



Excellence in Higher Education

# AKSHAYA

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, Recognized by UGC and Affiliated to Anna University)

Accredited by NAAC | Accredited by NBA : UG programmes of CSE & ECE

Kinathukadavu, Coimbatore-642109. www.acetcbe.edu.in



## DEPARTMENT OF CIVIL ENGINEERING

### COURSE OUTCOMES (REGULATION 2021)

#### SEMESTER III

<b>MA3351: Transforms and Partial Differential Equations</b>	
C201.1	Solve the given standard partial differential equations.
C201.2	Apply the principles of Fourier series to solve engineering problems and evaluate their results in practical applications
C201.3	Apply Fourier series techniques to solve one- and two-dimensional heat flow problems and one-dimensional wave equations
C201.4	Apply the mathematical principles of Fourier transforms to formulate and solve engineering-related physical problems
C201.5	Use the Z-transform techniques to solve given difference equations.
<b>ME3351: Engineering Mechanics</b>	
C202.1	Illustrate the vector and scalar representation of forces and moments.
C202.2	Analyse the rigid body in equilibrium.
C202.3	Evaluate the properties of distributed forces.
C202.4	Determine the friction and the effects by the laws of friction.
C202.5	Calculate dynamic forces exerted in rigid body.
<b>CE3301: Fluid Mechanics</b>	
C203.1	Examine the various properties of fluids and variation of pressure under static condition.
C203.2	Apply continuity equation and Bernoulli's equation for solving various types of fluid flows problems associated with fluid kinematics and dynamics.
C203.3	Perform dimensional analysis and model analysis to validate various hydraulic engineering problems.
C203.4	Evaluate major and minor losses associated with fluid flow in piping networks

C203.5	Interpret the boundary layer aspects of laminar and turbulent flows
<b>CE3302: Construction Materials and Technology</b>	
C204.1	Determine whether concrete blocks, bricks, stones, and lime are of high quality, and also classify and test the materials.
C204.2	Recognize the many applications for composite materials like FRP, Geomembranes, geotextiles and the market forms of steel, aluminium and timber.
C204.3	Determine the optimum building design and maintenance techniques, such as thermal insulation and building air conditioning.
C204.4	Select various equipment for earthwork excavation, concreting, and material handling, erection of structures, dewatering and pumping equipment.
C204.5	Understand the construction planning, scheduling the activities along with CPM and PERT network modelling and time analysis.
<b>CE3303: Water Supply and Wastewater Engineering</b>	
C205.1	Comprehend the different elements of a water supply system, characteristics of water, design of intake structures and conveyance systems for transmitting water.
C205.2	Develop analytical skills and design physical unit's of water treatment plant in Construction, Operation and Maintenance aspects.
C205.3	Demonstrate the Principles, design of water supply in buildings and develop the water distribution network system.
C205.4	Design effective sewer systems, including gravity and pressure sewers, and incorporate pumping stations where necessary and Analyze the characteristics and composition of sewage and apply this knowledge to estimate sewage generation rates
C205.5	Interpret the sludge analysis and design the sludge treatment process and apply knowledge for dispose sludge in proper way.
<b>CE3351: Surveying and Levelling</b>	
C206.1	Introduce the rudiments of various surveying and its principles and fundamentals of Conventional Surveying
C206.2	Imparts knowledge in computation of levels of terrain ground features and temporary and permanent adjustments
C206.3	Imparts concepts of theodolite Surveying for complex surveying operations and temporary and permanent adjustments of trigonometric levelling
C206.4	Understand the procedure for establishing horizontal and vertical control and error propagation and linearization
C206.5	Imparts the knowledge on modern surveying instruments of total Station and digital theodolite, EDM, Electronic field book
<b>CE3361: Surveying and Levelling Laboratory</b>	
C207.1	Impart knowledge on the use of conventional surveying instruments like chain/tape, compass and levelling instruments.
C207.2	Develop knowledge about levelling instrument which is used for different surveying operations.
C207.3	Utilize advanced equipment's like theodolite instrument which is used for measuring horizontal angles and vertical angles.

C207.4	Carry out the elevation of the objects using tacheometer by Single plane and stadia method.
C207.5	Determine the gradient of a line by tangential tacheometry, total station and to prepare plan metric maps.
<b>CE3311: Water and Wastewater Analysis Laboratory</b>	
C208.1	Gain knowledge about water sampling and preservation techniques and analyse the physical characteristics of water.
C208.2	Assess the chemical characteristics of water such as iron, sulphate, coagulant, chlorine, available Chlorine in Bleaching powder and residual chlorine in water sample
C208.3	Estimate the availability of total solids, dissolved solids and settle able solids in the wastewater.
C208.4	Determine the Sludge Volume Index, Bio-Chemical Oxygen demand, Chemical Oxygen demand and presence of ammonia in the wastewater sample.
C208.5	Test and Confirm total and faecal coliform by using most probable number (MPN) test
<b>GE3361: Professional Development</b>	
C209.1	Analyze the different tools in MS Word that can be used to structure and organize content for creating technical and academic documents.
C209.2	Apply MS Excel functions to organize, retrieve, and analyze data, and create visual representations for improved understanding.
C209.3	Assess the effectiveness of different MS Excel tools for visualizing data and retrieving it according to specific requirements.

#### SEMESTER IV

<b>CE3401: Applied Hydraulics Engineering</b>	
C210.1	Explain the fundamentals of open channel flow, as well as classify and analyze uniform flow under steady state conditions using a particular energy concept and its application.
C210.2	Use direct and standard step procedures to analyze constant, gradually varied flow, water surface profiles and its length calculation when there is a change in water surface profiles because of grade changes.
C210.3	Calculate the energy loss in a hydraulic jump when exposed to positive and negative surges, as well as the relationship between the successive depths of stable, rapidly varying flow.
C210.4	Design turbines and describe how they operate with various components work together to convert energy.
C210.5	Differentiate between centrifugal and reciprocating pumps, describe their operation using characteristic curves and design them.

<b>CE3402: Strength of Materials</b>	
C211.1	Recognise the meanings of primary stresses, principal planes, and stress and strain.
C211.2	Ascertain the shear force and bending moment in beams and comprehend the basic bending theory.
C211.3	Determine the deflection of beams using several techniques and choose a method for calculating the slope or deflection.
C211.4	Examine continuous, fixed, and propped beams for external loads and settlement support.
C211.5	Ascertain the stresses resulting from asymmetrical beam bending, identify the shear centre, and examine the diverse theories of failure.
<b>CE3403: Concrete Technology</b>	
C212.1	Identify the qualities of the materials used in the preparation of concrete, as well as the needs for cement, aggregates, and water.
C212.2	Choose appropriate admixtures to improve the characteristics of the concrete and learn more about the mineral and chemical admixtures that are present in the concrete.
C212.3	Design concrete mixes using the IS technique of mix design and become knowledgeable about the characteristics and ratios associated with mix design according to the most recent IS code.
C212.4	Analyze the characteristics of both fresh and hardened concrete by comprehending the test protocols in accordance with the most recent IS code.
C212.5	Recognize the significance of unique concretes for particular needs and comprehend the uses and benefits of special concrete in the contemporary environment.
<b>CE3404: Soil Mechanics</b>	
C213.1	Explain the fundamental properties of soils, including classification, phase relationships, and soil composition, for application in geotechnical engineering
C213.2	Analyze permeability and seepage in soil mediums, evaluate fluid flow through soils, and assess their implications on engineering solutions
C213.3	Evaluate stress distribution in soils due to surface loads and understand soil settlement behavior caused by consolidation under varying conditions
C213.4	Exhibit an understanding of soil shear strength and its influence on engineering solutions for loaded soils, while staying informed about current issues related to soil shear strength.
C213.5	Design finite and infinite slopes, applying stability analysis principles to meet engineering specifications and practical requirements
<b>CE3405: Highway and Railway Engineering</b>	
C214.1	Understand the need of highway infrastructure, its design, construction for both in rural and urban areas using conventional and modern methods.
C214.2	Demonstrate the ability to focus on different elements related to the design of highways and proceed the practice for flexible and rigid pavements using IRC methods.

C214.3	Study different materials used in highway construction and the testing of different materials along with the maintenance of pavements.
C214.4	Understand different elements of permanent way, gauge selection, surveys using conventional and modern methods and design efficiently for construction of railway structures.
C214.5	Design and understand the working principle of railway track and utilize the knowledge in maintenance of the track and the operational part in the railway tracks.
<b>GE3451: Environmental Sciences and Sustainability</b>	
C215.1	Understand the concept of Environment and bio diversity, duty of individual in conversation of environment and bio diversity.
C215.2	Create awareness on environmental pollution, its causes, effects and control, management of natural disasters.
C215.3	Understand energy management and conservation and also the importance of new sources of energy.
C215.4	Understand the sustainability and management process and analyse climate changes, concept of carbon credit and the challenges of environmental management.
C215.5	Analyse the role of sustainable urbanization and to understand green materials, energy cycles and explain the rules and regulation of sustainability practices.
<b>CE3411: Hydraulic Engineering Laboratory</b>	
C216.1	Apply Bernoulli equation and determination the coefficient of discharge through Rotameter, venurimeter and orificemeter
C216.2	Determine the major losses in pipe, Darcy's friction factor and minor losses in pipes and compare with Moody diagram.
C216.3	Identify the performance characteristics of Centrifugal pumps, Gear pump and roto dynamic pumps.
C216.4	Figure out the performance characteristics of Submersible pump, Reciprocating pump and displacement pumps.
C216.5	Check the performance characteristic of Pelton wheel turbine, Francis turbine, and Kaplan turbine and to determine the Metacentric height of floating bodies.
<b>CE3412: Materials Testing Laboratory</b>	
C217.1	Test for the mechanical properties of different types of steel rod, metal beams and springs
C217.2	Determine the physical properties of cement by using fineness, consistency test, Vicat apparatus and specific gravity test
C217.3	Assess the physical properties of fine and coarse aggregate by using specific gravity, water absorption, loose bulk density and impact value test
C217.4	Estimate the flakiness & elongation index, crushing value, coarse aggregate, compressive strength, water absorption of coarse aggregate
C217.5	Determine the workability and compressive strength of concrete by using slump cone and compressible strength test

<b>CE3413: Soil Mechanics Laboratory</b>	
C218.1	Determine the index properties of soils using specific gravity test, Liquid limit and plastic limit test.
C218.2	Identify the properties of soils utilising sieve analysis and Hydrometer analysis
C218.3	Assess the insitu density using standard proctor compaction test and Field density of soil using sand replacement method.
C218.4	Test the properties of cohesive soil, compressibility, permeability and shear strength using Direct shear test, Unconfined compression test and California Bearing Ratio Test
C218.5	Understand the tensile strength and interfacial friction angle on Geosynthetics.

### SEMESTER V

#### **CE3501: Design of Reinforced Concrete Structural Elements**

C301.1	Interpret the properties and behaviour of concrete and steel reinforcement materials, including their strengths, weaknesses and to know various design concepts to design RC rectangular beams by working stress and limit state methods.
C301.2	Designing the reinforced concrete elements to determine shear, torsion, anchorage development length and the effects of loads and forces.
C301.3	Designing reinforced concrete structural elements slabs and staircases ensuring they meet safety and performance criteria.
C301.4	Design short columns for axial, uni-axial and bi-axial eccentric loadings similar with relevant design codes and standards and apply them in their design process.
C301.5	Detailed design calculations of wall footings, isolated footings and combined rectangular, including the selection of appropriate reinforcement and concrete mix, and ensure that the elements satisfy both strength and serviceability requirements.

#### **CE3502: Structural Analysis I**

C302.1	Analyze the deflections of pin-jointed plane frames and space frames also change in temperature method of tension coefficient
C302.2	Analyse the continuous beams, rigid frames with inclined members and support settlements by using slope deflection method
C302.3	Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
C302.4	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
C302.5	Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.

#### **CE3503: Foundation Engineering**

C303.1	Evaluate to plan and execute a detailed site investigation to select geotechnical design parameters and type of foundation
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C303.2	Demonstrate an ability to design shallow foundations, its component or process as per the needs and specifications.
C303.3	Illustrate an ability to design combined footings and raft foundations, its component or process as per the needs and specifications.
C303.4	Illustrate an ability to design deep foundations, its component or process as per the needs and specifications.
C303.5	Demonstrate an ability to design retaining walls, its component or process as per the needs and specifications.
<b>CE3005: Rehabilitation/ Heritage Restoration</b>	
C304.1	Understand the importance of maintenance and assessment method of distressed structures.
C304.2	Identify the quality of concrete based on strength, durability properties and their effects due to climate and temperature.
C304.3	Acquire the knowledge of various special concrete over conventional concrete and its application in construction.
C304.4	Examine different techniques used to repair concrete elements and Corrosion protection reinforced concrete and steel structures.
C304.5	Identify the strengthening techniques, repair and restoration of heritage structures.
<b>CE3013: Advanced Construction Techniques</b>	
C305.1	Acquire knowledge on various latest techniques like Jacking, Piping , Grouting and Anchoring which are involved in substructure construction
C305.2	Understand the principles and concepts relevant to super structure construction for concreting operation in tall buildings of various shapes and varying sections, aerial transporting, handling and erection.
C305.3	Illustrate the various concepts in erection of lattice towers and rigging used in the construction of special structures like Silos, Chimney, Sky Scrapers.
C305.4	Apply the concepts of seismic retrofitting techniques for strengthening of slabs, beams and columns along with soil stabilization techniques.
C305.5	Identify the suitable demolition technique using machines, explosives, robotic machines and safe dismantling techniques for demolishing a building.
<b>CE3026 : Traffic Engineering and Management</b>	
C306.1	Conduct traffic surveys, evaluate issues, and connect them to standards using your understanding of science and engineering principles.
C306.2	Recognize the fundamentals of traffic flow characteristics and how they relate to one another and also to analyse the traffic stream flow characteristics.
C306.3	Identify different the approaches to traffic management that address the applications of ITS and demand pricing with various traffic control devices for traffic segregation.
C306.4	Creating a variety of regulatory and control measures to meet the needs of an effective traffic network by designing the road intersections and interchanges.
C306.5	Identify different kinds of facilities and make plans for non-motorized transportation and also to design the parking, pedestrian pathway and cycle tracks.

<b>MX3084: Disaster Risk Reduction and Management</b>	
C307.1	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)
C307.2	To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction
C307.3	To develop disaster response skills by adopting relevant tools and technology
C307.4	Enhance awareness of institutional processes for Disaster response in the country.
C307.5	Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity
<b>CE3511: Highway Engineering Laboratory</b>	
C308.1	Determine the properties of aggregate using specific gravity, abrasion test and water absorption test.
C308.2	Ascertain the Quality of Bitumen using specific gravity, Consistency and Softening point test
C308.3	Estimate the loss of bitumen on heating and determine the ductility value of the bitumen
C308.4	Test the optimum binder content of the bitumen using Marshall method
C308.5	Assess the stripping value and bitumen content in the bituminous mix by cold solvent extraction method
<b>CE3512: Survey Camp (2 weeks)</b>	
C309.1	Provide civil engineering students with the basic knowledge to carry out field surveying
C309.2	To gain knowledge of basic survey instruments to identify the errors in surveying
C309.3	Educate civil engineering students in performing and interpreting survey instruments.
C309.4	Ability draw plans and maps for survey area
C309.5	To provide students with basic understanding of surveying methods.
<b>SEMESTER VI</b>	
<b>CE3601: Design of Steel Structural Elements</b>	
C310.1	Determine the design strengths of bolted and welded connections, as well as the various failure types of these connections. Acknowledge the design philosophy of steel structures.
C310.2	Choose the best section size and shape based on specified design requirements for tension and compression members, beams, and members.



C310.3	Conduct an analysis and design of steel tension members, columns, column bases, and beams using the current code requirements, techniques, and concepts.
C310.4	Determine and calculate the roof trusses, purlin, gantry girder design loads on industrial structures and to gain knowledge on pre-engineered buildings
C310.5	Determine the loads on continuous beams, purling and portal frames using plastic analysis approach.
<b>CE3602: Structural Analysis II</b>	
C311.1	Analyse the statically determinate structures, draw influence lines and compute the critical stress resultants.
C311.2	Recognise the Muller-Breslau principle and calculate the influence lines for beams that are statically indeterminate.
C311.3	Analyse the three-hinged, two-hinged and fixed arches - Parabolic and circular arches - influence lines, rib shortening
C311.4	Analyse the suspension bridges, Influence lines for three hinged stiffening girders and space trusses using method of tension coefficients
C311.5	Analyse the gravity loadings and frames using approximation techniques for horizontal stresses and gravity.
<b>AG3601: Engineering Geology</b>	
C312.1	Describe the internal structure of earth and its relation to earthquakes. Landforms created by various geological agents and their importance in civil engineering.
C312.2	Gain knowledge on various minerals and rocks that can be used as construction materials and road aggregates. In addition, testing the suitability of rocks for foundation purposes
C312.3	Study various geological structures and their impact in engineering constructions. Further, learning the geomechanical properties of rocks and their significance in engineering projects.
C312.4	Gain knowledge on the role of geological mapping, remote sensing and geophysics for surface and subsurface investigations. In addition, students will also gain knowledge on borehole logging techniques and their applications in civil engineering.
C312.5	Apply geological knowledge for designing and constructing major civil engineering structures, and also mitigating various geological hazards such as earthquakes, landslides and tsunamis.
<b>CE3003: Prefabricated Structures</b>	
C313.1	Understand Need for prefabrication and principles Standardization, production, transportation, erection of prefabrication, components.
C313.2	Acquire knowledge Behaviour and types of structural components, panel systems, slabs, beams, shear walls and columns used in precast construction.
C313.3	Gain knowledge of design philosophy through that design joint flexibility of precast structures and design the cross section based on efficiency of material used.
C313.4	Familiarize about various types of joints, Types of structural connections and Types of sealants in precast construction.
C313.5	Gain knowledge about structural stability, abnormal loads and Importance of avoidance of progressive collapse.

<b>CE3025: Airports and Harbours</b>	
C314.1	Gain an insight on the Air transport characteristics, classification planning and site selection for airport and its design.
C314.2	Know about classification of airport, Planning of Airfield Components Planning, Geometric design of various Airfield Components and drainage.
C314.3	Analyze and design the elements for orientation of runways and passenger facility systems and Air Traffic Control Tower.
C314.4	Understand the various features in Harbours and components Ports, their construction, coastal protection works.
C314.5	Familiarize on various Environmental Regulations and Acts, methods of impact analysis and its process.
<b>CCE334: Industrial Wastewater Management</b>	
C315.1	Explain the source and types of industrial wastewater and their environmental impacts and choose the regulatory laws pertaining to environmental protection
C315.2	Identify industrial wastewater pollution and implement methods for pollution prevention, waste minimization in industries
C315.3	Apply knowledge and skills to design various industrial wastewater treatment process and understand treatability studies.
C315.4	Audit and analyze environmental performance of industries to internal, external client, regulatory bodies and design water reuse management techniques
C315.5	Conduct research to develop effective management systems for industrial wastewater that are technically sound, economically feasible and socially acceptable.
<b>OCS352 : IOT Applications and Concepts</b>	
C316.1	Understand the fundamental concept of the Internet of Things (IoT), including its components and their roles in creating interconnected systems.
C316.2	Explore various communication models and protocols employed in IoT ecosystems to enable seamless data exchange and connectivity between devices.
C316.3	Design portable IoT systems by utilizing platforms like Arduino, Raspberry Pi, and other open-source tools, focusing on practical applications and functionality.
C316.4	Implement data analytics techniques and integrate cloud computing services in IoT systems to enhance data processing, storage, and remote access.
C316.5	Analyze real-time IoT applications across different industries and domains, understanding their impact and practical use cases.
<b>MX3089: Industrial Safety</b>	
C317.1	Understand the basic concept of safety.
C317.2	Obtain knowledge of Statutory Regulations and standards.
C317.3	Know about the safety Activities of the Working Place.
C317.4	Analyze on the impact of Occupational Exposures and their Remedies
C317.5	Obtain knowledge of Risk Assessment Techniques.

<b>CE3611: Building Drawing and Detailing Laboratory</b>	
C318.1	Draft the plan, elevation and sectional view of the load bearing and framed building using AutoCAD software
C318.2	Draw the structural detailing of RCC elements like slabs, beams and columns
C318.3	Draw the structural detailing of RCC water tanks, footings((isolated, stepped, combined) and retaining walls
C318.4	Draw the structural detailing of steel structures like beam to beam connections, beam to column connections.
C318.5	To draft the structural detailing of Industrial structures (truss and purlin)

## SEMESTER VII

<b>CE3701: Estimation, Costing and Valuation Engineering</b>	
C401.1	Understand the types and concepts of estimation of quantities for buildings, culverts, pavements and soak pits using different methods of estimation.
C401.2	Schedule of rates and analysis of rates for all building works, canals, roads along with the estimates of cost with given and available data (standard data and observed data)
C401.3	Gain knowledge on the specifications and its types, report preparation along with the types of tenders along with drafting procedure for the tenders.
C401.4	Develop knowledge on the types of contracts, BOT along with condition, formations and problems in contracts and also to know the MORTH Standard bidding documents.
C401.5	Evaluate the valuation of land using different valuation methods and to get know the depreciation, escalation and to calculate the mortgage and lease value of the property.
<b>AI3404: Hydrology and Water Resources Engineering</b>	
C402.1	Define the hydrological components and its behaviour. Apply different equipments and methodologies to measure the components to quantify for further usage.
C402.2	Understand the characteristics of catchments and factors affecting runoff, utilise the knowledge to estimate runoff using methods such as SCS-CN method and IUH.
C402.3	Define and explain the concept of hydrological extremes such as floods and droughts, its analysis, estimation and management techniques.
C402.4	Classify the types of reservoirs, analyse the site selection for reservoirs and explain the details about sedimentation and life of reservoirs.
C402.5	Apply the concepts of aquifers and its types and its functioning, the governing equations involved in it and design the rainwater harvesting systems in rural and urban areas.

<b>GE3791: Human Values and Ethics</b>	
C403.1	Explain the impact of the French Revolution, American Independence, and the Indian Freedom Movement on the development and implementation of democratic values.
C403.2	Apply secular principles to contemporary issues of religious tolerance and discrimination, proposing practical solutions based on secular values.
C403.3	Analyze the role of evidence-based approaches in validating facts and developing scientific knowledge.
C403.4	Assess the role of inclusive practices in promoting social equity, justice and promote gender equality.
C403.5	Propose ethical guidelines for responsible scientific research, innovation and frameworks for ensuring fairness and accountability in scientific advancements.
<b>GE3752: Total Quality Management</b>	
C404.1	Upon completion of the course, students will be able to have clear understanding of quality, its evolution, basic concepts, contribution of quality gurus, TQM framework, Barriers and Benefits of TQM
C404.2	Upon completion of the course, students will be able to understand the TQM Principles for application
C404.3	Students will be able to understand basics of Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA.
C404.4	Students will be able to Taguchi's Quality Loss Function, Performance Measures and apply Techniques like QFD, TPM, COQ and BPR
C404.5	Students will be able to apply QMS and EMS in any organization
<b>OCS351 : Artificial Intelligence and Machine Learning Fundamentals</b>	
C405.1	Apply the knowledge of mathematics, engineering fundamentals, problem solving approaches and various search techniques to build AI based applications.
C405.2	Understand the design and development of informed search techniques and solve the problems using advanced search techniques and CSP.
C405.3	Build and evaluate machine learning models, including regression and classification by using first principles of mathematics and engineering sciences.
C405.4	Develop and apply supervised learning techniques, including neural networks and decision trees using the knowledge of mathematics, science and engineering fundamentals to solve complex Problems
C405.5	Implement unsupervised learning techniques, including clustering and PCA to build a neural network model mathematics to design a solution for any complex engineering problem.
<b>OEN351 : Drinking Water Supply and Treatment</b>	
C406.1	Identify the sources of water and Comprehend the different elements of a water supply system and analyse the characteristics of water. Study the population growth, related water demand, design periods for water supply system.

C406.2	Organize the different elements of a water conveyance systems, design various parameters of collection and conveyance of water, intake structures, pumps and pipes.
C406.3	Develop analytical skills and design physical units of water treatment plant in Construction, Operation and Maintenance aspects.
C406.4	Identify the effective advanced water treatment units and design the Construction, Operation and its Maintenance aspects.
C406.5	Demonstrate the Principles, design of water supply in buildings and develop the water distribution network system.
<b>OPE353 : Industrial Safety</b>	
C407.1	To understand the introduction and basic terminologies safety like hazards, risks and important of personal protective equipment's in industries
C407.2	To enable the students to learn about the Important Statutory Regulations and standards followed by Indian Factories Act 1948
C407.3	To enable students to Conduct and participate the various Safety activities which should be followed in the Industries
C407.4	To have knowledge about workplace exposures and hazards in various types of industries and their safety precautions
C407.5	To assess the various hazards and consequences through various risk assessment techniques with effective manner

### SEMESTER VIII

<b>CE3811 : Project Work/Internship</b>	
C408.1	Gain knowledge of construction equipment's practices to be used in the field.
C408.2	Demonstrate knowledge of engineering techniques for effective project management and professional development to face emerging
C408.3	Apply the theoretical and practical aspects of project management techniques to achieve project goals