



PRATHYUSHA ENGINEERING COLLEGE
DEPARTMENT OF CIVIL ENGINEERING
COURSE WITH COURSE OUTCOMES FOR 2013 REGULATION

COURSE CODE	COURSE NAME	COURSE OUTCOME
HS6151	TECHNICAL ENGLISH – I	CO1: Apply the collaborative and social aspects of research and writing processes.
		CO2: Comprehend that research and writing is a series of tasks, including accessing, retrieving, evaluating, analyzing and synthesizing appropriate data and information from sources that vary in
		CO3: Use appropriate technologies to organize, present and communicate information to address a range of audiences, purposes and genres.
		CO4: Explain the relationships among language, knowledge and power including social, cultural, historical and economic issues related to information, writing and technology.
		CO5: Demonstrate the role of a variety of technologies/ media in accessing, retrieving, managing and communicating information.
MA6151	MATHEMATICS – I	CO1: Find the eigen values and eigen vectors to diagonalise and reduce a matrix to quadratic form.
		CO2: Check the converges, diverges of infinite series.
		CO3: Obtain the evaluate and envelopes of a given curves by means of radius and centre
		CO4: Calculate the maxima and minima value functions of two variables
		CO5: Find the area of plain curves and volume of solid using double and triple integrals
PH6151	ENGINEERING PHYSICS – I	CO1: Classify the Bravais lattices and different types of crystal structures and growth technique.
		CO2: Demonstrate the properties of elasticity and heat transfer through objects.
		CO3: Explain black body radiation, properties of matter waves and Schrodinger wave equations.
		CO4: Illustrate the acoustic requirements, production and application of ultrasonics
		CO5: Examine the characteristics of laser and optical fiber.

CY6151	ENGINEERING CHEMISTRY I	CO1: Classify the polymers and their utility in the industries and describe the techniques of polymerization & properties of polymers.
		CO2: Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance and equilibrium constant and its significance.
		CO3: Characterize the photophysical processes such as fluorescence and phosphorescence and various components of UV & IR spectrophotometer.
		CO4: Analyze the phase transitions of one component and two component systems and the types of alloys and their application in industries.
		CO5: Describe the synthesis, characteristics and the applications of nano materials.
GE6151	ENGINEERING GRAPHICS	CO1: Sketch the conic sections, special curves, and draw orthographic views from pictorial views and models.
		CO2: Apply the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.
		CO3: Sketch the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures
		CO4: Practice the sectional views of solids like cube, prisms, pyramids, cylinders & cones and extend its lateral surfaces
		CO5: Sketch the perspective projection of simple solids, truncated prisms, pyramids, cone and cylinders and sketch the isometric projection of simple machine parts.
GE6151	FUNDAMENTALS OF COMPUTING AND PROGRAMMING	CO1: Implement the organization of digital computer and number system, flow chart to solve basic problems.
		CO2: Develop and manage simple application in C using basic construct.
		CO3: Design and Implement to work array and string.
		CO4: Develop and Implement application related to good modular design using function and pointer.
		CO5: Develop application in C using structure and union.
GE6161	COMPUTER PRACTICES LABORATORY	CO1: Prepare data using MS-word & Excel to visualize graphs, charts in MS-Excel.
		CO2: Outline the given problem using flowchart and to program using Switch case & Control structures.
		CO3: Develop the code using decision making & looping statements.
		CO4: Apply passing parameters using Arrays & Functions.
		CO5: Use structure and Union for a given database and to bring out the importance of Unions over structure.

GE6162	ENGINEERING PRACTICES LABORATORY	CO1: Fabricate carpentry components and pipe connections including plumbing works
		CO2: Calculate the different Electrical quantities, measure the energy consumption using single phase energy meter.
		CO3: Demonstrate wiring for a simple residential house, identify the ratings of various appliances like Fluorescent tube, incandescent lamp, etc.
		CO4: Explain the basic electronic components , gates and soldering practices
		CO5: Develop soldering in a PCB, measure ripple factor of Half Wave Rectifier and Full Wave Rectifier..
GE6262	PHYSICS AND CHEMISTRY LABORATORY	CO1: Evaluate the wavelength of spectral lines using spectrometer, the wavelength of laser, particle size, acceptance angle of an optical fiber using semiconductor diode laser and the thickness of a thin
		CO2: Appraise the velocity of sound and compressibility of the liquid using ultrasonic interferometer and thermal conductivity for bad conductors using Lee's disc apparatus.
		CO3: Determine the DO content in water sample by winkler's method and molecular weight of polymer by Ostwald viscometer
		CO4: Find the strength of an acid using pH meter and conductometer.
		CO5: Estimate the amount of weak and strong acids in a mixture by conductometer.
HS6251	TECHNICAL ENGLISH- II	CO1: speak clearly, confidently, comprehensibly, and communicate with one or many people.
		CO2: Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
		CO3: Read different genres of texts adopting various reading strategies.
		CO4: Listen/view and comprehend different spoken discourses/excerpts in different accents
		CO5: Recognize, understand, and analyze the context within which language, information, and knowledge are produced, managed, organized, and disseminated.
MA6251	MATHEMATICS- II	CO1: Find solenoidal, irrotational vectors and explain the concepts of Green's, Gauss divergence , Stokes theorem to evaluate, single double and triple integrals
		CO2: Obtain the P.I. of Cauchy and Legendre Equation , explain the method of variation of parameters and solve simultaneous linear equations
		CO3: Valuate Laplace Transforms of periodic functions and solve the ODE using Inverse Laplace Transform
		CO4: Recall the properties of analytic functions for verifying C-R equations and determine Bilinear Transformation
		CO5: Expand functions of two variables as Taylor's and Laurent's series and evaluate Contour integrals using Cauchy's Integral formula

PH6251	ENGINEERING PHYSICS- II	CO1: Illustrate classical and quantum free electron theory and calculate carrier concentration in metals.
		CO2: Describe the carrier concentration in semi conductors and identify the p-type and n-type semi conductor using hall effect.
		CO3: Classify the different types of magnetic and super conducting materials.
		CO4: Explain the dielectrics, types of polarization, losses and breakdown.
		CO5: Discuss the properties, preparation and applications of metallic alloys, SMA, nano materials, NLO, Bio-materials.
CY6251	ENGINEERING CHEMISTRY – II	CO1: Explain the problems of using hard water in boilers and the methods of treatment of water for boiler use.
		CO2: Design the electrochemical cells and to identify the types of corrosion and the methods of preventing.
		CO3: Illustrate the methods of harnessing energy from non-conventional energy
		CO4: Classify various engineering materials and their importance.
		CO5: Relate the significance of solid, liquid and gaseous fuels and to calculate the calorific values of fuels and the requirement of air for combustion in furnaces.
GE6252	BASIC ELECTRICAL & ELECTRONIC ENGINEERING	CO1: Explain the working of measuring instruments and solve the basic dc and ac circuits.
		CO2: Describe the operation of dc generators, motors, single phase induction motors and transformers.
		CO3: Clarify the working of basic electronic devices such as diode, transistor and rectifier.
		CO4: Demonstrate operation of digital devices such as logic gates, counters, flip-flops analog to digital converts and digital to analog converters.
		CO5: Justify the knowledge on working of communication systems such as radio, radar, fax and television.
GE6253	ENGINEERING MECHANICS	CO1: Determine the equilibrium of a particle in space using principle of laws of mechanics.
		CO2: Compute the equilibrium of rigid bodies in two dimensions and in three dimensions.
		CO3: Calculate the principal moment of inertia of plane areas.
		CO4: Solve the problems using equation of motions and analyze impact of elastic bodies on collision.
		CO5: Solve the problems of simple system with sliding friction and calculate linear and angular acceleration of moving body in general plane motion.

GE6261	COMPUTER AIDED DRAFTING AND MODELING LABORATORY	CO1: Sketch simple figures with title block using AutoCAD software commands.
		CO2: Sketch curves like parabola, spiral and involute of square & circle and draw the orthographic projection of simple solids.
		CO3: Prepare orthographic projection of simple machine parts and draw a plan of residential building.
		CO4: Sketch simple steel truss and sectional views of simple solids.
		CO5: Prepare 2D multi view drawing from 3D model.
GE6262	PHYSICS AND CHEMISTRY LABORATORY- II	CO1: Appraise the Young's modulus of the beam by uniform and non uniform bending method, the moment of inertia and Rigidity Modulus for thin wire using Torsion Pendulum
		CO2: Use Poiseuille's method for determining the coefficient of viscosity of the liquid.
		CO3: Evaluate the refractive index of spectral lines for determining the dispersive power of a prism.
		CO4: Determine the type, amount of alkalinity , hardness in a given water sample and evaluate the amount of copper using EDTA method
		CO5: Examine the potentiometric redox titration and Conductometric precipitation titration.
MA6351	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1: Understand the basic concept of PDE solving partial diff eqn
		CO2: Solve differential Eqn Using Fourier series
		CO3: Analyze the Forier Series Techniques in solving one and two dimensional heat flow problems
		CO4: Understand the concept of Transforms and PDE
		CO5: Analyze the PDE by using Z-Transform
CE6301	ENGINEERING GEOLOGY	CO1: Explain the importance of geology in civil engineering and the theory of plate tectonics.
		CO2: Enumerate the formation of minerals and identify the properties of minerals.
		CO3: Illustrate the formation of rocks and differentiate them based on their properties.
		CO4: Examine geological maps and identify the geological structures from the maps.
		CO5: Design and construction of engineering projects such as dams, tunnels and roads.

CE6302	MECHANICS OF SOLIDS	CO1: Define the fundamental concepts of stresses and strain in mechanics of solids.
		CO2: Analysis the beams and to draw shear force and bending moment diagrams.
		CO3: Compute the slopes and deflections of determinant beams using different methods.
		CO4: Find the stresses and deflections in various shafts and helical springs.
		CO5: Analyze trusses to determine the member forces using method of joints, method of sections and estimate the principal stresses and principal planes.
CE6303	MECHANICS OF FLUIDS	CO1: Define fundamental concepts of fluid mechanics including hydro static forces on surfaces, pressure measurement, Buoyancy and floatation.
		CO2: Apply Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and inviscid fluids.
		CO3: Determine flow rates, pressure changes, minor and major head losses for viscous flows through pipes, ducts, simple networks and the effects of pumps, fans, and blowers in such systems.
		CO4: Develop the concepts of viscous boundary layers and the momentum integral and use them to determine integral thicknesses, wall shear stresses, and skin friction coefficients.
		CO5: Make use of principles of dimensional analysis and similitude to simple models using dimensionless parameters.
CE6304	SURVEYING I	CO1: Identify error sources and the procedures to minimize the error.
		CO2: Compute the included angles in compass surveying and to convert the field observations into a small-scale map using plane table surveying.
		CO3: Find the differences in elevation using different methods of levelling.
		CO4: Calculate the cross-sectional areas and volumes using contour methods.
		CO5: Determine the elevation of the objects.
GE6351	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1: CO1. Define Environment, ecosystem and biodiversity, classify types of ecosystems and outline the impacts to biodiversity.
		CO2: CO2. Define pollution, classify its types, analyze the causes and suggest control measures for pollution.
		CO3: CO3. Outline various natural resources; explain causes and impacts of destruction of resources.
		CO4: CO4. List various social issues related to land, water and energy; summarize the concerning government acts and rules to overcome these problems.
		CO5: CO5. Interpret population explosion and variation among nations, show the impacts of over population and illustrate the methods to mitigate the same.

CE6311	SURVEY PRACTICAL I	CO1: Able to apply the principles of surveying in field.
		CO2: Able to Identify data collection methods and prepare field notes
		CO3: Able to handling basic survey instruments including leveling
		CO4: Able to development of contour map of given area
		CO5: Able to posses knowledge about theodolite
CE6312	COMPUTER AIDED BUILDING DRAWING	CO1: Able to Understanding the basic commands, principles and features behind autocad.
		CO2: Able to Utilize CAD software for scaled drawing.
		CO3: Able to draft the plan, elevation and sectional views of buildings
		CO4: Able to develop and control rules satisfying orientation
		CO5: Able to understand the functional requirements as per National Building Code.
MA6459	NUMERICAL METHODS	CO1: Solve the algebraic, transcendental and system of linear equations.
		CO2: Apply the interpolation and approximations in various problems.
		CO3: Find the differentiations and integration using numerical tools.
		CO4: Determine the solution of initial value problems for ordinary differential equations.
		CO5: Determine the solution of boundary value problems in ordinary and partial differential equations.
CE6401	CONSTRUCTION MATERIALS	CO1: Compare the properties of most common building materials such as stones bricks and concrete blocks.
		CO2: Interpret the fundamentals of construction materials and mainly focusing on cement, aggregate and mortar.
		CO3: Outline the importance of fresh and hardened concrete properties in the construction industry.
		CO4: Identify different materials such as plywood, steel and paint for use in various applications in the construction field.
		CO5: Explain the typical and potential application of modern construction materials.

CE6402	STRENGTH OF MATERIALS	CO1: Define the fundamental concepts of stress energy principles.
		CO2: Analysis of indeterminate beams and use of energy method for estimating the slope and deflections of beams and trusses.
		CO3: Assess the behaviour of columns, beams and failure of materials.
		CO4: Find the principal stresses, principal strain and principal planes.
		CO5: Analyze bending of beams and curved beams.
CE6403	APPLIED HYDRAULIC ENGINEERING	CO1: Apply their knowledge of fluid mechanics in addressing problems in open channels.
		CO2: Solve problems in gradually varied flows in steady state conditions.
		CO3: Apply the energy equation and momentum equation for rapidly varied flow.
		CO4: Analyze the performance of turbines.
		CO5: Describe the characteristic performance of a centrifugal pump and working principle of reciprocating pumps.
CE6404	SURVEYING II	CO1: Explain the different surveying methods.
		CO2: Apply corrections and adjust simple triangulation networks.
		CO3: Understand total station surveying and its maintenance.
		CO4: Summarize the working principle, signal structure, components and error sources of gps.
		CO5: Understand the fundamentals of route surveying, hydrographic surveying, astronomical surveying, photogrammetry and remote sensing.
CE6405	SOIL MECHANICS	CO1: Determine Index properties, classify the soil and to select the suitable method to compact the particular soil mass.
		CO2: Calculate permeability of soil, seepage flow and seepage pressure.
		CO3: Understand the stress distribution in soil medium and to make use of Terzaghi's one dimensional consolidation theory to know the settlement characteristics of soil mass.
		CO4: Determine shear strength of cohesionless and cohesive soils and its measurement using laboratory methods.
		CO5: Identify the stability of infinite and finite slopes by applying the principles of soil mechanics.

CE6411	STRENGTH OF MATERIALS LABORATORY	CO1: Able to Understand the knowledge about properties of surfaces and solids.
		CO2: Able to calculate the impact tests on steel bar
		CO3: Able to perform flexural and torsion test to determine elastic constants
		CO4: Able to Conduct compression tests on spring, wood and concrete
		CO5: Able to calculate the deflection of springs
CE6412	HYDRAULIC ENGINEERING LABORATORY	CO1: Able to Calibrate flow measuring devices used in pipes, channels and tanks
		CO2: Able to determine frictional losses in pipes
		CO3: Able to have an idea about regulating the water supply system
		CO4: Able to develop characteristics of pumps and turbines
		CO5: Able to study about parameters in floating bodies
CE6413	SURVEY PRACTICAL II	CO1: Apply advanced surveying techniques in different fields.
		CO2: Mark the control points in field
		CO3: Locate the curve points in road and Railways
		CO4: Find the latitude and longitude of the traverse stations.
		CO5: Apply total station and EDM in distance measurement and traversing
CE6501	STRUCTURAL ANALYSIS I	CO1: Analysis indeterminate trusses and frames by energy and consistent deformation method.
		CO2: Analysis the determinate and indeterminate structures for moving load.
		CO3: Analysis the different types of arches.
		CO4: Conversant with slope deflection method.
		CO5: Conversant with moment distribution method.

CE6502	FOUNDATION ENGINEERING	CO1: Investigate the soil condition.
		CO2: Learn about types and purposes of different foundation systems and structures.
		CO3: Build the necessary theoretical background for design and construction of foundation systems.
		CO4: Select type of foundation required for the soil at a place.
		CO5: Design shallow foundation, deep foundation and retaining structures
CE6503	ENVIRONMENTAL ENGINEERING I	CO1: Explain the basic concepts of water supply system and water quality characteristics.
		CO2: Compute hydraulics of flow in pressure pipes as gravity mains.
		CO3: Plan for the primary water treatment units.
		CO4: Summarize the concepts and terminologies of advanced water treatment units.
		CO5: Analyze the water distribution networks.
CE6504	HIGHWAY ENGINEERING	CO1: Explain the highway planning with respect to classification and know about the factors influencing highway alignment
		CO2: Interpret the geometric design fundamentals of highway and focusing on horizontal and vertical curves.
		CO3: Develop the road pavement design and analysis of flexible and rigid pavement.
		CO4: Identify the different materials to be used in different layers of road and suitable construction machineries.
		CO5: Explain the possible causes of defects and appropriate road monitoring and maintenance program.
CE6505	DESIGN OF REINFORCED CONCRETE ELEMENTS	CO1: Explain the concept of elastic, ultimate load and limit state methods.
		CO2: Design of reinforced concrete beams and slabs subjected to various boundary conditions.
		CO3: Analyze the behaviour of re members subjected to shear and torsion.
		CO4: Design short circular and rectangular columns for axial, uniaxial and biaxial bending.
		CO5: Design axially and eccentrically loaded rectangular footing.

CE6506	CONSTRUCTION TECHNIQUES, EQUIPMENT AND PRACTICE	CO1: Apply the theoretical concepts of concrete technology in the real-world construction techniques.
		CO2: Summarize the construction practices starting from sub structure to super structure using different materials and innovative techniques.
		CO3: Explain the construction knowledge of sub structure element using techniques such as tunneling, piling, shoring for deep cutting and dewatering.
		CO4: Find the different construction techniques for super structure construction.
		CO5: Identify and select the construction equipment for earth work.
GE6674	COMMUNICATION AND SOFT SKILLS- LABORATORY BASED	CO1: Ability to make presentations and participate in Group Discussions.
		CO2: Ability to improve reading skills ,writing skills, speaking skills.
		CO3: Able to develop English knowledge for competitive examinations.
		CO4: Ability to face Different types of Interviews
		CO5: Able to develop multiple intelligences, intercultural communication ,creative and critical thinking.
CE6511	SOIL MECHANICS LABORATORY	CO1: Find index properties of soils
		CO2: Learn and acquire knowledge to classify soils.
		CO3: Determine insitu test for soil density
		CO4: Determine the moisture density relationship
		CO5: Determine the permeability and shear strength of soil
CE6512	SURVEY CAMP*	CO1: Select the advanced surveying technique which is best suited for a work
		CO2: Create the contour map of various field
		CO3: Find the RL of inaccessible points
		CO4: Understand the concept of astronomical surveying
		CO5: Do the total station and EDM in distance measurement and traversing

CE6601	DESIGN OF REINFORCED CONCRETE & BRICK MASONRY STRUCTURES	CO1: Design cantilever and counterfort retaining walls.
		CO2: Design rectangular and circular water tanks above and below the ground level.
		CO3: Design and draw the detailing of staircases & flat slabs and prepare bar bending schedule.
		CO4: Apply the design principles of mat foundation, box culvert, road bridges and apply the concept of yield line theory for designing various types of slabs
		CO5: Analyze and design the brick masonry walls and continuous beams subjected to various load conditions.
CE6602	STRUCTURAL ANALYSIS II	CO1: Explain the different types of indeterminacy and the use of compatibility conditions in analyzing indeterminate structures.
		CO2: Construct the element stiffness matrix and assemble the structure stiffness matrix for solving indeterminate problems.
		CO3: Apply the concept of finite element method to the structural analysis.
		CO4: Calculate the collapse loads for beams and frames using plastic analysis.
		CO5: Determine the member forces in suspension bridges and space truss.
CE6603	DESIGN OF STEEL STRUCTURES	CO1: Explain the different failure modes of bolted connections for tension or compression members.
		CO2: design the tension members.
		CO3: Analyze the most suitable section shape and size for a compression member as per provisions of current code (is 800 – 2007).
		CO4: Design the beams and plate girders.
		CO5: Design the structural systems such as roof trusses, side coverings and gantry girders.
CE6604	RAILWAYS, AIRPORTS AND HARBOUR ENGINEERING	CO1: Apply the fundamental concepts of railway planning and describe the engineering survey for track alignment.
		CO2: Explain the railway track construction, maintenance and able to find out the suitable method of tunneling.
		CO3: Describe the criteria for airport site selection and airport layout.
		CO4: Find the basic runway length required for an airport and explain marking and lighting for runway and taxiway.
		CO5: Classify the harbour and describe the harbor requirements and various coastal structures.

CE6605	ENVIRONMENTAL ENGINEERING II	CO1: Summarize the sewage characteristics and estimate sewage flow and runoff.
		CO2: Compute hydraulics of flow in sewers and identify suitable pumps and pipes.
		CO3: Plan for the primary sewage treatment units.
		CO4: Design the biological treatment units for sewages.
		CO5: Explain the sewage disposal methods and sludge management
GE6075	PROFESSIONAL ETHICS	CO1: Apply ethics, morals and human values in society.
		CO2: Explain about engineering ethics.
		CO3: Realize the responsibilities of engineers as experimenters.
		CO4: Recognize the safety, risks, risk benefit analysis and rights of an engineer.
		CO5: Discuss the importance of the global issues, moral leadership and code of conduct.
CE6611	ENVIRONMENTAL ENGINEERING LABORATORY	CO1: Perform common environmental experiments relating to water and wastewater quality.
		CO2: Characterize wastewater conduct treatability studies.
		CO3: Determine the amount of cod and cod present in the sample.
		CO4: Estimate the amount of pollutant present in the wastewater.
		CO5: Apply the laboratory results to the problem identification.
CE6612	CONCRETE AND HIGHWAY ENGINEERING LABORATORY	CO1: Explain the properties of concrete and testing procedures.
		CO2: Measure the test values and compare the test results.
		CO3: Ensure quality control while testing/sampling and acceptance criteria.
		CO4: Determine the properties of fresh and hardened concrete.
		CO5: Practice the usage of bitumen as pavement material in the highway engineering field.

CE6701	STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING	CO1: Explain the fundamental concepts of static and dynamics in structural response.
		CO2: Evaluate the equations of motion of multi degree of freedom system
		CO3: Illustrate the earthquake parameters, magnitude and intensity:
		CO4: Analyse the effect on reinforced cement concrete, steel and pre-stressed concrete structure under earthquake load.
		CO5: Design the structures for seismic loading as per code provisions is: 13920-1993.
CE6702	PRESTRESSED CONCRETE STRUCTURES	CO1: Determine the suitable method of prestressing according to the requirements and calculate the various losses of prestress.
		CO2: Design the Type I, Type II post-tensioned, pretensioned beams and shear based on IS code.
		CO3: Determine the anchorage zone stresses in posttensioned beams and design the anchorage zone reinforcement.
		CO4: Calculate the resultant stresses developed in composite beams and to analyse for the secondary moments.
		CO5: Design the various tension and compression members according to the requirements.
CE6703	WATER RESOURCES AND IRRIGATION ENGINEERING	CO1: Estimate the reservoir capacity based on the water requirement for Irrigation and Drinking.
		CO2: Identify the importance of National water policy and Economics of water resources planning.
		CO3: Calculate the water requirements of crops based on crop's base period and delta.
		CO4: Explain about the Irrigation structures such as Dams and diversion head works.
		CO5: Differentiate different types of Irrigation methods
CE6704	ESTIMATION AND QUANTITY SURVEYING	CO1: Estimate the different item of work in residential building.
		CO2: Estimate the different type of structure such as culvert, road work, sanitary and water supply works.
		CO3: Arrive the schedule of rates, tender, contract document.
		CO4: Evaluate the building with depreciation.
		CO5: Prepare a report on estimate of residential building, culvert.

CE6006	TRAFFIC ENGINEERING AND MANAGEMENT	CO1: Describe the Characteristics of Vehicles, Road users and the fundamentals of traffic flow.
		CO2: Examine about origin and destination, parking, accident studies and traffic forecasting.
		CO3: Describe the design of Traffic signals, signal coordination, grade separation and traffic signs
		CO4: Explain the road accidents, street lighting, traffic and environment hazards
		CO5: Describe the Traffic System Management and the Intelligent Transport System.
EN6501	MUNICIPAL SOLID WASTE MANAGEMENT	CO1: Know the sources and characteristics of solid waste
		CO2: Understand the merits of 3R's
		CO3: Gain knowledge on collection, segregation and transfer of MSW
		CO4: Understand the different processing methodology for MSW
		CO5: Gain knowledge on effective disposal of MSW
CE6711	COMPUTER AIDED DESIGN AND DRAFTING LABORATORY	CO1: Understand the design and detailing of retaining wall
		CO2: Know about the importance of detailing
		CO3: Learn different types of concrete structures design
		CO4: Learn the design and detailing of water tank structures
		CO5: Learn the design and detailing of girder
CE6712	DESIGN PROJECT	CO1: Design engineering solutions to complex projects using fundamental knowledge, skills and attitudes of a professional engineer.
		CO2: Identify project outcomes, constraints, deliverables, performance criteria, control needs, and resource requirements etc.
		CO3: Analyze the structure related to Civil Engineering design problems.
		CO4: Interact with team members in a professional and ethical manner, respecting differences, to ensure a collaborative project environment.
		CO5: Communicate effectively to present ideas clearly and coherently both in the written and oral forms.

MG6851	PRINCIPLES OF MANAGEMENT	CO1: Understand about management , Roles of managers, environmental Factors for an organization , Strategies for international business
		CO2: Get an idea about the planning, MBO, Decision Making and Policies making.
		CO3: Gain the knowledge about organization structure, Formal and Informal groups, Line and staff authority, Span of control, Centralization and decentralization, Staffing, Recruitment, Career
		CO4: Understand about the Creativity an Innovation, Motivation and satisfaction, Leadership theories, communication, Elements and types of Culture.
		CO5: Gain knowledge about the controlling process, types of control (Budgetary and non-budgetary control, Cost control, purchase control, Maintenance control, quality control)
CE6016	PREFABRICATED STRUCTURES	CO1: Understand the principles and concept of prefabricated structure
		CO2: Understand all components and its procedure of construction
		CO3: Follow the techniques for all types of units
		CO4: Understand connections for all joints in structural members
		CO5: Relate the concept to abnormal loads relating progressive collapse
CE6021	REPAIR AND REHABILITATION OF STRUCTURES	CO1: Gain the knowledge on quality of concrete, durability aspects, causes of deterioration
		CO2: Gain the knowledge on assessment of distressed structure
		CO3: Gain the knowledge on repairing methodology of structure
		CO4: Get to know about special concrete
		CO5: Obtain more knowledge about retrofitting
CE6811	PROJECT WORK	CO1: Understand work methodology adopted in industry
		CO2: Find solution for the difficulty during construction
		CO3: Understand the meaning of teamwork
		CO4: Give practical knowledge regarding projects
		CO5: Give the idea to finish work on time


HOD/CIVIL



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COURSE WITH COURSE OUTCOMES FOR 2017 REGULATION

COURSE CODE	COURSE NAME	COURSE OUTCOME
HIS 8151	COMMUNICATIVE ENGLISH	CO1: Manipulate effectively in informal conversations; introduce themselves and their friends and express opinions in English in day-to-day contexts.
		CO2: Dieriminate to read relevant concepts and learn to write freely.
		CO3: Anticipate conversations and short talks delivered in English in an effective way.
		CO4: Compile short essays and paragraphs of a general kind and personal letters and e mails in English in the domestic environment.
		CO5: Categorize the technical articles through reading standard journals and magazines.
MA8151	MATHEMATICS I	CO1: Apply both the limit definition and rules of differentiation to different functions. solve maxima and minima of functions
		CO2: Analyze and solve the partial differentiation for functions of several variables by various methods
		CO3: Evaluate integrals by using various techniques of integration such as substitution, partial fraction and by parts
		CO4: Apply integration to compute mutiple integrals, Area, Volume in Polar in addition to change of order
		CO5: Apply various techniques in solving differential equations.
PH 8151	ENGINEERING PHYSICS – I	CO1: Gain the knowledge on the basis of Properties of matters and Materials
		CO2: Acquire the knowledge on Waves concept and optical devices and its applications
		CO3: Attain knowledge on material, Heat exchangers series and parallel
		CO4: Enhance the knowledge on advanced physics-Quantum physics
		CO5: Apply the knowledge on the basics of crystal structures and its growth in industrial sector.

CY8151	ENGINEERING CHEMISTRY	CO1: Design water treatment techniques by analyzing the requirement of boiler feed water and its problems
		CO2: Analyse the various Industrial applications of Surface Chemistry and Catalysis by understanding the basic concepts
		CO3: Develop the applications to single and two component systems by understanding the basic concepts of phase rule and to appreciate the significance of alloys.
		CO4: Analyzing the manufacture of various types of fuels and to interpret its calorific value during combustion
		CO5: To understand the basics of crystal structures and its growth
GE 8152	ENGINEERING GRAPHICS	CO1: Sketch the conic sections, special curves, and draw orthographic views from pictorial views and models.
		CO2: Apply the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.
		CO3: Sketch the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures
		CO4: Practice the sectional views of solids like cube, prisms, pyramids, cylinders & cones and extend its lateral surfaces
		CO5: Sketch the perspective projection of simple solids, truncated prisms, pyramids, cone and cylinders and sketch the isometric projection of simple machine parts.
GE 8151	PROBLEM SOLVING AND PYTHON PROGRAMMING	CO1: Adapt, analyze and develop standard algorithm to solve problem
		CO2: Identify and use the appropriate data types for variables being critically aware of memory and complexity issues.
		CO3: Design and implement control flow and function concepts in python program for solving problems
		CO4: Implement python data structure list, tuple and dictionary for representing complex data problems
		CO5: Develop and implement python file modules and functions which react robustly to exceptional input for solving real world problems
GE 8161	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY	CO1: Develop, test, and debug simple Python programs.
		CO2: Implement Python programs with conditionals and loops.
		CO3: Develop Python programs step-wise by defining functions and calling them.
		CO4: Use Python lists, tuples, dictionaries for representing compound data.
		CO5: Read and write data from/to files in Python.

BS 8161	PHYSICS AND CHEMISTRY LABORATORY	CO1: Gain the practical knowledge on various kinds of Modulus using non uniform and torsional pendulum experiment method
		CO2: Understand the practical optical knowledge on laser & fiber optics and light experiments
		CO3: Analyse water quality parameters through volumetric analysis
		CO4: Estimate the strength and amount of acids using various instruments
		CO5: Demonstrate to calculate the amount of metallic ions by Spectrophotometer and Flame photometer.
HS 8251	TECHNICAL ENGLISH	CO1: Write area-specific texts effectively.
		CO2: Listen and comprehend lectures and talks in their area of specialization successfully.
		CO3: Speak appropriately and effectively in varied formal and informal contexts.
		CO4: Write reports and job applications appropriately.
		CO5: Improve presentation skills.
MA 8251	ENGINEERING MATHEMATICS - II	CO1: Evaluate Eigen valus and vectors, Diagonalization of matrices, positive definite matrices and similar matrices
		CO2: Analyse and to solve the problem of vector differentiation and vector integration
		CO3: Analyse and to solve the problem of analytic function, conformal mapping and bilinear transformations
		CO4: Evaluate the real integrals by applying the concept of complex integration
		CO5: Analyse and apply the knowledge of Laplace Transform in solving ODE
PH 8201	PHYSICS FOR CIVIL ENGINEERING	CO1: Understand the basic concepts of thermal performance of buildings
		CO2: Acquire knowledge on the acoustics properties of buildings
		CO3: Understand the functioning of optical materials for optoelectronics
		CO4: Understand the basics of quantum structures and their applications in spintronics and carbon electronics.
		CO5: Understand the electrical, magnetic, dielectric, optical properties of materials and properties of Nano electronic devices.

BES251	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	CO1: Illustrate the operation of AC & DC Circuits.
		CO2: Explain the operation of Electrical measuring Instruments.
		CO3: Explain the operation of Electrical Machines
		CO4: Ability to identify Semiconductor Devices.
		CO5: Apply the Digital Electronics for domestic Application
GES291	ENVIRONMENTAL SCIENCE AND ENGINEERING	CO1: Explaining the concepts of different ecosystem and biodiversity present.
		CO2: Applying the basic concepts of science and engineering for pollution abatement
		CO3: Explaining the different types of natural resources, usage and exploitation
		CO4: Implementing scientific, technological, and economic solutions to environmental problems
		CO5: Outline on the impact of population on environment
GE8292	ENGINEERING MECHANICS	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 and the effects by the laws of friction
GE8261	ENGINEERING PRACTICES LABORATORY	CO1: Fabricate Carpentry Components and pipe connections including plumbing works.
		CO2: Make Use of welding Equipments to join the structures.
		CO3: Carry out the basic machining operations.
		CO4: Make the models using sheet metal works.
		CO5: Lustrate on centrifugal pump, air conditioner, operations of smithy, foundry and fitting tools.

CE8211	COMPUTER AIDED BUILDING DRAWING	CO1: Develop plan and orientation and joinery details of paneled and glazed Doors in AUTOCAD.
		CO2: Draft the plan elevation and sectional details of load bearing structures in AUTOCAD
		CO3: Plot the plan elevation and sectional details of buildings with sloping roof in AUTOCAD
		CO4: Draft the plan elevation and sectional details of buildings with load bearing walls in AUTOCAD
		CO5: Draw the plan elevation and sectional details of industrial buildings with north light roofing in AUTOCAD
MA8353	TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS	CO1: Introduce the basic concepts of PDE for solving standard partial differential equations.
		CO2: Introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems
		CO3: Acquaint the student with Fourier series techniques in solving heat flow problems used in various situations.
		CO4: Acquaint the student with Fourier transform techniques used in wide variety of situations.
		CO5: Introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques
CE8301	STRENGTH OF MATERIALS I	CO1: Understand the concepts of stress and strain, principal stresses and principal planes.
		CO2: Determine Shear force and bending moment in beams and understand 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 and space trusses
CE8302	FLUID MECHANICS	CO1: Get a basic knowledge of fluids in static, kinematic and dynamic equilibrium.
		CO2: Understand and solve the problems related to equation of motion.
		CO3: Gain knowledge about dimensional and model analysis.
		CO4: Learn types of flow and losses of flow in pipes.
		CO5: Understand and solve the boundary layer problems.

CE8351	SURVEYING	CO1: The use of various surveying instruments and mapping
		CO2: Measuring Horizontal angle and vertical angle using different instruments
		CO3: Methods of Leveling and setting Levels with different instruments
		CO4: Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth
		CO5: Concept and principle of modern surveying.
CE8391	CONSTRUCTION MATERIALS	CO1: Compare the properties of most common and advanced building materials.
		CO2: Understand the typical and potential applications of lime, cement and aggregates
		CO3: Know the production of concrete and also the method of placing and making of concrete elements.
		CO4: Understand the applications of timbers and other materials
		CO5: Understand the importance of modern material for construction.
CE8392	ENGINEERING GEOLOGY	CO1: Understand the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies.
		CO2: Basics knowledge on properties of minerals.
		CO3: Knowledge about types of rocks, their distribution and uses.
		CO4: Understand the methods of study on geological structure.
		CO5: Understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor
CE8311	CONSTRUCTION MATERIALS LABORATORY	CO1: Conduct Quality Control tests on Fine Aggregates
		CO2: Conduct Quality Control tests on Coarse Aggregates
		CO3: Conduct Quality Control tests on fresh concrete
		CO4: Determine the strength properties of hardened concrete
		CO5: Perform Quality Control tests on Bricks, blocks and tiles

CE8361	SURVEYING LABORATORY	CO1: Gain practical knowledge on handling basic survey instruments
		CO2: Gain practical knowledge on handling Theodolite, Tacheometry
		CO3: Gain practical knowledge on handling Total Station and GPS
		CO4: Gain adequate knowledge to carryout Triangulation and Astronomical surveying
		CO5: Gain adequate knowledge on general field marking for various engineering projects and Location of site
HS8381	INTERPERSONAL SKILLS/LISTENING AND SPEAKING	CO1: Listen and respond appropriately.
		CO2: Participate in group discussions
		CO3: Make effective presentations
		CO4: Participate confidently and appropriately in conversations by formal
		CO5: Participate confidently and appropriately in conversations by informal
MA8491	NUMERICAL METHODS	CO1: Understanding the basic concepts and techniques of solving algebraic and transcendental equation
		CO2: Using the numerical techniques of interpolation and error in various interval for real life
		CO3: Apply the numerical techniques of differentiation and integration
		CO4: Apply the knowledge of various techniques and methods to solve 1st and 2nd ODE
		CO5: Analyze the partial and ODE with initial and boundary conditions by Using certain techniques with engineering APP
CE8401	CONSTRUCTION TECHNIQUES AND PRACTICES	CO1: Know the different construction techniques and structural systems
		CO2: Understand various techniques and practices on masonry construction, flooring, and roofing.
		CO3: Plan the requirements for substructure construction.
		CO4: Know the methods and techniques involved in the construction of various types of super structures
		CO5: Select, maintain and operate hand and power tools and equipment used in the building construction sites.

CE8402	STRENGTH OF MATERIALS II	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
		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, and find the stresses in curved beams.
CE 8403	APPLIED HYDRAULIC ENGINEERING	CO1: Apply their knowledge of fluid mechanics in addressing problems in open channels.
		CO2: Able to identify a effective section for flow in different cross sections.
		CO3: To solve problems in uniform, gradually and rapidly varied flows in steady state Conditions.
		CO4: Understand the principles, working and application of turbines.
		CO5: Understand the principles, working and application of pumps.
CE8404	CONCRETE TECHNOLOGY	CO1: The various requirements of cement, aggregates and water for making concrete
		CO2: The effect of admixtures on properties of concrete
		CO3: The concept and procedure of mix design as per IS method
		CO4: The properties of concrete at fresh and hardened state
		CO5: The importance and application of special concretes.
CE8491	SOIL MECHANICS	CO1: Classify the soil and assess the engineering properties, based on index properties.
		CO2: Understand the stress concepts in soils
		CO3: Understand and identify the settlement in soils.
		CO4: Determine the shear strength of soil
		CO5: Analyze both finite and infinite slopes.

CE8481	STRENGTH OF MATERIALS LABORATORY	CO1: Acquire required knowledge in the area of testing steel rod
		CO2: Acquire required knowledge in the area of testing wood
		CO3: Acquire required knowledge in the area of testing metal
		CO4: Acquire required knowledge in the area of testing components of structural elements
		CO5: Learn deflection and compression test
HS8461	ADVANCED READING AND WRITING	CO1: Write different types of essays.
		CO2: Write winning job applications.
		CO3: Read the texts critically
		CO4: Evaluate the texts critically.
		CO5: Display critical thinking in various professional contexts.
CE8461	HYDRAULIC ENGINEERING LABORATORY	CO1: Study the Characteristics of pumps
		CO2: Study the Characteristics of turbine
		CO3: Measure flow in pipes and determine frictional losses.
		CO4: Develop characteristics of pumps and turbines
		CO5: Verify the principles studied in theory by performing the experiments in lab.
CE8501	DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS	CO1: Understand the various design methodologies for the design of RC elements.
		CO2: Know 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: Design of footing by limit state method.

CE8502	STRUCTURAL ANALYSIS I	CO1: Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
		CO2: Analyze the continuous beams and rigid frames by slope deflection method.
		CO3: Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
		CO4: Analyze the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
		CO5: Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.
EN8491	WATER SUPPLY ENGINEERING	CO1: An insight into the structure of drinking water supply systems, including water transport, treatment and distribution
		CO2: The knowledge in various unit operations and processes in water treatment
		CO3: An ability to design the various functional units in water treatment
		CO4: An understanding of water quality criteria and standards, and their relation to public health
		CO5: The ability to design and evaluate water supply project alternatives on basis of chosen
CE8591	FOUNDATION ENGINEERING	CO1: Understand the site investigation, methods and sampling.
		CO2: Get knowledge on 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 and analysis for stability.
GI8014	GEOGRAPHIC INFORMATION SYSTEM	CO1: Have basic idea about the fundamentals of GIS.
		CO2: Understand the types of data models.
		CO3: Get knowledge about data input and topology.
		CO4: Gain knowledge on data quality and standards.
		CO5: Understand data management functions and data output

OA1551	ENVIRONMENT AND AGRICULTURE	CO1: Understand the role of environment in the current practice of agriculture
		CO2: Understand the concerns of sustainability, especially in the context of climate change and emerging global issues.
		CO3: Get knowledge ecological context of agriculture and its concerns
		CO4: Get knowledge of global warming and changing environment
		CO5: Understand the virtual water trade and its impacts on local environment
CE8511	SOIL MECHANICS LABORATORY	CO1: Classifying soil based on index properties of soils (coarse and fine).
		CO2: Classifying soil based on consistency limit of fine grained soils
		CO3: Interpreting the shear strength of all types of soils by conducting lab tests
		CO4: Interpreting the shear strength of all types of soils by conducting lab tests
		CO5: Understanding the engineering properties of soils by conducting field tests
CE8512	WATER AND WASTE WATER ANALYSIS LABORATORY	CO1: Quantify the pollutant concentration in water and wastewater
		CO2: Suggest the type of treatment required and amount of dosage required for the treatment
		CO3: Examine the conditions for the growth of micro-organisms
		CO4: Suggest the type of treatment required to reduce e-coli in water
		CO5: Compare the analysis of treated water among different treatments
CE8513	SURVEY CAMP	CO1: Use all surveying equipment, prepare LS &CS
		CO2: Prepare contour maps by triangulation method.
		CO3: Prepare maps and grids by Trilateration method
		CO4: Prepare contour maps by Rect angulation method
		CO5: Carryout surveying works related to land and civil engineering projects

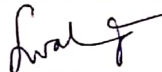
CE8601	DESIGN OF STEEL STRUCTURAL ELEMENTS	CO1: Understand the concepts of various design philosophies
		CO2: Design common bolted and welded connections for steel structures
		CO3: Design tension members and understand the effect of shear lag.
		CO4: Understand the design concept of axially loaded columns and column base connections.
		CO5: Understand specific problems related to the design of laterally restrained and unrestrained steel beams
CE8602	STRUCTURAL ANALYSIS II	CO1: Draw influence lines for statically determinate structures and calculate critical stress resultants.
		CO2: Understand 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: Understand the concept of Plastic analysis and the method of analyzing beams and rigid frames.
CE8603	IRRIGATION ENGINEERING	CO1: Have knowledge and skills on crop water requirements.
		CO2: Understand the methods and management of irrigation.
		CO3: Gain knowledge on types of Impounding structures
		CO4: Understand methods of irrigation including canal irrigation.
		CO5: Get knowledge on water management on optimization of water use.
CE8604	HIGHWAY ENGINEERING	CO1: Get knowledge on planning and aligning of highway.
		CO2: Geometric design of highways
		CO3: Design flexible and rigid pavements.
		CO4: Gain knowledge on Highway construction materials, properties, testing methods
		CO5: Understand the concept of pavement management system, evaluation of distress and maintenance of pavements.

EN8592	WASTEWATER ENGINEERING	CO1: Estimate the sewage generation and design sewer system including sewage pumping stations
		CO2: Understand the 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: Understand the standard methods for disposal of sewage.
		CO5: Gain knowledge on sludge treatment and disposal.
CE8005	AIR POLLUTION AND CONTROL ENGINEERING	CO1: Understand the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
		CO2: Ability to identify, formulate and solve air and noise pollution problems
		CO3: Ability to design stacks and particulate air pollution control devices to meet applicable standards.
		CO4: Ability to select control equipments.
		CO5: Ability to ensure quality, control and preventive measures.
CE8611	HIGHWAY ENGINEERING LABORATORY	CO1: Learn the principles and procedures of testing of aggregates
		CO2: Learn the principles and procedures of testing of bitumen
		CO3: Learn the principles and procedures of testing of bitumen mixes
		CO4: Learn the principles and procedures of testing of bitumen
		CO5: Learn the demonstration of field testing equipment
CE8612	IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING	CO1: Know about the tank components
		CO2: Learn the design principles of impounding structures
		CO3: Design and drawing of water supply and treatment plant
		CO4: Design and drawing of sewage treatment and disposal
		CO5: Design and draw various units of Municipal water treatment plant

HS8581	PROFESSIONAL COMMUNICATION	CO1: Make effective presentations
		CO2: Participate confidently in Group Discussions.
		CO3: Attend job interviews and be successful in them.
		CO4: Participate confidently in one to one interview
		CO5: Develop adequate Soft Skills required for the workplace
CE8701	ESTIMATION, COSTING AND VALUATION ENGINEERING	CO1: Estimate the quantities for buildings,
		CO2: Rate Analysis for all Building works, canals, and Roads and Cost Estimate.
		CO3: Understand types of specifications, principles for report preparation, tender notices types.
		CO4: Gain knowledge on types of contracts
		CO5: Evaluate valuation for building and land.
CE8702	RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING	CO1: Understand the methods of route alignment and design elements in Railway Planning and Constructions.
		CO2: Understand the Construction techniques and Maintenance of Track laying and Railway stations.
		CO3: Gain an insight on 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: Understand the various features in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted.
CE8703	STRUCTURAL DESIGN AND DRAWING	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 canopy girders

CE8007	TRAFFIC ENGINEERING AND MANAGEMENT	CO1: Analyse traffic problems
		CO2: plan for traffic systems various uses
		CO3: learn the traffic safety and environment
		CO4: Design Channels, Intersections, signals and parking arrangements
		CO5: Develop Traffic management Systems
OML751	TESTING OF MATERIALS	CO1: Identify suitable testing technique to inspect industrial component
		CO2: learn the non destructive test for various materials
		CO3: Ability to use the different technique and know its applications and limitations
		CO4: Understand the thermal testing of various materials
		CO5: Understand the chemical testing of various materials
CE8711	CREATIVE AND INNOVATIVE PROJECT	CO1: Design engineering solutions to complex projects using fundamental knowledge, skills and attitudes of a professional engineer.
		CO2: Identify project outcomes, constraints, deliverables, performance criteria, control needs, and resource requirements etc.
		CO3: Analyze the structure related to Civil Engineering design problems.
		CO4: Interact with team members in a professional and ethical manner, respecting differences, to ensure a collaborative project environment.
		CO5: Communicate effectively to present ideas clearly and coherently both in the written and oral forms.
GE8076	PROFESSIONAL ETHICS IN ENGINEERING	CO1: Awareness on Engineering Ethics and Human Values
		CO2: Apply ethics in society
		CO3: Instill Moral and Social Values and Loyalty
		CO4: Discuss the ethical issues related to engineering
		CO5: Realize the responsibilities and rights in the society.

CE8022	PREFABRICATED STRUCTURES	CO1: knowledge about design principles, layout of factory and stages of loading in precast construction.
		CO2: Acquire knowledge about panel systems, slabs, connections used in precast construction and they will be in a position to design the elements.
		CO3: Acquire knowledge about types of floor systems, stairs and roofs used in precast construction.
		CO4: Acquire knowledge about types of walls used in precast construction, sealants, design of joints.
		CO5: Acquire knowledge about components in industrial building.
CE8811	PROJECT WORK	CO1: Understand work methodology adopted in industry
		CO2: Find solution for the difficulty during construction
		CO3: Understand the meaning of teamwork
		CO4: Give practical knowledge regarding projects
		CO5: Give the idea to finish work on time


HOD/CIVIL