and the growth of crystals.

CY8151 ENGINEERING CHEMISTRY	
Students will be able to	
CO1	Summarize the water related problems in boilers and their treatment techniques.
CO2	Discuss the applications of adsorption in the field of water and air pollution abatement.
CO3	Discuss the types of catalysis and the mechanism of enzyme catalysis
CO4	Apply phase rule in the alloying and the behaviour of one component and two component systems using phase diagram
CO5	Explain various types of fuels, their manufacturing processes and calculation of calorific theoretically
CO6	Summarize the principles and generation of energy in batteries ,nuclear reactors, solar cells, wind mills and fuel cells

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GE8151 PROBLEM SOLVING AND PYTHON PROGRAMMING	
Students will be able to	
CO1	Explain the basics of fundamentals of computing.
CO2	Describe the basics of algorithmic problem solving.
CO3	Solve problems using Python conditionals and loops.
CO4	Define Python functions and use function calls to solve problems
CO5	Apply Python data structures - lists, tuples, and dictionaries to represent complex data.
CO6	Explain the importance of Read and write data from/to files in Python programs.

GE8152 ENGINEERING GRAPHICS	
Students will be able to	
CO1	Explain the fundamentals and standards of Engineering graphics
CO2	Draw freehand sketching of basic geometrical constructions and multiple views of objects.
CO3	Design orthographic projections of lines and plane surfaces.
CO4	Draw projections and solids and development of surfaces.
CO5	Visualize and to project isometric and perspective sections of simple solids.
CO6	Relate existing national standards to technical drawings.

GE8161 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	
Students will be able to	
CO1	Develop algorithmic solutions to simple computational problems
CO2	Design and execute simple Python programs.
CO3	Solve programs in Python using conditionals and loops for solving problems.
CO4	Apply functions to decompose a Python program.
CO5	Analyze compound data using Python data structures.
CO6	Utilize Python packages in developing software applications.

BS8161 PHYSICS AND CHEMISTRY LABORATRY	
Students will be able to	
CO1	Determine the Modulus of elasticity of materials and Coefficient of Viscosity of liquids.
CO2	Determine the Thermal Conductivity of bad conductor using Lee's disc method.
CO3	Determination of wavelength, and particle size using Laser and Determination of acceptance angle in an optical fibre.
CO4	Calculate water quality parameters such as hardness, alkalinity of the given water sample.
CO5	Estimate the amount of the given acids using pH titrations.
CO6	Determine the amount of iron content in the given substance using potentiometric titration and Determine the amount of chloride content in the given water sample

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SEMESTER II	
HS8251 TECHNICAL ENGLISH	
Students will be able to	
CO1	Apply strategies in reading and comprehending engineering and technology text.
CO2	Use convincing job applications.
CO3	Apply speaking skill to make technical presentations.
CO4	Use the formats for effective report writing.
CO5	Apply speaking skill to participate in group discussions.
CO6	Apply the active listening skills to comprehend lectures and technical talks.

MA8251 ENGINEERING MATHEMATICS – II	
Students will be able to	
CO1	Describe about the Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
CO2	Apply Gradient, divergence and curl of a vector point function and related identities.
CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
CO4	Evaluate the problems based on Analytic functions, conformal mapping and complex integration.
CO5	Explain about the Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
CO6	Evaluate the linear second order differential equations with constant coefficients

PH8201 PHYSICS FOR CIVIL ENGINEERING	
Students will be able to	
CO1	Explain about the thermal performance of buildings.
CO2	Describe the acoustic properties of buildings.
CO3	Illustrate about the various lighting designs for buildings.
CO4	Explain the properties and performance of engineering materials.
CO5	Explain about the various hazards of buildings.
CO6	Describe about the principles of optics and new materials for civil engineering applications.

BE8251BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	
Students will be able to	
CO1	Identify the electrical components and explain the characteristics of electrical machines.
CO2	Identify electronics components and understand the characteristics
CO3	Explain the basic theorems used in Electrical circuits and the different components and function of electrical machines.
CO4	Explain the fundamentals of semiconductor and applications.
CO5	Explain the principles of digital electronics
CO6	Develop the knowledge of communication.

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GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING	
Students will be able to	
CO1	Discover the public participation is an important aspect which serves the environmental protection.
CO2	Describe the population explosion and family welfare programme and the value of education and human rights.
CO3	Recall public awareness of environmental is at infant stage.
CO4	List the ignorance and incomplete knowledge has lead to misconceptions.
CO5	Development and improvement in standard. of living has lead to serious environmental disasters.
CO6	Explain the various resources such as forest, mineral water and case studies of land and energy resources

GE8292 ENGINEERING MECHANICS	
Students will be able to	
CO1	Illustrate the vectorial and scalar representation of forces and moments
CO2	Analyse the rigid body in equilibrium
CO3	Evaluate the properties of surfaces and solids
CO4	Calculate dynamic forces exerted in rigid body
CO5	Determine the friction
CO6	Analyse the effects by the laws of friction

GE8261 ENGINEERING PRACTICES LABORATORY	
Students will be able to	
CO1	Fabricate carpentry components and pipe connections including plumbing works.
CO2	Use welding equipments to join the structures
CO3	Carry out the basic machining operations
CO4	Make the models using sheet metal works
CO5	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
CO6	Carry out basic home electrical works and appliances

CE8211 COMPUTER AIDED BUILDING DRAWING	
Students will be able to	
CO1	Draft the plan, elevation and sectional views of the buildings, industrial structures, and framed buildings using computer software.
CO2	Draft the Principles of planning, orientation and complete joinery details (Paneled and Glazed Doors and Windows)
CO3	Draft the Buildings with load bearing walls
CO4	Draft the Buildings with sloping roof
CO5	Draft the R.C.C. framed structures.
CO6	Draft the Industrial buildings – North light roof structures

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SEMESTER III	
MA8353 - TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	
Students will be able to	
CO1	Explain how to solve the given standard partial differential equations.
CO2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
CO3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
CO4	Explain the mathematical principles on transforms and partial differential equations would provide them the ability to formulate
CO5	Solve some of the physical problems of engineering.
CO6	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

CE8301-STRENGTH OF MATERIALS-I	
Students will be able to	
CO1	Explain the concepts of stress and strain, principal stresses and principal planes.
CO2	Determine Shear force and bending moment in beams and explain concept of theory of simple bending.
CO3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
CO4	Apply basic equation of torsion in design of circular shafts and helical springs
CO5	Analyze the pin jointed plane trusses
CO6	Analyze the pin jointed space trusses

CE8302-FLUID MECHANICS	
Students will be able to	
CO1	Explain the terms fluids in static, kinematic and dynamic equilibrium.
CO2	Explain and solve the problems related to equation of motion.
CO3	Describe about dimensional and model analysis for water flow
CO4	Explain the various types of flow and losses of flow in pipes.
CO5	Explain and solve the boundary layer problems
CO6	Explain laminar and turbulent boundary layer

CE8351-SURVEYING	
Students will be able to	
CO1	Explain various surveying instruments and mapping
CO2	Describe Horizontal angle and vertical angle using different instruments
CO3	Explain the various Methods of Leveling and setting Levels with different instruments
CO4	Describe the Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth
CO5	Describe the Concept and principle of modern surveying.
CO6	Explain triangulation and traversing surveying

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COURSE OUTCOMES (CO)

CE8391-CONSTRUCTION MATERIALS	
Students will be able to	
CO1	Compare the properties of most common and advanced building materials
CO2	Explain the typical and potential applications of lime, cement and aggregates
CO3	Describe the production of concrete and also the method of placing and making of concrete elements.
CO4	Explain the applications of timbers and other materials
CO5	Explain the importance of modern material for construction.
CO6	Describe the applications of laminar composites

CE8392-ENGINEERING GEOLOGY	
Students will be able to	
CO1	Explain the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies.
CO2	Explain the properties of minerals.
CO3	Describe about types of rocks, their distribution and uses.
CO4	Explain the methods of study on geological structure.
CO5	Explain the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor
CO6	Explain the application of geological investigation in coastal protection structures

CE8311-CONSTRUCTION MATERIALS LABORATORY	
Students will be able to	
CO1	Describe the area of testing of construction materials experimentally.
CO2	Explain about testing of components of construction elements experimentally.
CO3	Explain the behavior of the construction materials
CO4	Determine the water absorption and Efflorescence of bricks
CO5	Determine the Compressive strength for Cube & Cylinder
CO6	Determine impact value and crushing value of coarse aggregate

CE8361 SURVEYING LABORATORY	
Students will be able to	
CO1	Describe the handling methods of basic survey instruments including Theodolite & Tacheometry
CO2	Explain Triangulation and Astronomical surveying including general field marking for various engineering projects and Location of site etc.
CO3	Describe about the determination of distance and difference in elevation between two inaccessible points using total station.
CO4	Explain about Total Station and GPS
CO5	Determine the elevation of an object using single plane method when base is accessible / inaccessible.
CO6	Determine Heights and distances by Tangential and Stadia Tacheometry

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COURSE OUTCOMES (CO)

HS8381-INTERPERSONAL SKILLS/LISTENING & SPEAKING	
Students will be able to	
CO1	Listen and respond appropriately
CO2	Participate in group discussions
CO3	Develop communication skills.
CO4	Participate confidently and appropriately in conversations both formal and informal
CO5	Improve general and academic listening skills
CO6	Prepare effective presentations

SEMESTER IV	
MA8491-NUMERICAL METHODS	
Students will be able to	
CO1	**E**xplain the basic concepts and techniques of solving algebraic and transcendental equations.
CO2	Apply the numerical techniques of interpolation and error approximations in various intervals in real life situations.
CO3	Apply the numerical techniques of differentiation for engineering problems.
CO4	Apply the numerical techniques of integration for engineering problems.
CO5	Explain the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO6	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

CE8401 CONSTRUCTION TECHNIQUES AND PRACTICES	
Students will be able to	
CO1	Describe the different construction techniques and structural systems
CO2	Explain various techniques and practices on masonry construction, flooring, and roofing.
CO3	Explain the requirements for substructure construction.
CO4	Describe the methods and techniques involved in the construction of various types of super structures
CO5	Selection, maintenance and operation of hand held power tools and equipments used in the building construction sites.
CO6	Describe the usage of various equipments for dredging, trenching and tunneling

CE8402 STRENGTH OF MATERIALS II	
Students will be able to	
CO1	Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.
CO2	Analyze propped cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements.
CO3	Find the load carrying capacity of columns and stresses induced in columns and cylinders

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COURSE OUTCOMES (CO)

CO4	Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure
CO5	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center.
CO6	Determine the stresses in curved beams.

CE8403 APPLIED HYDRAULIC ENGINEERING	
Students will be able to	
CO1	Apply their knowledge of fluid mechanics in addressing problems in open channels.
CO2	Identify a effective section for flow in different cross sections
CO3	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.
CO4	Explain the principles, working and application of turbines.
CO5	Explain the principles, working and application of pumps.
CO6	Explain the concept of Air vessels, indicator diagrams and its variations

CE8404 CONCRETE TECHNOLOGY	
Students will be able to	
CO1	Identify The various requirements of cement, aggregates and water for making concrete
CO2	Describe the effect of admixtures on properties of concrete
CO3	Explain The concept and procedure of mix design as per IS method
CO4	Explain The properties of concrete at fresh and hardened state
CO5	Explain about the importance of special concretes in various environmental conditions
CO6	Explain the application of various special concrete

CE8491 SOIL MECHANICS	
Students will be able to	
CO1	Classify the soil and assess the engineering properties, based on index properties
CO2	Explain the stress concepts in soils
CO3	Explain and identify the settlement in soils.
CO4	Determine the shear strength of soil
CO5	Analyze both finite and infinite slopes.
CO6	Explain the guidelines for location of critical slope surface in cohesive soils

CE8481 STRENGTH OF MATERIALS LABORATORY	
Students will be able to	
CO1	Explain about the area of testing of materials under the action of various forces.
CO2	Explain the testing of various components of structural elements experimentally.
CO3	Determine the tensile and torsion test on steel rod
CO4	Determine hardness test on metals (Rockwell and Brinell Hardness Tests)
CO5	Determine the deflection test on metal beam and carriage spring
CO6	Determine the deflection test on metal beam and helical spring

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CE8461 HYDRAULIC ENGINEERING LABORATORY	
Students will be able to	
CO1	Explain The Measurement Of Flow In Pipes .
CO2	Develop Characteristics Of Pumps .
CO3	Develop Characteristics Of Turbines.
CO4	Determine Frictional Losses.
CO5	Determine The Metacentric Height
CO6	Illustrate The Calibration Of Venturimeter / Orificemeter And Rotameter

HS8461 ADVANCED READING AND WRITING	
Students will be able to	
CO1	Apply effective reading skills
CO2	Write different types of essays.
CO3	Write winning job applications
CO4	Demonstrate critical thinking in various professional contexts.
CO5	Apply critical thinking to evaluate the text read.
CO6	Develop their project and proposal writing skills

SEMESTER V	
CE8501-DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS	
Students will be able to	
CO1	Explain the various design methodologies for the design of RC elements
CO2	Describe the analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion.
CO3	Design the various types of slabs and staircase by limit state method.
CO4	Design columns for axial, uniaxial and biaxial eccentric loadings.
CO5	Explain the concept of proportioning footings and foundations based on soil properties
CO6	Design of footing by limit state method.

CE8502-STRUCTURAL ANALYSIS I	
Students will be able to	
CO1	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
CO2	Analyse the continuous beams and rigid frames by slope defection method.
CO3	Explain the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
CO4	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
CO5	Explain the concept of matrix stiffness method and analysis of continuous beams.
CO6	Analyse the pin jointed trusses and rigid plane frames using matrix stiffness method

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EN8491-WATER SUPPLY ENGINEERING	
Students will be able to	
CO1	Explain the structure of drinking water supply systems, including water transport, treatment and distribution
CO2	Describe the various unit operations and processes in water treatment
CO3	Design the various functional units in water treatment
CO4	Explaining of water quality criteria and standards, and their relation to public health
CO5	Design and evaluate water supply project alternatives on basis of chosen criteria.
CO6	Explain the components about requirements and components of water distributions.

CE8591-FOUNDATION ENGINEERING	
Students will be able to	
CO1	Explain the site investigation, methods and sampling.
CO2	Explain the bearing capacity and testing methods.
CO3	Design shallow footings.
CO4	Determine the load carrying capacity, settlement of pile foundation.
CO5	Determine the earth pressure on retaining walls using various theories
CO6	Determine the stability analysis of retaining walls

GE8074-HUMAN RIGHTS	
Students will be able to	
CO1	Explain the basic knowledge of human rights.
CO2	Describe about natural, moral and legal rights
CO3	Analyse the concept of Human Rights Magana carta
CO4	Explain the perspectives of UN Laws
CO5	Analyse the concept of Human Rights of Disadvantaged People
CO6	Apply the implementation of Human Rights

ORO551-RENEWABLE ENERGY SOURCES	
Students will be able to	
CO1	Explain the physics of solar radiation.
CO2	Classify the solar energy collectors and methodologies of storing solar energy.
CO3	Apply the usage of solar energy in real world problems to generate electrical power .
CO4	Explain the requirements of wind energy and biomass with its economic aspects
CO5	Describe the methods of capturing and applying other forms of energy sources like wind, biogas and geothermal energies to generate electrical power.
CO6	Explain the direct form of energy conversion methods.

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CE8511-SOIL MECHANICS LABORATORY	
Students will be able to	
CO1	Conduct tests to determine both the index and engineering properties of soils.
CO2	Characterize the soil based on their properties.
CO3	Determine insitu density and compaction characteristics
CO4	Describe the determination of relative density
CO5	Determine the Unconfined compression test and vane shear test in cohesive soil
CO6	Determine the moisture – density relationship using standard Proctor compaction test

CE8512-WATER AND WASTE WATER ANALYSIS LABORATORY	
Students will be able to	
CO1	Explain the pollutant concentration in water and wastewater
CO2	Describe the type of treatment required and amount of dosage required for waste water treatment
CO3	**E**xamine the conditions for the growth of micro-organisms
CO4	Analyse the physical, chemical and biological characteristics of water and waste water
CO5	Perform coliform analysis
CO6	Perform pathogenic and non pathogenic analysis

CE8513-SURVEY CAMP	
Students will be able to	
CO1	Explain the Radial tachometric contouring
CO2	Determine latitude and longitude and locate the survey camp location using GPS
CO3	Describe about Curve setting by deflection angle
CO4	Explain the location of Offset for Buildings
CO5	Describe Traversing using GPS
CO6	Explain L.S & C.S survey for Road and canal alignment

SEMESTER VI

CE8601-DESIGN OF STEEL STRUCTURAL ELEMENTS	
Students will be able to	
CO1	Explain the concepts of various design philosophies
CO2	Design common bolted and welded connections for steel structures
CO3	Design tension members and explain the effect of shear lag.
CO4	Explain the design concept of axially loaded columns and column base connections.
CO5	Explain specific problems related to the design of laterally restrained and unrestrained steel beams.
CO6	Design of purlin in roof trusses and also design channel and I section purlins

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CE8602-STRUCTURAL ANALYSIS II	
Students will be able to	
CO1	Draw influence lines for statically determinate structures and calculate critical stress resultants.
CO2	Explain Muller Breslau principle and draw the influence lines for statically indeterminate beams.
CO3	Analyse of three hinged, two hinged and fixed arches.
CO4	Analyse the suspension bridges with stiffening girders
CO5	Explain the concept of Plastic analysis and the method of analyzing beams and rigid frames
CO6	Determine plastic moment of resistance and shape factor for various sections.

CE8603-IRRIGATION ENGINEERING	
Students will be able to	
CO1	Describe crop water requirements
CO2	Explain the methods and management of irrigation.
CO3	Explain types of Impounding structures
CO4	Explain methods of irrigation including canal irrigation
CO5	Describe water management on optimization of water use.
CO6	Illustrate water resources association

CE8604-HIGHWAY ENGINEERING	
Students will be able to	
CO1	Explain about the planning and alignment of highway.
CO2	Describe the Geometric design of highways
CO3	Design flexible and rigid pavements.
CO4	Explain Highway construction materials, properties, testing methods
CO5	Explain the concept of pavement management system, evaluation of distress and maintenance of pavements.
CO6	Describe about the various methods for strengthening of pavements

EN8592-WASTEWATER ENGINEERING	
Students will be able to	
CO1	Explain about the sewage generation and design sewer system including sewage pumping stations
CO2	Describe the various characteristics and composition of sewage, self purification of streams
CO3	Perform basic design of the unit operations and processes that are used in sewage treatment
CO4	Explain about the standard methods for disposal of sewage.
CO5	Describe about the process of sludge treatment and disposal.
CO6	Explain about sludge conditioning and dewatering

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CE8005-AIR POLLUTION AND CONTROL ENGINEERING	
Students will be able to	
CO1	Identify the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
CO2	Identify, formulate and solve air and noise pollution problems
CO3	Design stacks and particulate air pollution control devices to meet applicable standards.
CO4	Select control equipments.
CO5	Ensure quality, control and preventive measures.
CO6	Explain about the sick building syndrome and building related illness

CE8611-HIGHWAY ENGINEERING LABORATORY	
Students will be able to	
CO1	Describe about the various pavement materials through relevant tests.
CO2	Explain about various test on aggregates
CO3	Perform specific gravity and viscosity test for bitumen
CO4	Perform Marshall Stability and Flow Values on bituminious mixes
CO5	Determine stripping value and binder content on bituminious mixes
CO6	Perform penetration and Softening Point Test for bitumen

CE8612-IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING	
Students will be able to	
CO1	Design and draw various units of Municipal water treatment plants.
CO2	Design and draw various units of sewage treatment plants.
CO3	Design tank components
CO4	Explain about the various impounding structures
CO5	Design cross drainage works and canal regulation structures
CO6	Explain the concept of design of irrigation structures.

HS8581-PROFESSIONAL COMMUNICATION	
Students will be able to	
CO1	Make effective presentations
CO2	Participate confidently in Group Discussions
CO3	Attend job interviews and be successful in them
CO4	Develop adequate Soft Skills required for the workplace
CO5	Make them Employable Graduates
CO6	Develop their confidence and help them attend interviews successfully.

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SEMESTER VII	
CE8701-ESTIMATION, COSTING AND VALUATION ENGINEERING	
Students will be able to	
CO1	Illustrate about the quantities required for building construction.
CO2	Describe about the Rate Analysis for all Building works, canals, and Roads and Cost Estimate.
CO3	Explain types of specifications, principles for report preparation, tender notices types.
CO4	Explain various types of contracts
CO5	Evaluate valuation for building and land.
CO6	Calculate rent, mortgage and lease value for buildings

CE8702-RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING	
Students will be able to	
CO1	Explain the methods of route alignment and design elements in Railway Planning and Constructions.
CO2	Explain the Construction techniques and Maintenance of Track laying and Railway stations.
CO3	Describe about the planning and site selection of Airport Planning and design
CO4	Analyze and design the elements for orientation of runways and passenger facility systems.
CO5	Explain the various features in Harbours and Ports.
CO6	Explain about the harbour and port construction, coastal protection works and coastal Regulations to be adopted.

CE8703-STRUCTURAL DESIGN AND DRAWING	
Students will be able to	
CO1	Design and draw reinforced concrete Cantilever and Counterfort Retaining Walls
CO2	Design and draw flat slab as per code provisions
CO3	Design and draw reinforced concrete and steel bridges
CO4	Design and draw reinforced concrete and steel water tanks
CO5	Design and detail the various steel trusses and cantry girders
CO6	Design of eccentric shear and moment resisting connections

EN8591-MUNICIPAL SOLID WASTE MANAGEMENT	
Students will be able to	
CO1	Explain about the nature and characteristics of municipal solid wastes and the regulatory requirements regarding municipal solid waste management.
CO2	Explain the process of Reduction, reuse and recycling of waste.
CO3	Describe about the plan and design systems for storage, collection, transport, processing and disposal of municipal solid waste.
CO4	Illustrate the issues on solid waste management from an integrated and holistic perspective, as well as in the local and international context.
CO5	Explain the Design and operation of sanitary landfill.
CO6	Describe about the dumpsite rehabilitation

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COURSE OUTCOMES (CO)

OTT752-TEXTILE EFFLUENT TREATMENTS	
Students will be able to	
CO1	Explain the textile processing related causes for pollution
CO2	Explain the effluent discharge standards and different processes involved in waste water treatment
CO3	Perform the research and development to produce zero discharge effluents
CO4	Describe about the various process in tertiary treatment
CO5	Illustrate the properties of air pollutants and its control measures
CO6	Explain the noise pollution, noise measurement and control of noise pollution.

CE8711-CREATIVE AND INNOVATIVE PROJECT	
Students will be able to	
CO1	Design building elements
CO2	Explain the concepts of building design philosophies
CO3	Explain the concept of codal provisions
CO4	Describe about the guidelines used for design procedure
CO5	Improve their creativity and presentation skills
CO6	Illustrate about the various planning and designing softwares

CE8712-INDUSTRIAL TRAINING	
Students will be able to	
CO1	Describe about the various construction management techniques.
CO2	Explain the concepts of developments and implementation of new techniques
CO3	Develop skills in facing and solving the field problems.
CO4	Compare their theoretical knowledge with practical experience
CO5	Explain about the construction site and office based work practically
CO6	Illustrate planning and designing software used for construction work.

SEMESTER VIII	
GE8076-PROFESSIONAL ETHICS IN ENGINEERING	
Students will be able to	
CO1	Describe basic purpose of profession, professional ethics and various moral and social issues
CO2	Explain about the various professional rights and responsibilities of a Engineer, safety and risk benefit analysis of a Engineer
CO3	Illustrate about various roles of Engineer In applying ethical principles at various professional levels
CO4	Describe professional Ethical values and contemporary issues
CO5	Explain about the competitive and challenging environment to contribute to industrial growth.
CO6	Compare academic learning with experimental learning in a profession.

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COURSE OUTCOMES (CO)

CE8021-STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING	
Students will be able to	
CO1	Explain about the various simulation and mathematical model development.
CO2	Explain the process of identify, formulate and solve complicated problem.
CO3	Explain the role of natural calamity in the damage of structures.
CO4	Develop the skill to analyse data and to apply the same in the practical problems.
CO5	Apply the developed methodologies for the safe and stable design of structures.
CO6	Design earthquake resistant structures using IS codes.

CE8811-PROJECT WORK	
Students will be able to	
CO1	Describe about how to take up any challenging practical problems.
CO2	Illustrate about finding solution by formulating proper methodology.
CO3	Explain the importance of codal provisions
CO4	Explain about the problem solving techniques in civil engineering
CO5	Improve their technical and presentation skills
CO6	Describe about solution finding methods for practical problems