REGULATIONS – 2017 - PEO/PO/CO

CHOICE BASED CREDIT SYSTEM

PROGRAMME EDUCATIONAL OBJECTIVES (PEO):

PEO 1) To prepare students for successful careers in Civil Engineering field that meets the needs of Indian and multinational companies.

PEO 2) To develop the confidence and ability among students to synthesize data and technical concepts and thereby apply it in real world problems.

PEO 3) To develop students to use modern techniques, skill and mathematical engineering tools for solving problems in Civil Engineering.

PEO 4) To provide students with a sound foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyse engineering problems and to prepare them for graduate studies.

PEO 5) To promote students to work collaboratively on multi-disciplinary projects and make them engage in life-long learning process throughout their professional life.

PROGRAMME OUTCOMES (PO):

PO1) Graduates will demonstrate knowledge of mathematics, science and engineering.

PO2) Graduates will demonstrate an ability to identify, formulate and solve engineering problems.

PO3) Graduate will demonstrate an ability to design and conduct experiments, analyze and interpret data.

PO4) Graduates will demonstrate an ability to design a system, component or process as per needs and specifications.

PO5) Graduates will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.

PO6) Graduate will demonstrate skills to use modern engineering tools, software and equipment to analyze problems.

PO7) Graduates will demonstrate knowledge of professional and ethical responsibilities.

PO8) Graduate will be able to communicate effectively in both verbal and written form.

PO9) Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.

PO10) Graduate will develop confidence for self education and ability for life-long learning.

COURSE OUTCOMES 2017

SEMESTER I

HS8151 COMMUNICATIVE ENGLISH

HS8151.1 Read articles of a general kind in magazines and newspapers.

HS8151.2 Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.

HS8151.3 Comprehend conversations and short talks delivered in English

HS8151.4 Write short essays of a general kind and personal letters and emails in English.

MA8151 ENGINEERING MATHEMATICS – I

MA8151.1 Use both the limit definition and rules of differentiation to differentiate functions.

MA8151.2 Apply differentiation to solve maxima and minima problems.

MA8151.3 Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.

MA8151.4 Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.

MA8151.5 Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.

MA8151.6 Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.

MA8151.7 Apply various techniques in solving differential equations.

PH8151 ENGINEERING PHYSICS

PH8151.1 The students will gain knowledge on the basics of properties of matter and its applications,

PH8151.2 The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,

PH8151.3 The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,

PH8151.4 The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes, and

PH8151.5 The students will understand the basics of crystals, their structures and different crystal growth techniques.

CY8151 ENGINEERING CHEMISTRY

CY8151.1 The knowledge gained on Water Treatment techniques to facilitate better understanding of Ion exchange process, Zeolite process, Desalination and Reverse Osmosis.

CY8151.2	The knowledge gained on Surface Chemistry to facilitate better understanding on Adsorption of gases and Catalysis.
CY8151.3	The knowledge gained on Engineering Materials to facilitate better understanding on Alloys and Heat treatment process.
CY8151.4	The knowledge gained on Fuels to facilitate better understanding on its types and Combustion process.
CY8151.5	The knowledge gained on Energy Sources and Storage devices to facilitate better understanding of its processes and applications.

GE8151	**PROBLEM SOLVING AND PYTHON PROGRAMMING**
GE8151.1	Develop algorithmic solutions to simple computational problems.
GE8151.2	Read, write, execute by hand simple Python programs.
GE8151.3	Structure simple Python programs for solving problems.
GE8151.4	Decompose a Python program into functions.
GE8151.5	Represent compound data using Python lists, tuples, dictionaries.
GE8151.6	Read and write data from/to files in Python Programs.

GE8152	**ENGINEERING GRAPHICS**
GE8152.1	Familiarize with the fundamentals and standards of Engineering graphics.
GE8152.2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
GE8152.3	Project orthographic projections of lines and plane surfaces.
GE8152.4	Draw projections and solids and development of surfaces.
GE8152.5	Visualize and to project isometric and perspective sections of simple solids.

GE8161	**PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY**
GE8161.1	Write, test, and debug simple Python programs.
GE8161.2	Implement Python programs with conditionals and loops.
GE8161.3	Develop Python programs step-wise by defining functions and calling them.
GE8161.4	Use Python lists, tuples, dictionaries for representing compound data.
GE8161.5	Read and write data from/to files in Python.

BS8161	**PHYSICS AND CHEMISTRY LABORATORY**
BS8161.1	Apply the principles of elasticity.
BS8161.2	The knowledge on optics.
BS8161.3	Understood the thermal properties for engineering applications.
BS8161.4	Understood the basic principles of laser.
BS8161.5	Determine the Thermal conductivity of a bad conductor.
BS8161.6	Estimate the Iron content and molecular weight.
BS8161.7	Knowledge on the quantitative chemical analysis of water quality.

SEMESTER II

HS8251 TECHNICAL ENGLISH

HS8251.1 Read technical texts and write area- specific texts effortlessly.

HS8251.2 Listen and comprehend lectures and talks in their area of specialisation successfully.

HS8251.3 Speak appropriately and effectively in varied formal and informal contexts.

HS8251.4 Write reports and winning job applications.

MA8251 ENGINEERING MATHEMATICS – II

MA8251.1 Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.

MA8251.2 Gradient, divergence and curl of a vector point function and related identities.

MA8251.3 Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.

MA8251.4 Analytic functions, conformal mapping and complex integration.

MA8251.5 Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.

PH8201 PHYSICS FOR CIVIL ENGINEERING

PH8201.1 The students will have knowledge on the thermal performance of buildings

PH8201.2 The students will acquire knowledge on the acoustic properties of buildings

PH8201.3 The students will get knowledge on various lighting designs for buildings

PH8201.4 The students will gain knowledge on the properties and performance of engineering materials

PH8201.5 The students will understand the hazards of buildings.

GE8291 ENVIRONMENTAL SCIENCE AND ENGINEERING

GE8291.1 Public awareness of environmental is at infant stage.

GE8291.2 Ignorance and incomplete knowledge has lead to misconceptions

GE8291.3 Development and improvement in std. of living has lead to serious environmental disasters

GE8292 ENGINEERING MECHANICS

GE8292.1 Illustrate the vectorial and scalar representation of forces and moments
GE8292.2 Analyse the rigid body in equilibrium
GE8292.3 Evaluate the properties of surfaces and solids
GE8292.4 Calculate dynamic forces exerted in rigid body
GE8292.5 Determine the friction and the effects by the laws of friction

GE8261 ENGINEERING PRACTICES LABORATORY

GE8261.1 Fabricate carpentry components and pipe connections including plumbing works.
GE8261.2 Use welding equipments to join the structures.
GE8261.3 Carry out the basic machining operations
GE8261.4 Make the models using sheet metal works
GE8261.5 Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
GE8261.6 Carry out basic home electrical works and appliances
GE8261.7 Measure the electrical quantities
GE8261.8 Elaborate on the components, gates, soldering practices.

CE8211 COMPUTER AIDED BUILDING DRAWING

CE8211.1 The students will be able to draft the plan, elevation and sectional views of the buildings, industrial structures, and framed buildings using computer software.

SEMESTER III

MA8353 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

MA8353.1 Understand how to solve the given standard partial differential equations.
MA8353.2 Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
MA8353.3 Appreciate the physical significance of Fourier series techniques in solving one and twodimensional heat flow problems and one dimensional wave equations.
MA8353.4 Understand the mathematical principles on transforms and partial differential equations
would provide them the ability to formulate and solve some of the physical problems of

engineering.
MA8353.5 Use the effective mathematical tools for the solutions of partial differential equations byusing Z transform techniques for discrete time systems.

CE8301 STRENGTH OF MATERIALS I

CE8301.1 Determine Shear force and bending moment in beams and understand concept of theory of simple bending.
CE8301.2 Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
CE8301.3 Apply basic equation of torsion in design of circular shafts and helical springs, .
CE8301.4 Analyze the pin jointed plane and space trusses

CE8302 FLUID MECHANICS

CE8302.1 Get a basic knowledge of fluids in static, kinematic and dynamic equilibrium.
CE8302.2 Understand and solve the problems related to equation of motion.
CE8302.3 Gain knowledge about dimensional and model analysis.
CE8302.4 Learn types of flow and losses of flow in pipes.
CE8302.5 Understand and solve the boundary layer problems.

CE8351 SURVEYING

CE8351.1 The use of various surveying instruments and mapping
CE8351.2 Measuring Horizontal angle and vertical angle using different instruments
CE8351.3 Methods of Leveling and setting Levels with different instruments
CE8351.4 Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth
CE8351.5 Concept and principle of modern surveying.

CE8391 CONSTRUCTION MATERIALS

CE8391.1 Compare the properties of most common and advanced building materials.
CE8391.2 Understand the typical and potential applications of lime, cement and aggregates
CE8391.3 Know the production of concrete and also the method of placing and making of concrete elements.
CE8391.4 Understand the applications of timbers and other materials
CE8391.5 Understand the importance of modern material for construction

CE8392 ENGINEERING GEOLOGY

CE8392.1 To understand the importance of geological knowledge such as earthquake, volcanism and the action of various geological agencies.
CE8392.2 Will get basics knowledge on properties of minerals.
CE8392.3 Gain knowledge about types of rocks, their distribution and uses.
CE8392.4 Will understand the methods of study on geological structure.
CE8392.5 Will understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbour

CE8311 CONSTRUCTION MATERIALS LABORATORY

CE8311.1 The students will have the required knowledge in the area of testing of construction materials and components of construction elements experimentally.

CE8361 SURVEYING LABORATORY

CE8361.1 Practical knowledge on handling basic survey instruments including Theodolite, Tacheometry, Total Station and GPS
CE8361.2 Have adequate knowledge to carryout Triangulation and Astronomical surveying including general field marking for various engineering projects and Location of site etc.

HS8381 INTERPERSONAL SKILLS/LISTENING AND SPEAKING

HS8381.1 Listen and respond appropriately.
HS8381.2 Participate in group discussions
HS8381.3 Make effective presentations
HS8381.4 Participate confidently and appropriately in conversations both formal and informal

SEMESTER IV

MA8491 NUMERICAL METHODS

MA8491.1 Understand the basic concepts and techniques of solving algebraic and transcendental equations.
MA8491.2 Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.
MA8491.3 Apply the numerical techniques of differentiation and integration for engineering problems.
MA8491.4 Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
MA8491.5 Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

CE8401 CONSTRUCTION TECHNIQUES AND PRACTICES

CE8401.1 Know the different construction techniques and structural systems
CE8401.2 Understand various techniques and practices on masonry construction, flooring, and roofing.
CE8401.3 Plan the requirements for substructure construction.
CE8401.4 Know the methods and techniques involved in the construction of various types of super structures
CE8401.5 Select, maintain and operate hand and power tools and equipment used in the building construction sites.

CE8402 STRENGTH OF MATERIALS II

CE8402.1 Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.
CE8402.2 Analyze propped cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements.
CE8402 .3 find the load carrying capacity of columns and stresses induced in columns and cylinders
CE8402 .4 Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure
CE8402.5 Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and find the stresses in curved beams.

CE8403 APPLIED HYDRAULIC ENGINEERING

CE8403.1 Apply their knowledge of fluid mechanics in addressing problems in open channels.
CE8403.2 Able to identify a effective section for flow in different cross sections.
CE8403.3 To solve problems in uniform, gradually and rapidly varied flows in steady state conditions.
CE8403.4 Understand the principles, working and application of turbines.
CE8403.5 Understand the principles, working and application of pumps.

CE8404 CONCRETE TECHNOLOGY

CE8404.1 The various requirements of cement, aggregates and water for making concrete
CE8404.2 The effect of admixtures on properties of concrete
CE8404.3 The concept and procedure of mix design as per IS method
CE8404.4 The properties of concrete at fresh and hardened state
CE8404.5 The importance and application of special concretes.

CE8491 SOIL MECHANICS

CE8491.1 Classify the soil and assess the engineering properties, based on index properties.
CE8491.2 Understand the stress concepts in soils
CE8491.3 Understand and identify the settlement in soils.

CE8491.4 Determine the shear strength of soil
CE8491.5 Analyze both finite and infinite slopes.

CE8481 STRENGTH OF MATERIALS LABORATORY

CE8481.1 The students will have the required knowledge in the area of testing of materials and components of structural elements experimentally.

CE8461 HYDRAULIC ENGINEERING LABORATORY

CE8461.1 The students will be able to measure flow in pipes and determine frictional losses.
CE8461.2 The students will be able to develop characteristics of pumps and turbines.

HS8461 ADVANCED READING AND WRITING

HS8461.1 Write different types of essays.
HS8461.2 Write winning job applications.
HS8461.3 Read and evaluate texts critically.
HS8461.4 Display critical thinking in various professional contexts.

SEMESTER V

CE8501 DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS

Understand the various design methodologies for the design of RC elements.
CE8501.1 Know the analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion.
CE8501.2 design the various types of slabs and staircase by limit state method.
CE8501.3 Design columns for axial, uniaxial and biaxial eccentric loadings.
CE8501.4 Design of footing by limit state method.

CE8502 STRUCTURAL ANALYSIS I

Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
CE8502.1 Analyse the continuous beams and rigid frames by slope defection method.
CE8502.2 Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
CE8502.3 Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
CE8502.4 Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.

EN8491 WATER SUPPLY ENGINEERING

an insight into the structure of drinking water supply systems, including water transport, treatment and distribution
EN8491.1 the knowledge in various unit operations and processes in water treatment
EN8491.2 an ability to design the various functional units in water treatment
EN8491.3 an understanding of water quality criteria and standards, and their relation to public health
EN8491.4 the ability to design and evaluate water supply project alternatives on basis of chosen criteria.

CE8591 FOUNDATION ENGINEERING

Understand the site investigation, methods and sampling.
CE8591.1 Get knowledge on bearing capacity and testing methods.
CE8591.2 Design shallow footings.
CE8591.3 Determine the load carrying capacity, settlement of pile foundation.
CE8591.4 Determine the earth pressure on retaining walls and analysis for stability.

CE8511 SOIL MECHANICS LABORATORY

CE8511.1 Students are able to conduct tests to determine both the index and engineering properties of soils and to characterize the soil based on their properties.

CE8512 WATER AND WASTE WATER ANALYSIS LABORATORY

Quantify the pollutant concentration in water and wastewater
CE8512.1 Suggest the type of treatment required and amount of dosage required for the treatment
CE8512.2 Examine the conditions for the growth of micro-organisms

CE8513 SURVEY CAMP

CE8513.1 Students may be given survey exercises in other area also based on site condition to give good exposure on survey.

SEMESTER VI

CE8601 DESIGN OF STEEL STRUCTURAL ELEMENTS

Understand the concepts of various design philosophies
CE8601.1 Design common bolted and welded connections for steel structures
CE8601.2 Design tension members and understand the effect of shear lag.
CE8601.3 Understand the design concept of axially loaded columns and column base connections.
CE8601.4 Understand specific problems related to the design of laterally restrained and unrestrained steel beams.

CE8602 STRUCTURAL ANALYSIS I

CE8602.1 Draw influence lines for statically determinate structures and calculate critical stress resultants.
CE8602.2 Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams.
CE8602.3 Analyse of three hinged, two hinged and fixed arches.
CE8602.4 Analyse the suspension bridges with stiffening girders
CE8602.5 Understand the concept of Plastic analysis and the method of analyzing beams and rigid frames.

CE8603 IRRIGATION ENGINEERING

CE8603.1 Have knowledge and skills on crop water requirements.
CE8603.2 Understand the methods and management of irrigation.
CE8603.3 Gain knowledge on types of Impounding structures
CE8603.4 Understand methods of irrigation including canal irrigation.
CE8603.5 Get knowledge on water management on optimization of water use.

CE8604 HIGHWAY ENGINEERING

CE8604.1 Get knowledge on planning and aligning of highway.
CE8604.2 Geometric design of highways
CE8604.3 Design flexible and rigid pavements.
CE8604.4 Gain knowledge on Highway construction materials, properties, testing methods
CE8604.5 Understand the concept of pavement management system, evaluation of distress and maintenance of pavements.

EN8592 WASTEWATER ENGINEERING

EN8592.1 An ability to estimate sewage generation and design sewer system including sewage pumping stations
EN8592.2 The required understanding on the characteristics and composition of sewage, selfpurification of streams
EN8592.3 An ability to perform basic design of the unit operations and processes that are used in sewage treatment
EN8592.4 Understand the standard methods for disposal of sewage.
EN8592.5 Gain knowledge on sludge treatment and disposal.

CE8611 HIGHWAY ENGINEERING LABORATORY

CE8611.1 Student knows the techniques to characterize various pavement materials through relevant tests.

CE8612 IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING

CE8612.2 The students after completing this course will be able to design and draw various units of Municipal water treatment plants and sewage treatment plants.

HS8581 PROFESSIONAL COMMUNICATION

HS8581.1 Make effective presentations
HS8581.2 Participate confidently in Group Discussions.
HS8581.3 Attend job interviews and be successful in them.
HS8581.4 Develop adequate Soft Skills required for the workplace

SEMESTER VII

CE8701 ESTIMATION, COSTING AND VALUATION ENGINEERING

CE8701.1 Estimate the quantities for buildings,
CE8701.2 Rate Analysis for all Building works, canals, and Roads and Cost Estimate.
CE8701.3 Understand types of specifications, principles for report preparation, tender notices types.
CE8701.4 Gain knowledge on types of contracts
CE8701.5 Evaluate valuation for building and land.

CE8702 RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING

CE8702.1 Understand the methods of route alignment and design elements in Railway Planning and Constructions.
CE8702.2 Understand the Construction techniques and Maintenance of Track laying and Railway stations.
CE8702.3 Gain an insight on the planning and site selection of Airport Planning and design.
CE8702.4 Analyze and design the elements for orientation of runways and passenger facility systems.
CE8702.5 Understand the various features in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted.

CE8703 STRUCTURAL DESIGN AND DRAWING

CE8703.1 Design and draw reinforced concrete Cantilever and Counterfort Retaining Walls
CE8703.2 Design and draw flat slab as per code provisions

CE8703.3 Design and draw reinforced concrete and steel bridges
CE8703.4 Design and draw reinforced concrete and steel water tanks
CE8703.5 Design and detail the various steel trusses and cantry girders

CE8711 CREATIVE AND INNOVATIVE PROJECT

CE8711.1 To come up with designs, fabrication or algorithms and programs expressing their ideas in a novel way.

CE8712 INDUSTRIAL TRAINING

CE8712.1 The intricacies of implementation textbook knowledge into practice
CE8712.2 The concepts of developments and implementation of new techniques

CE8811 PROJECT WORK

CE8811 .1 On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

GI8012 DIGITAL CADASTRE

GI8012.1 Gain knowledge about cadastre survey.
GI8012.2 Understand the methods of cadastral survey.
GI8012.3 Get the knowledge about photogrammetric methods.
GI8012.4 Understand Land Record System and computational procedure for modernization of the same.
GI8012.5 The students will be in position to understand the Government procedure in Land Record Management.

GI8013 ADVANCED SURVEYING

GI8013.1 know the astronomical surveying
GI8013.2 do the photogrammetric surveying and interpretation
GI8013.3solve the field problems with Total station
GI8013.4 know the GPS surveying and the data processing
GI8013.5 understand the route surveys and tunnel alignments

GI8014 GEOGRAPHIC INFORMATION SYSTEM

GI8014.1 Have basic idea about the fundamentals of GIS.
GI8014.2 Understand the types of data models.
GI8014.3 Get knowledge about data input and topology.
GI8014.4 Gain knowledge on data quality and standards.
GI8014.5 Understand data management functions and data output

GI8015 GEOINFORMATICS APPLICATIONS FOR CIVIL ENGINEERS

GI8015.1 Get knowledge about the land resource management.
GI8015.2 Study structural deformation and movement.
GI8015.3 Model soil characteristics, soil degradation assessment and management.

GI8015.4 Monitor urban growth and management of transport infrastructure.
GI8015.5 Model catchments and management of water resources.

GI8491 TOTAL STATION AND GPS SURVEYING

GI8491.1 Working principles of total station and GPS instruments
GI8491.2 Propagation of EMR through atmosphere and corrections for its effects
GI8491.3 The functioning various types total station and GPS equipments and their applications
GI8491.4 Various techniques available for surveying and mapping with total station and GPS.

GE8071 DISASTER MANAGEMENT

GE8071.1 Differentiate the types of disasters, causes and their impact on environment and society
GE8071.2 Assess vulnerability and various methods of risk reduction measures as well as mitigation.
GE8071.3 Draw the hazard and vulnerability profile of India, Scenarious in the Indian context,
GE8071.4 Disaster damage assessment and management.

GE8074 HUMAN RIGHTS

GE8074.1 Engineering students will acquire the basic knowledge of human rights.

CE8001 GROUND IMPROVEMENT TECHNIQUES

CE8001.1 Gain knowledge on methods and selection of ground improvement techniques.
CE8001.2 Understand dewatering techniques and design for simple cases.
CE8001.3 Get knowledge on insitu treatment of cohesionless and cohesive soils.
CE8001.4 Understand the concept of earth renforcement and design of reinforced earth.
CE8001.5 Get to know types of grouts and grouting technique.

CE8002 INTRODUCTION TO SOIL DYNAMICS AND MACHINE FOUNDATIONS

CE8002.1 Understand the theory and measurement of vibration.
CE8002.2 Understand the concept of wave propagation in infinite medium and due to machine foundation.
CE8002.3 Get knowledge on dynamic properties of soils and laboratory and field testing.
CE8002.4 Design of foundation for different types of machines
CE8002.5 Understand liquefaction, motion isolation and vibration control.

CE8003 ROCK ENGINEERING

CE8003.1 Classify the rocks, study the index properties of rock systems.
CE8003.2 Understand the modes of rock failure, stares-strain characteristics, failure criteria.
CE8003.3 Estimate the stresses in rocks.
CE8003.4 Apply rock mechanics in engineering.
CE8003.5 Get knowledge on rock stabilization.

CE8004 URBAN PLANNING AND DEVELOPMENT

CE8004.1 Describe basic issues in urban planning
CE8004.2 Formulate plans for urban and rural development and
CE8004.3 Plan and analyse socio economic aspects of urban and rural planning
CE8004.4 Design of urban development projects.
CE8004.5 Manage urban development projects.

CE8005 AIR POLLUTION AND CONTROL ENGINEERING

CE8005.1 an understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
CE8005.2 ability to identify, formulate and solve air and noise pollution problems
CE8005.3 ability to design stacks and particulate air pollution control devices to meet applicable standards.
CE8005.4 Ability to select control equipments.
CE8005.5 Ability to ensure quality, control and preventive measures.

GE8075 INTELLECTUAL PROPERTY RIGHTS

GE8075.1 Ability to manage Intellectual Property portfolio to enhance the value of the firm

CE8006 PAVEMENT ENGINEERING

CE8006.1 Get knowledge about types of rigid and flexible pavements.
CE8006.2 Able to design of rigid pavements.
CE8006.3 Able to design of flexible pavements.
CE8006.4 Determine the causes of distress in rigid and flexible pavements.
CE8006.5 Understand stailisation of pavements, testing and field control.

CE8007 TRAFFIC ENGINEERING AND MANAGEMENT

CE8007.1 Analyse traffic problems and plan for traffic systems various uses
CE8007.2 Design Channels, Intersections, signals and parking arrangements
CE8007.3 Develop Traffic management Systems

CE8008 TRANSPORT AND ENVIRONMENT

CE8008.1 Understood the impact of Transportation projects on the environment.
CE8008.2 Get knowledge on methods of impact analysis and their applications.
CE8008.3 Understand environmental Laws on Transportation Projects and the mitigative measures adopted in the planning stage.
CE8008.4 Predict and assess the impact of transportation projects.

CE8009 INDUSTRIAL STRUCTURES

CE8009.1C Know the requirements of various industries and get an idea about the materials used and planning of various industrial components
CE8009.2 Understand the functional requirements for industrial structures.
CE8009.3 Design special steel structures like bunkers, silos, crane girders, chimneys and preengineered buildings.
CE8009.4 Design special RC structures like corbels, silos, bunkers, chimneys, plates and shells.
CE8009.5 Understand the principles of prefabrication and prestressing

CE8010 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

CE8010.1 carry out scoping and screening of developmental projects for environmental and social assessments
CE8010.2 explain different methodologies for environmental impact prediction and assessment
CE8010.3 plan environmental impact assessments and environmental management plans
CE8010.4 evaluate environmental impact assessment reports

CE8011 DESIGN OF PRESTRESSED CONCRETE STRUCTURES

CE8011.1 Understand the behaviour of prestressed concrete members and able to analyze the prestressed concrete beams.
CE8011.2 Design the prestressed concrete members for flexure and shear as per the relevant design code (IS 1343).
CE8011.3 Analyze for deflection of prestressed concrete members and design the anchorage zone.
CE8011.4 Analyze and design of composite beams and continuous beams.
CE8011.5 Design of prestressed concrete structures - sleepers, Tanks, pipes and poles.

CE8012 CONSTRUCTION PLANNING AND SCHEDULING

CE8012.1 Understand basic concepts of construction planing.
CE8012.2 Schedule the construction activities.
CE8012.3 Forecast and control the cost in a construction.
CE8012.4 Understand the quality control and safety during construction.
CE8012.5 Organize information in Centralized database Management systems.

EN8591 MUNICIPAL SOLID WASTE MANAGEMENT

EN8591.1 understanding of the nature and characteristics of municipal solid wastes and the regulatory requirements regarding municipal solid waste management.
EN8591.2 Reduction, reuse and recycling of waste.

EN8591.3 ability to plan and design systems for storage, collection, transport, processing and disposal of municipal solid waste.
EN8591.4 knowledge on the issues on solid waste management from an integrated and holistic perspective, as well as in the local and international context.
EN8591.5 Design and operation of sanitary landfill.

GE8077 TOTAL QUALITY MANAGEMENT

GE8077.1 The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

GE8072 FOUNDATION SKILLS IN INTEGRATED PRODUCT DEVELOPMENT

GE8072.1 Define, formulate and analyze a problem
GE8072.2 Solve specific problems independently or as part of a team
GE8072.3 Gain knowledge of the Innovation & Product Development process in the Business Context
GE8072.4 Work independently as well as in teams
GE8072.5 Manage a project from start to finish

CE8013 COASTAL ENGINEERING

CE8013.1 Understand coastal engineering aspects of harbors methods to improve navigation
CE8013.2 Understand the wave properties and analysis of wave.
CE8013.3 Understand the concepts of sediment transport.
CE8013.4 Design of shore defense structures.
CE8013.5 Gain knowledge in modeling in coastal engineering.

CE8014 PARTICIPATORY WATER RESOURCES MANAGEMENT

CE8014.1 Gain knowledge on various processes involved in participatory water resource management.
CE8014.2 Understand famers participation in water resources management.
CE8014.3 Aware of the issues related to water conservation and watershed Development
CE8014.4 Get knowledge in participatory water conservation
CE8014.5 Understand concept, principle , approach of watershed management.

CE8015 INTEGRATED WATER RESOURCES MANAGEMENT

CE8015.1 Understand objectives, principles and evolution of integrated water resources management.
CE8015.2 Have an idea of contextualizing IWRM
CE8015.3 Gain knowledge in emerging issues in water management, flood, drought, pollution and poverty.
CE8015.4 Understand the water resources development in India and wastewater reuse.
CE8015.5 Gain knowledge on integrated development of water management.

CE8016 GROUNDWATER ENGINEERING

CE8016.1 Understand aquifer properties and its dynamics
CE8016.2 Get an exposure towards well design and practical problems
CE8016.3 Develop a model for groundwater management.

CE8016.4 Students will be able to understand the importance of artificial recharge and groundwater quality concepts
CE8016.5 Gain knowledge on conservation of groundwater.

CE8017 WATER RESOURCES SYSTEMS ENGINEERING

CE8017.1 Exposed to the economic aspects and analysis of water resources systems by which they will get an idea of comprehensive and integrated planning of a water resources project.
CE8017.2 Understanding the concept of linear programming and apply in water resource system.
CE8017.3 Understanding the concept of dynamic programming and apply in water resource system.
CE8017.4 Develops simulation models.
CE8017.5 Ddeveloping skills in solving problems in operations research through LP, DP and Simulation techniques.

CE8018 GEO-ENVIRONMENTAL ENGINEERING

CE8018.1 Assess the contamination in the soil
CE8018.2 Understand the current practice of waste disposal
CE8018.3 To prepare the suitable disposal system for particular waste.
CE8018.4 Stabilize the waste and utilization of solid waste for soil improvement.
CE8018.5 Select suitable remediation methods based on contamination.

CE8091 HYDROLOGY AND WATER RESOURCES ENGINEERING

CE8091.1 an understanding of the key drivers on water resources, hydrological processes and their integrated behaviour in catchments,
CE8091.2 ability to construct and apply a range of hydrological models to surface water and groundwater problems including Hydrograph, Flood/Drought management, artificial recharge
CE8091.3 ability to conduct Spatial analysis of rainfall data and design water storage reservoirs
CE8091.4 Understand the concept and methods of ground water management.

GE8076 PROFESSIONAL ETHICS IN ENGINEERING

GE8076.1 Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

CE8019 COMPUTER AIDED DESIGN OF STRUCTURES

CE8019.1 Understand the concepts of Computer-Aided Design, Software requirements and Hardware components in CAD system.
CE8019.2 Acquire the knowledge in Computer Graphics and Computer aided drafting using Auto CAD software.
CE8019.3 Understand the fundamentals of finite element analysis and be able use software for modeling, analysis and design of structures.

CE8019.4 Understand the concepts of Optimization techniques and its practical applications to structural engineering.
CE8019.5 Acquire the knowledge in Artificial Intelligence and Knowledge based expert systems.

CE8020 MAINTENANCE, REPAIR AND REHABILITATION OF STRUCTURES

CE8020.1 The importance of maintenance and assessment method of distressed structures.
CE8020.2 The strength and durability properties ,their effects due to climate and temperature.
CE8020.3 Recent development in concrete
CE8020.4 The techniques for repair rand protection methods • repair, rehabilitation and retrofitting of structures and demolition methods.

CE8021 STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

CE8021.1 Student will develop knowledge in the simulation and mathematical model development.
CE8021.2 Students will be trained to identify, formulate and solve complicated problem.
CE8021.3 Students will be able to understand the role of natural calamity in the damage of structures.
CE8021.4 Students will be able to develop the skill to analyse data and to apply the same in the practical problems.
CE8021.5 Students will be able to apply the developed methodologies for the safe and stable design of structures.

CE8022 PREFABRICATED STRUCTURES

CE8022.1 The student will have good knowledge about design principles, layout of factory and stages of loading in precast construction.
CE8022.2 Acquire knowledge about panel systems, slabs, connections used in precast construction and they will be in a position to design the elements.
CE8022.3 Acquire knowledge about types of floor systems, stairs and roofs used in precast construction.
CE8022.4 Acquire knowledge about types of walls used in precast construction, sealants, design of joints.
CE8022.5 Acquire knowledge about components in industrial building.

CE8023 BRIDGE ENGINEERING

CE8023.1 Identify loads on bridges and selection of type of bridge for the site condition
CE8023.2 Analyze the super structure by various methods.
CE8023.3 Design the trussed bridge and plate girder bridges
CE8023.4 Design reinforced concrete slab and T beam bridges and prestressed concrete bridges
CE8023.5 Decide the appropriate sub structural systems , bearings and expansion joints for the bridges.

GE8073 FUNDAMENTALS OF NANOSCIENCE

GE8073.1 Will familiarize about the science of nano materials
GE8073.2 Will demonstrate the preparation of nanomaterials
GE8073.3 Will develop knowledge in characteristic nanomaterial