



# Kathir College of Engineering

[Approved by AICTE | Affiliated to Anna University | Accredited by NAAC]  
Wisdom Tree, Neelambur, Avinashi Road, Coimbatore-62

# CIVIL ENGINEERING



# Kathir College of Engineering

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 Wisdom Tree, Neelambur, Avinashi Road, Coimbatore-62

## Regulation– 2017 – UG

YEAR/SEMESTER : I/I	
<b>C101/HS8151- COMMUNICATIVE ENGLISH</b>	
<b>C101.1</b>	Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
<b>C101.2</b>	Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
<b>C101.3</b>	Read different genres of texts adopting various reading strategies.
<b>C101.4</b>	Listen/view and comprehend different spoken discourses/excerpts in different accents.
<b>C101.5</b>	Gaining capacity, skills enabling the students to write personal letters, official letters and E-mails in English effectively. Enabling students to enhance their conversational skills in spoken and written forms.
<b>C102/MA8151-ENGINEERING MATHEMATICS -I</b>	
<b>C102.1</b>	Have basic knowledge and understanding in one field of materials, integral and differential calculus.
<b>C102.2</b>	Utilize methods of integration to compute volumes of objects with circular shaped aspects, and compute lengths of curves.
<b>C102.3</b>	Read and understand problem descriptions, then be able to formulate equations modelling the problem usually by applying geometric or physical principles.
<b>C102.4</b>	Use integration to compute problems important in physics and engineering.
<b>C102.5</b>	Find the area of plane curves and volume of solids using double and triple integrals.
<b>C103/ PH8151 - ENGINEERING PHYSICS</b>	
<b>C103.1</b>	Have knowledge on the basics of physics related to properties of matter, optics, and acoustics.
<b>C103.2</b>	Apply these fundamental principles to solve practical problems related to materials used for engineering applications.
<b>C103.3</b>	Understand working principle of a LASER, components and working of different laser system and their engineering applications
<b>C103.4</b>	Understand the principle and working of particle detectors
<b>C103.5</b>	Examine the characteristics of laser and optical fiber.
<b>C104/ CY8151 ENGINEERING CHEMISTRY</b>	
<b>C104.1</b>	Apply this knowledge to the analysis and design of batteries.
<b>C104.2</b>	Phase rule concept is used to know the heat treatment process of alloy.



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<b>C104.3</b>	Know the properties of Lubricants
<b>C104.4</b>	The knowledge gained on polymer chemistry, thermodynamics, Spectroscopy, phase rule and nano materials will provide a strong platform to understand the concepts on these subjects for further learning.
<b>C104.5</b>	Outline the synthesis, characteristics and the applications of nano materials.
<b>C105/ GE8151- PROBLEM SOLVING AND PYTHON PROGRAMMING</b>	
<b>C105.1</b>	Develop algorithmic solutions to simple computational problems.
<b>C105.2</b>	Read, write, execute by hand simple Python programs.
<b>C105.3</b>	Structure simple Python programs for solving problems.
<b>C105.4</b>	Decompose a Python program into functions.
<b>C105.5</b>	Represent compound data using Python lists, tuples, dictionaries. Read and write data from/to files in Python Programs.
<b>C106/ GE8152-ENGINEERING GRAPHICS</b>	
<b>C106.1</b>	Familiarize with the fundamentals and standards of Engineering graphics
<b>C106.2</b>	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
<b>C106.3</b>	Project orthographic projections of lines and plane surfaces.
<b>C106.4</b>	Draw projections and solids and development of surfaces.
<b>C106.5</b>	Visualize and to project isometric and perspective sections of simple solids.
<b>C107/ GE8161-PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY</b>	
<b>C107.1</b>	Write, test, and debug simple Python programs.
<b>C107.2</b>	Implement Python programs with conditionals and loops.
<b>C107.3</b>	Develop Python programs step-wise by defining functions and calling them.
<b>C107.4</b>	Use Python lists, tuples, dictionaries for representing compound data.
<b>C107.5</b>	Read and write data from/to files in Python.
<b>C108/ BS8161 - PHYSICS AND CHEMISTRY LABORATORY</b>	
<b>C108.1</b>	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related to parameters.
<b>C108.2</b>	To determine the amount of metal ions through volumetric and spectroscopic techniques
<b>C108.3</b>	To analyze and determine the composition of alloys
<b>C108.4</b>	To analyze the impurities in solution by electroanalytical techniques



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<b>YEAR/SEMESTER : I/II</b>	
<b>C201/HS8251-TECHNICAL ENGLISH</b>	
<b>C201.1</b>	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
<b>C201.2</b>	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
<b>C201.3</b>	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
<b>C201.4</b>	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.
<b>C201.5</b>	Enhancing student's skills in report writing, job application, paragraph writing and other forms of writing skills.
<b>C202/MA8251-ENGINEERING MATHEMATICS – II</b>	
<b>C202.1</b>	Develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions.
<b>C202.2</b>	Solve problems related to engineering applications by using these techniques.
<b>C202.3</b>	To have an ability of mathematical modelling of systems using differential equations and ability to solve the differential equations.
<b>C202.4</b>	Use Green's theorem to evaluate line integrals along simple closed contours on the plane and use Stokes' theorem to give a physical interpretation of the curl of a vector field.
<b>C202.5</b>	Expand functions of two variables as Taylor's and Laurent's series and evaluate contour integrals using Cauchy's formula.
<b>C203/ PH8201 - PHYSICS FOR CIVIL ENGINEERING</b>	
<b>C203.1</b>	Gain knowledge on the thermal performance of buildings
<b>C203.2</b>	Acquire knowledge on the acoustic properties of buildings
<b>C203.3</b>	Apply the concepts of various lighting designs for buildings
<b>C203.4</b>	Analyze the properties and performance of modern engineering materials
<b>C203.5</b>	Describe basic concepts and estimation techniques for hazards of buildings
<b>C204/ BE8251- BASIC ELECTRICAL AND ELECTRONICS ENGINEERING</b>	
<b>C204.1</b>	Explain the basic theorems used in Electrical circuits
<b>C204.2</b>	Identify electrical components and functions of electrical machines



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<b>C204.3</b>	Apply the fundamentals of semiconductor devices
<b>C204.4</b>	Understand the principles of digital electronics
<b>C204.5</b>	Gain knowledge in fundamentals of communication engineering
<b>C205/ GE8291-ENVIRONMENTAL SCIENCE AND ENGINEERING</b>	
<b>C205.1</b>	Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection.
<b>C205.2</b>	Public awareness of environmental is at infant stage
<b>C205.3</b>	Ignorance and incomplete knowledge has lead to misconceptions
<b>C205.4</b>	Development and improvement in std. of living has lead to serious environmental disasters
<b>C206/ GE8292- ENGINEERING MECHANICS</b>	
<b>C206.1</b>	Illustrate the vectorial and scalar representation of forces and moments
<b>C206.2</b>	Analyze the rigid body in equilibrium
<b>C206.3</b>	Evaluate the properties of surfaces and solids
<b>C206.4</b>	Calculate dynamic forces exerted in rigid body
<b>C206.5</b>	Determine the friction and the effects by the laws of friction
<b>C207/ GE8261- ENGINEERING PRACTICES LABORATORY</b>	
<b>C207.1</b>	Fabricate carpentry components and pipe connections including plumbing works.
<b>C207.2</b>	Apply welding equipments to join the structures.
<b>C207.3</b>	Carry out the basic machining operation
<b>C207.4</b>	Make the models using sheet metal works
<b>C207.5</b>	Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
<b>C207.6</b>	Carry out basic home electrical works and appliances
<b>C207.7</b>	Measure the electrical quantities
<b>C207.8</b>	Elaborate on the components, gates, soldering practices.
<b>C208/ CE8211- COMPUTER AIDED BUILDING DRAWING</b>	
<b>C208.1</b>	Apply the principles of planning, orientation of buildings



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<b>C208.2</b>	Draw the plan, elevation and sectional views of buildings with load bearing walls
<b>C208.3</b>	Draw the plan, elevation and sectional views of buildings with sloping roof
<b>C208.4</b>	Draw the plan, elevation and sectional views of RCC framed structures
<b>C208.5</b>	Draw the plan, elevation and sectional views of industrial structures
<b>YEAR/SEMESTER : II/III</b>	
<b>C301/MA8353-TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS</b>	
<b>C301.1</b>	Analyze Partial Differential Equations in various methods.
<b>C301.2</b>	Solving Fourier Series for different types of functions.
<b>C301.3</b>	Computing the solutions of the heat equation, wave equation and the Laplace equation subject to boundary conditions
<b>C301.4</b>	Deduce the Gaussian function in Self reciprocal form using Fourier Transforms.
<b>C301.5</b>	Formation of finite difference method in Z-transforms.
<b>C302/ CE8301 STRENGTH OF MATERIALS I</b>	
<b>C302.1</b>	Understand the concepts of stress and strain, principal stresses and principal planes
<b>C302.2</b>	Determine Shear force and bending moment in beams and understand concept of theory of simple bending
<b>C302.3</b>	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection
<b>C302.4</b>	Apply basic equation of torsion in design of circular shafts and helical springs
<b>C302.5</b>	Analyze the pin jointed plane and space trusses
<b>C303/CE8302 - FLUID MECHANICS</b>	
<b>C303.1</b>	Get a basic knowledge of fluids in static, kinematic and dynamic equilibrium
<b>C303.2</b>	Understand and solve the problems related to equation of motion
<b>C303.3</b>	Gain knowledge about dimensional and model analysis
<b>C303.4</b>	Learn types of flow and losses of flow in pipes
<b>C303.5</b>	Understand and solve the boundary layer problems
<b>C304/CE8351 SURVEYING</b>	
<b>C304.1</b>	Understand the use of various surveying instruments and mapping



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<b>C304.2</b>	Measure Horizontal angle and vertical angle using different instruments
<b>C304.3</b>	Analyze methods of Leveling and setting Levels with different instruments
<b>C304.4</b>	Understand concepts of astronomical surveying and methods to determine time, longitude, latitude, and azimuth
<b>C304.5</b>	Apply Concept and principle of modern surveying
<b>C305/CE8391 CONSTRUCTION MATERIALS</b>	
<b>C305.1</b>	Compare the properties of most common and advanced building materials
<b>C305.2</b>	Understand the typical and potential applications of lime, cement and aggregates
<b>C305.3</b>	Know the production of concrete and also the method of placing and making of concrete elements
<b>C305.4</b>	Understand the applications of timbers and other materials
<b>C305.5</b>	Analyze the importance of modern material for construction
<b>C306/CE8392 ENGINEERING GEOLOGY</b>	
<b>C306.1</b>	Understand the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies
<b>C306.2</b>	Get basic knowledge on properties of minerals
<b>C306.3</b>	Understand the methods of study on geological structure
<b>C306.4</b>	Gain knowledge about types of rocks, their distribution and uses
<b>C306.5</b>	Analyze the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor
<b>C307/CE8311 Construction Materials Laboratory</b>	
<b>C307.1</b>	Understand the behavior of Fine Aggregates
<b>C307.2</b>	Understand the behavior of Coarse Aggregates
<b>C307.3</b>	Analyze the behavior of Concrete
<b>C307.4</b>	Understand the behavior of Bricks and Blocks
<b>C307.5</b>	Gain Knowledge in testing of construction materials and components of construction elements experimentally



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<b>C308/ CE8361 SURVEYING LABORATORY</b>	
<b>C308.1</b>	Study of chains and its accessories, Aligning, Ranging, Chaining and Marking Perpendicular offset
<b>C308.2</b>	Acquire practical knowledge on handling basic survey instruments including Tachometry, Theodolite
<b>C308.3</b>	Acquire practical knowledge on handling modern survey instruments including Total station, GPS
<b>C308.4</b>	Gain adequate knowledge in Triangulation and Astronomical surveying.
<b>C308.5</b>	Acquire knowledge about Survey field techniques
<b>C309/HS8381-INTERPERSONAL SKILLS / LISTENING &amp; SPEAKING</b>	
<b>C309.1</b>	Take international examination such as IELTS and TOEFL
<b>C309.2</b>	Participate in Group Discussion.
<b>C309.3</b>	Successfully answer questions in Interviews.
<b>C309.4</b>	Make effective Presentations.
<b>C309.5</b>	Participate confidently and appropriately in conversations both formal and informal
<b>YEAR/SEMESTER : II/IV</b>	
<b>C401/MA8491 NUMERICAL METHODS</b>	
<b>C401.1</b>	Understand the basic concepts and techniques of solving algebraic and transcendental equations.
<b>C401.2</b>	Appreciate the numerical techniques of interpolation and error approximations in various intervals in real life situations.
<b>C401.3</b>	Apply the numerical techniques of differentiation and integration for engineering problems.



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<b>C401.4</b>	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
<b>C401.5</b>	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
<b>C402/CE8401 CONSTRUCTION TECHNIQUES AND PRACTICES</b>	
<b>C402.1</b>	Know the different construction techniques and structural systems
<b>C402.2</b>	Understand various techniques and practices on masonry construction, flooring, and roofing
<b>C402.3</b>	Plan the requirements for substructure construction
<b>C402.4</b>	Know the methods and techniques involved in the construction of various types of super structures
<b>C402.5</b>	Select, maintain and operate hand and power tools and equipment used in the building construction sites
<b>C403/CE8402 STRENGTH OF MATERIALS II</b>	
<b>C403.1</b>	Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles
<b>C403.2</b>	Analyze propped cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements
<b>C403.3</b>	Find the load carrying capacity of columns and stresses induced in columns and cylinders
<b>C403.4</b>	Determine principal stresses and planes for an element in three-dimensional state of stress and study various theories of failure
<b>C403.5</b>	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and find the stresses in curved beam
<b>C404/CE8403 APPLIED HYDRAULIC ENGINEERING</b>	
<b>C404.1</b>	Apply their knowledge of fluid mechanics in addressing problems in open channels
<b>C404.2</b>	Able to identify an effective section for flow in different cross sections
<b>C404.3</b>	To solve problems in uniform, gradually and rapidly varied flows in steady state conditions
<b>C404.4</b>	Understand the principles, working and application of turbines



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<b>C404.5</b>	Understand the principles, working and application of pumps
<b>C405/ CE8404 CONCRETE TECHNOLOGY</b>	
<b>C405.1</b>	Understand various requirements of cement, aggregates and water for making concrete
<b>C405.2</b>	Analyze effect of admixtures on properties of concrete
<b>C405.3</b>	Apply concept and procedure of mix design as per IS method
<b>C405.4</b>	Apply properties of concrete at fresh and hardened state
<b>C405.5</b>	Gain knowledge on importance and application of special concretes
<b>C406/CE8491 SOIL MECHANICS</b>	
<b>C406.1</b>	Classify the soil and assess the engineering properties, based on index properties
<b>C406.2</b>	Understand the stress concepts in soils
<b>C406.3</b>	Understand and identify the settlement in soils
<b>C406.4</b>	Determine the shear strength of soil
<b>C406.5</b>	Analyze both finite and infinite slopes
<b>C407/CE8481 STRENGTH OF MATERIALS LABORATORY</b>	
<b>C407.1</b>	Study the action of various forces and determination of their characteristics experimentally
<b>C407.2</b>	Gain knowledge in the area of testing on steel rod
<b>C407.3</b>	Acquire Knowledge in the area of testing on wood
<b>C407.4</b>	Apply the procedures in the area of testing on metal



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<b>C407.5</b>	Apply the techniques in the area of testing on spring
<b>C408/ CE8461 HYDRAULIC ENGINEERING LABORATORY</b>	
<b>C408.1</b>	Measure flow in pipes and determine frictional losses
<b>C408.2</b>	Develop characteristics of pumps and turbines
<b>C408.3</b>	Verify the principles studied in theory by performing Flow Measurement
<b>C408.4</b>	Verify the principles studied in theory by performing Losses in Pipes
<b>C408.5</b>	Verify the principles studied in theory by Determination of Metacentric height
<b>C409/HS8461-ADVANCED READING AND WRITING</b>	
<b>C409.1</b>	Make effective Presentations.
<b>C409.2</b>	Participate in Group Discussion.
<b>C409.3</b>	Successfully answer questions in Interviews.
<b>C409.4</b>	Take international examination such as IELTS and TOEFL
<b>C409.5</b>	Participate confidently and appropriately in conversations both formal and informal
<b>YEAR/SEMESTER : III/V</b>	
<b>C501/ CE8501 DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS</b>	
<b>C501.1</b>	Understand the various design methodologies for the design of RC elements
<b>C501.2</b>	Know the analysis and design of flanged beams by limit state method sign of beams for shear, bond and torsion
<b>C501.3</b>	Design the various types of slabs and staircase by limit state method
<b>C501.4</b>	Design columns for axial, uniaxial and biaxial eccentric loadings
<b>C501.5</b>	Design footing by limit state method



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<b>C502/CE8502 STRUCTURAL ANALYSIS I</b>	
<b>C502.1</b>	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
<b>C502.2</b>	Analyze the continuous beams and rigid frames by slope deflection method
<b>C502.3</b>	Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway
<b>C502.4</b>	Analyze the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method
<b>C502.5</b>	Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames
<b>C503/EN8491 WATER SUPPLY ENGINEERING</b>	
<b>C503.1</b>	Gain insight into the structure of drinking water supply systems, including water transport, treatment and distribution
<b>C503.2</b>	Acquire knowledge in various unit operations and processes in water treatment
<b>C503.3</b>	Design the various functional units in water treatment
<b>C503.4</b>	Understand water quality criteria and standards, and their relation to public health
<b>C503.5</b>	Design and evaluate water supply project alternatives on basis of chosen criteria
<b>C504/CE8591 FOUNDATION ENGINEERING</b>	
<b>C504.1</b>	Understand the site investigation, methods and sampling
<b>C504.2</b>	Gain knowledge on bearing capacity and testing methods
<b>C504.3</b>	Design shallow footings
<b>C504.4</b>	Determine the load carrying capacity, settlement of pile foundation
<b>C504.5</b>	Determine the earth pressure on retaining walls and analysis for stability



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<b>C505/ GI8013- ADVANCED SURVEYING (Professional Elective-1)</b>	
<b>C505.1</b>	Gain knowledge on astronomical surveying
<b>C505.2</b>	Perform photogrammetric surveying and interpretation
<b>C505.3</b>	Solve the field problems with Total station
<b>C505.4</b>	Acquire knowledge on GPS surveying and the data processing
<b>C505.5</b>	Understand the route surveys and tunnel alignments
<b>C506/ORO551-RENEWABLE ENERGY SOURCES (Open Elective I*)</b>	
<b>C506.1</b>	Explain the physics of solar radiation
<b>C506.2</b>	Discuss the classification of solar energy collectors and methodologies of storing solar energy
<b>C506.3</b>	Illustrate the concepts of solar energy utilization in a useful way and applications of solar energy
<b>C506.4</b>	Describe the concepts in wind energy and biomass with its economic aspects
<b>C506.5</b>	Analyze in capturing and applying other forms of energy sources like geothermal, Wave, Tidal, OTEC, mini-hydel energies
<b>C507/CE8511 SOIL MECHANICS LABORATORY</b>	
<b>C507.1</b>	Develop skills to test the soils for their index and engineering properties and to characterize the soil based on their properties
<b>C507.2</b>	Develop skills to test the soils for determination of Index Properties
<b>C507.3</b>	Develop skills to test the soils for determination of in-situ density and compaction characteristics
<b>C507.4</b>	Develop skills to test the soils for determination of engineering properties
<b>C507.5</b>	Conduct tests to determine both the index and engineering properties of soils and to characterize the soil based on their properties



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<b>C508/CE8512 WATER AND WASTE WATER ANALYSIS LABORATORY</b>	
<b>C508.1</b>	Analyze the physical, chemical and biological characteristics of water and wastewater
<b>C508.2</b>	Quantify the dosage requirement for coagulation process
<b>C508.3</b>	Study the growth of micro-organism and its quantification
<b>C508.4</b>	Quantify the sludge
<b>C508.5</b>	Quantify the pollutant concentration in water and wastewater
<b>C509/CE8513 SURVEY CAMP</b>	
<b>C509.1</b>	Determine the area of traverse using Total station and GPS
<b>C509.2</b>	Plot contours and the undulating ground surface
<b>C509.3</b>	Perform highway alignment and set out curves for new roads
<b>C509.4</b>	Handle total station and do field observation using it
<b>C509.5</b>	Participate as a team and work with fellow mates in carrying out the surveying of Sun observation to determine azimuth
<b>YEAR/SEMESTER: III/VI</b>	
<b>C601/CE8601 DESIGN OF STEEL STRUCTURAL ELEMENTS</b>	
<b>C601.1</b>	Understand the concepts of various design philosophies
<b>C601.2</b>	Design common bolted and welded connections for steel structures
<b>C601.3</b>	Design tension members and understand the effect of shear lag
<b>C601.4</b>	Understand the design concept of axially loaded columns and column base connections
<b>C601.5</b>	Design laterally restrained and unrestrained steel beams
<b>C602/CE8602 STRUCTURAL ANALYSIS II</b>	
<b>C602.1</b>	Draw influence lines for statically determinate structures and calculate critical stress resultants
<b>C602.2</b>	Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams
<b>C602.3</b>	Analyze of three hinged, two hinged and fixed arches
<b>C602.4</b>	Analyze the suspension bridges with stiffening girders
<b>C602.5</b>	Understand the concept of Plastic analysis and the method of analyzing beams and rigid frames
<b>C603/CE8603 IRRIGATION ENGINEERING</b>	



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<b>C603.1</b>	Have knowledge and skills on crop water requirements
<b>C603.2</b>	Understand the methods and management of irrigation
<b>C603.3</b>	Gain knowledge on types of Impounding structures
<b>C603.4</b>	Understand methods of irrigation including canal irrigation
<b>C603.5</b>	Get knowledge on water management on optimization of water use
<b>C604/ CE8604 HIGHWAY ENGINEERING</b>	
<b>C604.1</b>	Get knowledge on planning and aligning of highway
<b>C604 .2</b>	Geometric design of highways
<b>C604 .3</b>	Design flexible and rigid pavements
<b>C604 .4</b>	Gain knowledge on Highway construction materials, properties, testing methods
<b>C604 .5</b>	Understand the concept of pavement management system, evaluation of distress and maintenance of pavements
<b>C605/EN8592 WASTE WATER ENGINEERING</b>	
<b>C605.1</b>	An ability to estimate sewage generation and design sewer system including sewage pumping stations
<b>C605.2</b>	The required understanding on the characteristics and composition of sewage, self-purification of streams
<b>C605.3</b>	An ability to perform basic design of the unit operations and processes that are used in sewage treatment
<b>C605.4</b>	Understand the standard methods for disposal of sewage
<b>C605.5</b>	Gain knowledge on sludge treatment and disposal
<b>C606/CE8001 GROUND IMPROVEMENT TECHNIQUES (Professional Elective-II)</b>	
<b>C606.1</b>	Gain knowledge on methods and selection of ground improvement techniques



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<b>C606.2</b>	Understand dewatering techniques and design for simple cases
<b>C606.3</b>	Get knowledge on in-situ treatment of cohesionless and cohesive soils
<b>C606.4</b>	Understand the concept of earth reinforcement and design of reinforced earth
<b>C606.5</b>	Get to know types of grouts and grouting technique
<b>C607/CE8611 HIGHWAY ENGINEERING LABORATORY</b>	
<b>C607.1</b>	learn the principles and procedures of testing of highway materials
<b>C607.2</b>	Techniques to characterize various test on aggregates
<b>C607.3</b>	Techniques to characterize various test on bitumen
<b>C607.4</b>	Techniques to characterize various tests on bituminous mixes
<b>C607.5</b>	Demonstration of any one field testing equipment like skid resistance tester/ Benkelman beam etc.
<b>C608/CE8612 IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING</b>	
<b>C608.1</b>	Conceive, design and draw the irrigation and environmental engineering structures in detail showing the plan, elevation and Sections
<b>C608.2</b>	Design and draw various units of Municipal water treatment plants
<b>C608.3</b>	Design and draw various units of sewage treatment plants
<b>C608.4</b>	Design principles irrigation engineering
<b>C608.5</b>	Design principles environmental engineering
<b>C609/HS8581-PROFESSIONAL COMMUNICATION</b>	
<b>C609.1</b>	Take international examination such as IELTS and TOEFL



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<b>C609.2</b>	Participate in Group Discussion.
<b>C609.3</b>	Successfully answer questions in Interviews.
<b>C609.4</b>	Make effective Presentations.
<b>C609.5</b>	Participate confidently and appropriately in conversations both formal and informal.
<b>YEAR/SEMESTER : IV/VII</b>	
<b>C701/CE8701 ESTIMATION,COSTING AND VALUATION ENGINEERING</b>	
<b>C701.1</b>	Estimate the quantities for buildings
<b>C701.2</b>	Rate Analysis for all Building works, canals, and Roads and Cost Estimate
<b>C701.3</b>	Understand types of specifications, principles for report preparation, tender notices types
<b>C701.4</b>	Gain knowledge on types of contracts
<b>C701.5</b>	Evaluate valuation for building and land
<b>C702/CE8702 RAILWAYS, AIRPORTS, DOCKS AND HARBOR ENGINEERING</b>	
<b>C702.1</b>	Understand the methods of route alignment and design elements in Railway Planning and Constructions
<b>C702.2</b>	Understand the Construction techniques and Maintenance of Track laying and Railway stations
<b>C702.3</b>	Gain an insight on the planning and site selection of Airport Planning and design
<b>C702.4</b>	Analyze and design the elements for orientation of runways and passenger facility systems
<b>C702.5</b>	Understand the various features in Harbors and Ports, their construction, coastal protection works and coastal Regulations to be adopted
<b>C703/CE8703 STRUCTURAL DESIGN AND DRAWING</b>	
<b>C703.1</b>	Design and draw reinforced concrete cantilever and counterfort retaining walls
<b>C703.2</b>	Design and draw flat slab as per code provisions
<b>C703.3</b>	Design and draw reinforced concrete and steel bridges
<b>C703.4</b>	Design and draw reinforced concrete and steel water tanks



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<b>C703.5</b>	Design and detail the various steel trusses and gantry girders.
<b>C704/EN8592 MUNICIPAL SOLID WASTE MANAGEMENT (Professional Elective-III)</b>	
<b>C704.1</b>	Identify Sources and types of municipal solid wastes-waste generation rates-factors affecting generation
<b>C704.2</b>	Classify Methods of sampling and characterization and study the effects of improper disposal of solid wastes
<b>C704.3</b>	Evaluate the methods of Residential and commercial waste collection
<b>C704.4</b>	Gain knowledge in Physical Processing techniques and Resource recovery from solid waste
<b>C704.5</b>	Analyze the disposal options in municipal solid waste management
<b>C705/ OIE751 ROBOTICS (Open Elective-2)</b>	
<b>C705.1</b>	Explain the concepts of industrial robots, classification, specifications and coordinate systems. Also summarize the need and application of robots indifferent sectors
<b>C705.2</b>	Illustrate the different types of robot drive systems as well as robot end effectors
<b>C705.3</b>	Apply the different sensors and image processing techniques in robotics to improve the ability of robots
<b>C705.4</b>	Develop robotic programs for different tasks and familiarize with the kinematics motions of robot
<b>C705.5</b>	Examine the implementation of robots in various industrial sectors and interpolate the economic analysis of robots
<b>C706/ CE8711 CREATIVE AND INNOVATIVE PROJECT (Professional Elective-3)</b>	
<b>C706.1</b>	Acquire knowledge in Civil Engineering to do a mini project
<b>C706.2</b>	Familiarize with designs, fabrication or algorithms
<b>C706.3</b>	Design buildings expressing their ideas in a novel way
<b>C706.4</b>	Identify a topic of interest in their course of study



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<b>C706.5</b>	Carryout the design / fabrication or develop computer code.
<b>C707/CE8712 INDUSTRIAL TRAINING</b>	
<b>C707.1</b>	Train the students in field work so as to have a firsthand knowledge of practical problems in carrying out engineering tasks
<b>C707.2</b>	Develop skills in facing and solving the field problems
<b>C707.3</b>	Undertake training in reputed civil engineering companies for the specified duration
<b>C707.4</b>	Implement the intricacies of textbook knowledge into practice
<b>C707.5</b>	Apply the concepts of developments and implementation of new techniques



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<b>YEAR/SEMESTER : IV/VIII</b>	
<b>C801/GE8076 PROFESSIONAL ETHICS IN ENGINEERING (Professional Elective IV)</b>	
<b>C801.1</b>	Create an awareness on Engineering Ethics and Human Values
<b>C801.2</b>	Instill Moral and Social Values and Loyalty and to appreciate the rights of others
<b>C801.3</b>	Create Engineers as Expert Witnesses and Advisors
<b>C801.4</b>	Gain knowledge on Intellectual Property Rights (IPR) & Discrimination
<b>C801.5</b>	Apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society
<b>C802/CE8020 MAINTENANCE, REPAIR AND REHABILITATION OF STRUCTURES (Professional Elective- V)</b>	
<b>C802.1</b>	Understand importance of maintenance and assessment method of distressed structures
<b>C802.2</b>	Analyze the strength and durability properties, their effects due to climate and temperature
<b>C802.3</b>	Gain knowledge in recent development in concrete
<b>C802.4</b>	Assess the techniques for repair and protection methods
<b>C802.5</b>	Apply Repair, rehabilitation and retrofitting of structures and demolition methods
<b>C803/CE8811PROJECT WORK</b>	
<b>C803.1</b>	Identify a topic in advanced areas of Civil Engineering Identify methods and materials to carry out experiments/develop code
<b>C803.2</b>	Review literature to identify gaps and define objectives & scope of the work Reorganize the procedures with a concern for society, environment and ethics
<b>C803.3</b>	Generate and implement innovative ideas for social benefit Analyze and discuss the results to draw valid conclusions
<b>C803.4</b>	Develop a prototypes/models, experimental set-up and software systems necessary to meet the objectives Prepare a report as per recommended format and defend the work
<b>C803.5</b>	Explore the possibility of publishing papers in peer reviewed journals/conference proceedings