Course Outcomes: Students should be able to

First Year (FE) Civil Engineering (Curriculum 2015 Pattern)

Semester-I

Subject	Engineering Mathematics -I
Subject Code	CE 101 (107001)
Course Outcome (COs)	
CE 101.1	Understand the concepts of matrics that serve as an essential basis for several computational techniques.
CE 101.2	Understand and solve algebraic and transcendental equations.
CE 101.3	Acquire the knowledge of infinite series, Taylor series & Malaren's series, Understand and determine the convergence of series
CE 101.4	Apply the knowledge of series expansions of functions
CE 101.5	Prove the results of partial differentiation. Apply partial differentiation for evaluating and proving the results.
CE 101.6	Apply Jacobian for evaluating and proving the results based on Errors and approximations, Maxima and minima.

Subject	Engineering Physics
Subject Code	CE102 (107002)
Course Outcom	ne (COs)
CE102.1	Students are enabled to derive the diffraction grating formula.
CE102.2	Students are capable to Calculate the reverberation time of a room and suggest how to design a room with optimal reverberation time
CE102.3	Students will be able to explain working principle of lasers.
CE102.4	Ability to estimate the charge carrier mobility and density in intrinsic & extrinsic Semiconductor, PN Junction diode
CE102.5	Students are capable to calculate the wavelength of a particle as a function of its momentum.
CE102.6	Ability to explain different methods of growth and synthesis of nana particles and its application in Engineering.

Subject	Engineering Graphics I
Subject Code	CE 103(102006)
Course Outcom	ne (COs)
CE 103.1	Students will be able to develop the manual drawing skill, drawing interpretation skill.
CE 103.2	Students will be able to develop the physical realization of the dimension & views of the objects.
CE 103.3	Student will be able to develop imagination of Physical Objects to be represented on paper for Engineering Communication.

Subject	Basic Electrical Engineering
Subject Code	CE 104(103004)
Course Outcome (COs)	
CE104.1	Relation between Voltage and Current.
CE104.2	Energy conversions.
CE104.3	Direction of Induced emf.
CE104.4	Transform of energy.
CE104.5	Understanding of a pure parameter.
CE104.6	Concept of three phase supply.
CE104.7	Response of element is identical with various sources.

Subject	Basic Civil & Environmental Engineering
Subject Code	CE 105(101005)
Course Outcom	ne (COs)
CE105.1	Understand the scientific terminologies related to civil engineering.
CE105.2	Familiarize with different components, equipment and technical of civil engineering materials of construction
CE105.3	Describe the structure and function of an ecosystem.
CE105.4	Explains the concept of built environment and its importance
CE105.5	Explain the causes, effects and control measures of various types of pollutions.

Subject	Fundamental of programming language -I
Subject Code	CE 106(110003)
Course Outcom	ne (COs)
CE106.1	To learn & acquire art of computer programming.
CE106.2	To know about some popular programming language and how to choose a programming language for solving a problem using a computer.
CE106.3	To learn basics of Programming in C

Subject	Workshop Practice
Subject Code	CE 107(102006)
Course Outcome (COs)	
CE107.1	Introduction to different material in engineering practices with respect to their workability, formability & machinability with hand tools & power & to develop skills through hands on experience.

Semester-II	
Subject	Engineering Mathematics II
Subject Code	CE 108(107008)
Course Outcome (COs)	
CE108.1	Solve the differential equations by choosing proper method of solution.
CE108.2	Solve the problems on orthogonal trajectories, simple electrical circuits, and heat flow by applying the mehods of Ordinary differential Equations.
CE108.3	Apply the properties of special functions to evaluate integral.
CE108.4	Apply the properties of special functions to evaluate integral. Sketch the curve with full justification.
CE108.5	Demonstrate knowledge and understanding of plane and solid geometry & use geometrical skills to solve simple real-world problems
CE108.6	Evaluate double integral and change the order of the integration. Evaluate area bounded between two curves, mass of Lamina, moment of inertia.

Subject	Engineering Chemistry
Subject Code	CE 109(107009)
Course Outcom	ne (COs)
CE 109.1	Technology involved in improving quality of water for its industrial use.
CE 109.2	Basicconcepts of electro analytical techniques that facilitate rapid and reliable measurements.
CE 109.3	Chemical structure of polymers and its effect on their various properties when used as engineering materials. To lay foundation for application the applications of polymers for specific applications and as composite materials.
CE 109.4	Study of fossil fuel and derived fuels with its properties and applications.
CE 109.5	An insight into carbon and hydrogen compounds with aspects of modern chemistry.
CE 109.6	The principles of chemical and electrochemical reactions causing corrosion and methods used for minimizing the corrosion.

Subject	Basic Mechanical Engineering
Subject Code	CE 110(102013)
Course Outcome (COs)	
CE110.1	This Course will help the students to acquire knowledge of mechanical engineering.
CE110.2	Describe the scope of mechanical engineering with multidisciplinary industries.
CE110.3	Understand & identify common machine element with their functions & power transmission deviCEs.
CE110.4	Learn conventional machine tools & understand the concept of design in mechanical engineering.
CE 110.5	Impart knowledge of basic concept of thermodynamics applied to industrial applications.
CE 110.6	Understand lying principles of energy conversion system & power plant.

Subject	Engineering Mechanics
Subject Code	CE 111(101011)
Course Outcome (COs)	
CE111.1	Apply fundamental knowledge of mathematics, science, and engineering.
CE111.2	Design and conduct mechanics experiments.
CE111.3	Analyze and interpret experimental and computational mechanics data
CE111.4	Design a system, component or process to meet desired needs by synergistically combining mechanics of materials, fluid mechanics, and dynamics, when necessary.
CE111.5	Identify, formulate, and solve engineering problems involving mechanics of rigid bodies.
CE111.6	Effectively function as a member of multi-disciplinary technical team and engage in life-long learning.

Subject	Basic Electronics Engineering
Subject Code	CE 112(104012)
Course Outcome (COs)	
CE 112.1	Get knowledge of some basic electronic components and circuits
CE 112.2	Understand basics of diodes and transistor circuits
CE 112.3	Understand working of some IC based circuits
CE 112.4	Analyze the logic gates and their usage in digital circuits
CE 112.5	Expose the students to working ofsome power electronics devices, transducers and application of transducers
CE 112.6	Understand the basic aspect of electronic communication systems

Subject	Fundamental of programming language -II
Subject Code	CE 113(110010)
Course Outcome (COs)	
CE113.1	To learn & acquire art of computer programming.
CE113.2	To know aboutsome popular programming language and how to choose a programming language for solving a problem using a computer.
CE113.3	To learn basics of Programming in C, Advanced Programming.

Subject	Engineering Graphics II
Subject Code	CE 114(102006)
Course Outcome (COs)	
CE114.1	Students will be able to develop the computerized drawing skill, drawing
	interpretation skill.
CE114.2	Students will be able to develop the physical realization of the dicension & views of
	the objects.

CE114.3	Student will be able to develop imagination of Physical Objects to be represented on software.
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Course Outcomes: Students should be able to Second Year Civil Engineering (SE) (Curriculum 2015 Pattern) Semester-I

Subject	Building Technology and Materials
Subject Code	CE201(201001)
Course Outcom	ne (COs)
CE201.01	Identify types of building and basic requirements of building components
CE201.02	Explain types of masonry, formwork, casting procedure and necessity of underpinning and scaffolding.
CE201.03	Elucidate different types of flooring and roofing materials.
CE201.04	Describe types of doors, windows, arches and lintel.
CE201.05	Illuminate means of vertical circulation and protective coatings
CE201.06	Explain different materials especially eco

Subject	Engineering Mathematics III
Subject Code	CE202(207001)
Course Outcom	ne (COs)
CE202.01	Solve higher order linear differential equations and apply to modeling and analyzing mass spring systems
CE202.02	Solve system of linear equations using direct and iterative numerical techniques and develop solutions to ordinary differential equations using single step and multistep methods applied to structural systems.
CE202.03	Apply statistical methods like correlation, regression analysis in analyzing, interpreting experimental data and probability theory in testing and quality control.
CE202.04	Perform vector differentiation & vector integration, analyze the vector fields and apply to fluid flow problems.
CE202.05	Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.

Subject	Surveying
Subject Code	CE203(201006)

Course Outcome (COs)	
CE203.01	Operate and use surveying equipment.
CE203.02	Draw plan or map of the existing permanent features on the ground.
CE203.03	Classify the ground features from the map or plan.
CE203.04	Analyze temporary adjustments and check permanent adjustments of the Theodolite
CE203.05	Know different types and applications of Curves
CE203.06	Know Construction Survey & Various Space Based Positioning System (SBPS)

Subject	Strength of Materials
Subject Code	CE204(201002)
Course Outcome (COs)	
CE204.01	Compute different type of stresses in determinate, indeterminate, homogeneous and composite structures.
CE204.02	Develop bending and shear stress diagram.
CE204.03	Determine the torsional stresses and stresses due to strain energy for different loading conditions.
CE204.04	Explain the concept of principal stresses due to combined loading and able to compare the values of analytical and graphical (Mohr's circle) method. CE
CE204.05	Plot loading diagram, Shear Force Diagram (SFD) and Bending Moment Diagram (BMD).
CE204.06	Analyze axially and eccentrically loaded column

Subject	Geotechnical Engineering
Subject Code	CE205(201003)
Course Outcome (COs)	
CE205.01	Differentiate the different types of soil and their engineering properties and classify
	them.
CE205.02	Determine the soil properties in laboratory and develop a proficiency in handling experimental data.
CE205.03	Understand of the concept of effective stress and its influence on soil behavior.
CE205.04	Develop an understanding of the influence of water flow on the engineering behaviour of soils.
CE205.05	Analyze engineering properties like compaction, permeability, soil shear strength.

CE205.06	Compute the lateral thrust due to backfill on the retaining walls.
CE205.07	Classify soil slopes and identify their modes of failure.

Subject	Audit Course 1 Awareness to Civil Engineering Practices
Subject Code	CE206
Course Outcon	ne (COs)
CE206.01	Understand Different types of civil engineering industries and their functioning.
CE206.02	Understand Applications of different documents, drawings, regulations in Civil Engineering Industries.
CE206.03	Understand Code of ethics to be practiced by a Civil Engineer and understand duties and responsibilities as a Civil Engineer
CE206.04	Different safety practices on the site.

Semester-II

Subject	Fluid Mechanics
Subject Code	CE207(201004)
Course Outcome (COs)	
CE207.01	Use fluid properties, dimensional analysis for solving problems of fluid flow.
CE207.02	Solve fluid statics problems
CE207.03	Measure fluid pressure.
CE207.04	Calibrate discharge measuring instrument like ventrurimeter, orifice meter.
CE207.05	Distinguish between various types of fluid flows and find the fluid velocity using principles of Kinematics and Dynamics.
CE207.06	Design pipes to carry particular amount of discharge.

Subject	Architectural Planning and Design of Building
Subject Code	CE208(201005)
Course Outcome (COs)	
CE208.01	Make use of principles of planning and principles of architectural Planning
CE208.02	Analyze the available primary or secondary data and plan different types of structures considering futuristic need of an area.
CE208.03	Improve the status of existing structures by proposing appropriate green measures
CE208.04	Plan effectively various types of buildings according to their utility with reference to different codes.
CE208.05	Understand and resolve contemporary issues at multi-dimensional functional levels.

Subject	Structural Analysis I
Subject Code	CE209(201008)
Course Outcome (COs)	
CE209.01	Understand the basic concept of static and kinematic indeterminacy, slope and deflection of determinate and indeterminate beams for analysis of structures.
CE209.02	Analyze indeterminate beams structures and frames.
CE209.03	Evaluate determinate and indeterminate trusses and its application in the field.
CE209.04	Apply influence line diagrams for the analysis of structures under moving load.
CE209.05	Analyze two and three hinged arches and its application.
CE209.06	Apply plastic analysis for indeterminate steel structures by limits state method.

Subject	Engineering Geology
Subject Code	CE210(207009)
Course Outcome (COs)	
CE210.01	Explain the basic concepts of engineering geology.
CE210.02	Differentiate between the different rock types, their inherent characteristics and their application in civil engineering.
CE210.03	Understand physical properties, mechanical properties of the minerals and their application in civil engineering
CE210.04	Identify favorable and unfavorable conditions for the buildings, roads, dam, tunneling etc through the rocks.
CE210.05	Explain mass wasting processes, effects of mass wasting process on the civil engineering structures and remedial measures.
CE210.06	Interpret geohydrological characters of the rocks present at the foundations of the dams, percolation tanks, tunnels.
CE210.07	Understand Seismic activities and its effect on the civil engineering construction.
CE210.08	Identify geological hazards and presence of ground water.

Subject	Concrete Technology
Subject Code	CE211(207007)
Course Outcome (COs)	
CE211.01	Understand chemistry, properties, and classification of cement, fly ash, aggregates and admixtures, and hydration of cement in concrete.
CE211.02	Prepare and test the fresh concrete
CE211.03	Test hardened concrete with destructive and nondestructive testing instruments
CE211.04	Get acquainted to concrete handling equipments and different special concrete types
CE211.05	Design concrete mix of desired grade
CE211.06	Predict deteriorations in concrete and repair it with appropriate methods and techniques.

Subject	Soft Skill
Subject Code	CE212 (201010)
Course Outcome (COs)	
CE 212.01	To help the students in building interpersonal skills.
CE 212.02	To develop skill to communicate clearly.
CE 212.03	To enhance team building and time management skills.
CE 212.04	To learn active listening and responding skills.

Subject	Audit Course 2 Road Safety Management
Subject Code	
Course Outcome (COs)	
CE 213.01	To provide basic overview on road safety & traffic management issues in view of the alarming increase in vehicular population of the country.
CE 213.02	To explain the engineering & legislative measures for road safety.
CE 213.03	To discuss measures for improving road safety education levels among the public.

Course Outcomes: Students should be able to

Third Year Civil Engineering (TE) (Curriculum 2015 Pattern) Semester-I

Semester 1	
Subject	Hydrology and water resource engineering.
Subject Code	CE 301 (301001)
Course Outcome (COs)	
CE 301.01	Build on the student's background in hydrology and hydraulics and understanding of
	water resources systems.
CE 301 02	Understand the basic requirements of irrigation and various irrigation techniques,
CE 301.02	requirements of the crops
CE 301.03	Develop skills in the ground water flow, type of aquifer and yield from the well
CE 301.04	Knowledge about Runoff, Floods and estimation of future flood frequencies.
CE 301.05	Knowledge of design of reservoir, operation and sedimentation
CE 301.06	Knowledge of Water management and effects, causes and remedial measures of
	water logging and drainage.

Subject	Infrastructure Engineering and Construction Techniques	
Subject Code	CE 302 (301002)	
Course Outcome (COs)		
CE 302.01	Understand the scope of Infrastructure in development and identify various components of railways.	
CE 302.02	Comprehend the amenities of rail track, its maintenance and development of railways.	

CE 302.03	Apply different construction techniques in underwater construction.
CE 302.04	Understand types, methods of excavation, equipments used in tunneling under
	various fock structures.
CE 302.05	Understand types, requirements, applications of docks, harbors and ports.
CE 302.06	Identify and comprehend the application of various construction equipments.

Subject	Structural Design-I
Subject Code	CE 303 (301003)
Course Outcome (COs)	
CE 303.01	Knowledge of steel structure and understand various Indian Standard codes and its application and capable in design of tension member
CE 303.02	Understand Buckling classification, design of strut and axially loaded column
CE 303.03	Capable in design of column and column bases
CE 303.04	Capable in design of laterally supported beam as per codal provision.
CE 303.05	Capable in design of beam to beam connection and beam to column connection
CE 303.06	Capable in design of Gantry Girder and roof truss

Subject	Structural Analysis-II
Subject Code	CE 304 (301004)
Course Outcome (COs)	
CE 304.01	Ability to idealized & analyze statically determinate and indeterminate structures by slope-deflection method.
CE 304.02	Ability to analyze Beam & frame structures by moment distribution method.
CE 304.03	Determine internal forces and reactions in determinate and indeterminate structures subjected to moving loads.
CE 304.04	Ability to solve statically indeterminate structures using matrix (Stiffness) Method.
CE 304.05	To determine deflection of beams & frames using central difference method or classical method.
CE 304.06	Familiarity with Finite element structural engineering used for complex structures.

Subject	Fluid Mechanics II
Subject Code	CE 305 (301005)
Course Outcome (COs)	
CE 305.01	Understand the Fluid Flow around Submerged Objects & Unsteady Flow
CE 305.02	Understand the Open channel flow & its depth – energy relationship.
CE 305.03	Understand the Uniform flow in open channels & concept of hydraulic jump & its phenomenon.
CE 305.04	Understand the Force and work done due to impact of jet & centrifugal pumps principle & it's working.

CE 305.05	Understand the Hydropower generation & Performance of hydraulic turbines
CE 305.06	Understand the Gradually Varied Flow in Open Channels& its computations.

Subject	Employability Skills development
Subject Code	CE 306 (301006)
Course Outcome (COs)	
CE 306.01	Development of Employability skills.
CE 306.02	Development of Interpersonal skills.
CE 306.03	Understand and development of Presentation skills.
CE 306.04	To develop communication skills.
CE 306.05	To make awareness of Commercial profession.
CE 306.06	To develop Personal skills to work as leader and ability to work in a team.

Semester-II

Subject	Advanced Surveying
Subject Code	CE 307 (301007)
Course Outcome (COs)	
CE 307.01	Understand geodetic and triangulation surveying and apply SBPS in solving engineering problems
CE 307.02	Know objects, applications of Hydrographic Surveying.
CE 307.03	Importance of Remote sensing and GIS, Apply GIS in solving engineering problems
CE 307.04	Plan and execute triangulation survey, Know the triangulation adjustments, Identify and correct errors in field measurements
CE 307.05	Make measurements on satellite images and aerial photographs using photogrammetric concepts
CE 307.06	Know trigonometric leveling and setting out construction works.

Subject	Project Management and Engineering Economics
Subject Code	CE 308 (301008)
Course Outcome (COs)	
CE 308.01	Understand the importance and functions of management in construction industry.
CE 308.02	Carryout scheduling and network analysis of construction projects
CE 308.03	Understand management of materials and equipment and Safety norms.
CE 308.04	Carryout resource allocation and acquire knowledge of soft ware's.
CE 308.05	Understand economics of construction projects and its importance in decision
	making.
CE 308.06	Study use of project appraisal report and understand the role of Project Management
	Consultant

Subject	Foundation Engineering
Subject Code	CE 309(301009)
Course Outcome (COs)	
CE 309.01	Develop an understanding of the subsurface investigations for foundations.
CE 309.02	Compute the bearing capacity.
CE 309.03	Understand the concept of settlement and consolidation settlement.
CE 309.04	To know the deep foundations and its types and suitability.
CE 309.05	Understand the types of cofferdams and knowledge of properties of black cotton soils.
CE 309.06	Develop an understanding of the soil reinforcement and earthquake geo-techniques.

Subject	Structural Design-II
Subject Code	CE 310(301010)
Course Outcome (COs)	
CE 310.01	Understanding of the concepts Working stress method, Ultimate load method and Limit state method. Design philosophy
CE 310.02	Understanding principles of limit state design and design of singly and doubly reinforced beams and slab.
CE 310.03	Design slab and staircase.
CE 310.04	Design of flexural members
CE 310.05	Analyze and design for shear, torsion bond and Redistribution of moments in continuous reinforced concrete beam
CE 310.06	Design column and footing.

Subject	Environmental Engineering-I
Subject Code	CE 311(301011)
Course Outcome (COs)	
CE 311.01	Explain sources, effects, preventive measures of noise pollution, air pollution and municipal solid waste.
CE 311.02	Comprehend components of water supply scheme, appropriateness of water intake structures, quantity and quality of water.
CE 311.03	Comprehend principles of water treatment, describe and design aeration fountain and sedimentation tanks.
CE 311.04	Describe and design of Coagulation, Flocculation processes and Filtration.
CE 311.05	Understand disinfection processes, water softening methods, demineralization, fluoridation and defluoridation.
CE 311.06	Describe and design parts of water distribution systems and Rain water harvesting system and to understand the concept of packaged water treatment units.

Subject	Seminar
Subject Code	312(301012)
Course Outcome (COs)	
CE 312.01	Analysis and comprehension of proof-of-concept and related data.
CE 312.02	Establish motivation for any topic of interest and develop a thought process for
	technical presentation.
CE 312.03	Organize a detailed literature survey and build a document with respect to technical
	publications.
CE 312.04	Make use of new and recent technology (e.g. Latex) for creating technical reports
CE 312.05	Effective presentation and improve soft skills.

<mark>Course Outcomes: Students should be able to</mark> Final Year Civil Engineering (BE) (Curriculum 2012 Pattern)

Subject	Environmental Engineering II
Subject Code	CE401(401 001)
Course Outcome (COs)	
CE 401.01	Determine the sewage characteristics and comprehend the quality and quantity of sewage.
CE 401.02	Understand the process and component parts of waste water treatment. Also students can design screen chambers, grit chambers and primary settling tank.
CE 401.03	Design secondary treatment units along with activated sludge process and trickling filters.
CE 401.04	Comprehend the need, working principle and design of low cost treatment methods.
CE 401.05	Understand the importance, merits and demerits of onsite sanitation and packaged sewage treatment units.
CE 401.06	Carry out risk assessment of waste water generated by Industries such as sugar, distillery etc and treatment technologies adopted by such industries.

Subject	Transportation Engineering
Subject Code	CE402(401 002)
Course Outcome (COs)	
CE 402.01	Understand the types of roads, various engineering surveys and traffic studies carried out for data collection for design of roads.
CE 402.02	Design the geometric elements of roads
CE 402.03	Acquire knowledge about the various road construction materials, their quality testing and design & construction of pavements
CE 402.04	Understand the various concepts and terms related to Air Transportation System.
CE 402.05	Acquire knowledge about components of bridges, data collection and design loads on Bridges.
CE 402.06	Acquire knowledge about classification, construction and maintenance of Bridges

Subject	Structural Design and Drawing III
Subject Code	CE403(401 003)
Course Outcome (COs)	
CE 403.01	Analyse a prestressed concrete beam accounting for losses also design the anchorage zone for post tensioned members
CE 403.02	Analyse & design of vertical & horizontal shear in post tensioned prestressed concrete for flange section and the design of post tensioned slab.
CE 403.03	Identify various methods of analysis and design for frame type structure under lateral and vertical loading condition.
CE 403.04	Develop an appreciation of the design philosophy for deep excavation and retaining wall projects.
CE 403.05	Design combined reinforced concrete foundation using both conventional approaches and elastic methods.
CE 403.06	Design structural elements of a water retaining structure (Water tanks) for serviceability limit state of crack control and ultimate limit state

Subject	Elective I- Architecture and Town Planning
Subject Code	CE404(401 004)
Course Outcome (COs)	
CE 404.01	Understand concepts, theories, and practices of the discipline of architecture
CE 404.02	Acquire knowledge of urban quality of life with importance of sustainable planning with case study analysis
CE 404.03	Acquire knowledge of different levels of town planning with detailed components of planning
CE 404.04	Acquire knowledge of different civic services and role of planning agencies for various planning levels
CE 404.05	Understand legislative mechanism of town planning
CE 404.06	Acquire knowledge of technological applications in town planning

Subject	Elective II -TQM & MIS in Civil Engineering
Subject Code	CE405(401 005)
Course Outcome (COs)	
CE 405.01	Understand the concept of quality in construction and its importance
CE 405.02	Understand the concept of MIS in construction and necessary support systems and
CE 405.03	Understand the concept of Six Sigma in construction and its use to minimize the defects in construction
CE 405.04	Understand the terminology of quality systems and documentation of QMS
CE 405.05	Understand various MIS structures and cost of quality
CE 405.06	Acquire knowledge of ERP software, GIS, GPS, Android subsystems for
	documentation and monitoring of construction projects

Subject	Project –I
Subject Code	CE 406(401006)
Course Outcome (COs)	
CE 406.01	Identify, formulate and solve problems related to civil engineering.
CE 406.02	Work in a group as a part of multidisciplinary team with professional responsibility
CE 406.03	Analysis and design of structure to meet desired needs within realistic constraints.
CE 406.04	Review literature and finalize problem statement.
CE 406.05	Plan activity schedule and implementation in a given time span.
CE 406.06	Prepare and present technical report.
CE 406.07	Apply modern design and analysis tools.

Semester-II

Subject	Dams and Hydraulic Structures
Subject Code	CE 407(401007)
Course Outcome (COs)	
CE 407.01	Understand the various types of dams and select a particular type considering technical, economic, environmental, climatic, topographic and social factors
CE 407.02	Understand the importance of dam safety and instrumentation required to assess the health of dam.
CE 407.03	Understand the construction & maintenance of gravity dam, earth dam, arch dam, buttress dam and Carry out stability analysis of gravity dam, earth dam & weir.
CE 407.04	Acquire knowledge about components, classification, significance and selection of spillway, energy dissipating devices, spillway gates, diversion head works, canal, canal structures, cross drainage works and River training structures
CE 407.05	Design of Ogee spillway, weir on permeable foundation, lined canal, cross drainage works.
CE 407.06	Acquire knowledge about components, classification and layout of hydropower plants.

Subject	Quantity Surveying, Cotracts and Tenders
Subject Code	CE 408(401008)
Course Outcome (COs)	
CE 408.01	Workout approximate estimates and understand terminology of estimation
CE 408.02	Taking out quantities &Detailed estimate up to plinth
CE 408.03	Prepare detailed estimate for super structure, Understand the concept of Valuation and carryout valuation of real estate
CE 408.04	Draft specifications for various items of work and carry out rate analysis for those items
CE 408.05	Understand terminology of tendering and execution of works, draft tender notice for civil engineering works
CE 408.06	Acquire knowledge about Contracts and Arbitration, draft conditions of contract

Subject	Elective III- Air Pollution and control
Subject Code	CE 409(401009)
Course Outcome (COs)	
CE 409.01	Understand meteorological aspects governing the air pollution.
CE 409.02	Comprehend sampling and analysis of ambient air.
CE 409.03	Describe and understand causes, sources, effects, measurement methods and control measures of indoor air pollution.
CE 409.04	Understand various processes and equipments used for control of air pollution.
CE 409.05	Understand economics of air pollution control and legislations used for air pollution control.
CE 409.06	Comprehend methodology of environmental impact assessment and management and know environmental impacts of various industries.

Subject	Elective IV- Construction Management
Subject Code	CE 410 A(401 009)
Course Outcome (COs)	
CE 410A.01	Understand the importance, applications and scope of construction management.
CE 410A.02	Prepare the construction project schedule and apply the concept of work study.
CE 410A.03	Understand the need, importance and provisions of some important labour laws associated with construction sector and acquire knowledge of financial aspects of construction projects.
CE 410A.04	Analysis risk associated with construction project using some mathematical models, mitigation of project risks and understand concepts of value engineering.
CE 410A.05	Acquire knowledge of various techniques of materials management and human resource management.
CE 410A.06	Acquire knowledge about basic terminologies and applications of artificial intelligence technique in civil engineering

Subject	Elective IV- Statistical Analysis and Computational Methods in Civil Engineering
Subject Code	CE 410 B(401 010)
Course Outcome (COs)	
CE 410B.01	Apply some numerical methods for root finding.
CE 410B.02	Understand various rules of numerical Integration and apply Gauss Quadrature
	method.
CE 410B.03	Apply optimization techniques
CE 410B.04	Perform statistical analysis
CE 410B.05	Calculate probability and understand probability distributions
CE 410B.06	Perform correlation analysis and regression analysis

Subject	Project – II
Subject Code	CE 411(401 011)
Course Outcome (COs)	
CE 410.01	Identify, formulate and solve problems related to mechanical engineering.
CE 410.02	Work in a group as a part of multidisciplinary team with professional responsibility
CE 410.03	Analysis and design of structure to meet desired needs within realistic constraints.
CE 410.04	Review literature and finalize problem statement.
CE 410.05	Plan activity schedule and implementation in a given time span.
CE 410.06	Prepare and present technical report.
CE 410.07	Apply modern design and analysis tools.