MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

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Email id: principal@msec.edu.in
Website: www.msec.edu.in
DEPARTMENT OF CIVIL ENGINEERING

REGULATION – 2021

COURSE OUTCOMES (CO)

MA3351 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS (C201)

C201.1	Understand how to solve the given standard partial differential equations
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations
C201.4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

ME3351 ENGINEERING MECHANICS (C202)

C202.1	Illustrate the vectorial 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

CE3301 FLUID MECHANICS (C203)

C203.1	Demonstrate the difference between solid and fluid, its properties and behaviour in static conditions
C203.2	Apply the conservation laws applicable to fluids and its application through fluid kinematics and dynamics
C203.3	Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performance of prototypes by model studies.
C203.4	Estimate the losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel.
C203.5	Explain the concept of boundary layer and its application to find the drag force excreted by the fluid on the flat solid surface.

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CE3302 CONSTRUCTION MATERIALS AND TECHNOLOGY (C204)

C204.1	Identify the good quality brick, stone and blocks for construction.
C204.2	Recognize the market forms of timber, steel, aluminum and applications of various composite materials.
C204.3	Identify the best construction and service practices such as thermal insulations and air conditioning of the building
C204.4	Select various equipment's for construction works conditioning of building
C204.5	Understand the construction planning and scheduling techniques

CE3303 WATER SUPPLY AND WASTEWATER ENGINEERING (C205)

C205.1	Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission
C205.2	Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations
C205.3	Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process
C205.4	Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.
C205.5	Able to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

CE3351 SURVEYING AND LEVELLING (C206)

C206.1	Introduce the rudiments of various surveying and its principles
C206.2	Imparts knowledge in computation of levels of terrain and ground features
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations
C206.4	Understand the procedure for establishing horizontal and vertical control
C206.5	Imparts the knowledge on modern surveying instruments

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CE3361 SURVEYING AND LEVELLING LABORATORY (C207)

C207.1	Impart knowledge on the usage of basic surveying instruments like chain/tape, compass and levelling instruments
C207.2	Able to use levelling instrument for surveying operations
C207.3	Able to use theodolite for various surveying operations
C207.4	Able to carry out necessary surveys for social infrastructures
C207.5	Able to prepare planimetric maps

CE3311 WATER AND WASTEWATER ANALYSIS LABORATORY (C208)

C208.1	Calibrate and standardize the equipment
C208.2	Collect proper sample for analysis
C208.3	To know the sample preservation methods
C208.4	To perform field oriented testing of water, wastewater
C208.5	To perform coliform analysis

GE3361 PROFESSIONAL DEVELOPMENT (C209)

C209.1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
C209.2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
C209.3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects

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CE3401 APPLIED HYDRAULICS ENGINEERING (C210)

C210.1	Describe the basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application
C210.2	Analyse steady gradually varied flow, water surface profiles and its length calculation using direct and standard step methods with change in water surface profiles due to change in grades
C210.3	Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges.
C210.4	Design turbines and explain the working principle
C210.5	Differentiate pumps and explain the working principle with characteristic curves and design centrifugal and reciprocating pumps.

CE3402 STRENGTH OF MATERIALS (C211)

C211.1	Understand the concepts of stress and strain, principal stresses and principal planes
C211.2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending.
C211.3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection
C211.4	Analyze propped cantilever, fixed beams and continuous beams for external loadings and support settlements.
C211.5	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and study the various theories of failure

CE3403 CONCRETE TECHNOLOGY (C212)

C212.1	Understand the requirements of cement, aggregates and water for concrete
C212.2	Select suitable admixtures for enhancing the properties of concrete
C212.3	Design concrete mixes as per IS method of mix design
C212.4	Determine the properties of concrete at fresh and hardened state
C212.5	Know the importance of special concretes for specific requirements

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CE3404 SOIL MECHANICS. (C213)

C213.1	Demonstrate an ability to identify various types of soils and its properties, formulate and solve engineering Problems
C213.2	Show the basic understanding of flow through soil medium and its impact of engineering solutior
C213.3	Understand the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation
C213.4	Show the understanding of shear strength of soils and its impact of engineering solutions to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils.
C213.5	Demonstrate an ability to design both finite and infinite slopes, component and process as per needs and specifications.

CE3405 HIGHWAY AND RAILWAY ENGINEERING (C214)

C214.1	Plan a highway according to the principles and standards adopted in various institutions in India
C214.2	Design the geometric features of road network and components of pavement.
C214.3	Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management.
C214.4	Understand the methods of route alignment and design elements in railway planning and constructions.
C214.5	Understand the construction techniques and maintenance of track laying and railway stations

GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY (C215)

C215.1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation
C215.2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
C215.3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
C215.4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
C215.5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

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CE3411 HYDRAULIC ENGINEERING LABORATORY (C216)

C216.1	Apply Bernoulli equation for calibration of flow measuring devices.
C216.2	Measure friction factor in pipes and compare with Moody diagram.
C216.3	Determine the performance characteristics of rotodynamic pumps
C216.4	Determine the performance characteristics of positive displacement pumps.
C216.5	Determine the performance characteristics of turbines

CE3412 MATERIALS TESTING LABORATORY (C217)

C217.1	Determine the mechanical properties of steel.
C217.2	Determine the physical properties of cement
C217.3	Determine the physical properties of fine and coarse aggregate
C217.4	Determine the workability and compressive strength of concrete
C217.5	Determine the strength of brick and wood.

CE3413 SOIL MECHANICS LABORATORY (C218)

C218.1	Conduct tests to determine the index properties of soils
C218.2	Determine the insitu density and compaction characteristics
C218.3	Conduct tests to determine the compressibility, permeability and shear strength of soils
C218.4	Understand the various tests on Geosynthetics.

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CE3501 DESIGN OF REINFORCED CONCRETE STRUCTURAL ELEMENTS (C301)

C301.1	Know the various design concepts and design RC rectangular beams by working stress and limit state methods
C301.2	Understand the design of flanged beams, design for shear and torsion, and anchorage and development length
C301.3	Design a RC slabs and staircase and draw the reinforcement detailing
C301.4	Design short columns for axial, uni-axial and bi-axial eccentric loadings
C301.5	Design wall footings, isolated footings and combined rectangular footing.

CE3502 STRUCTURAL ANALYSIS I (C302)

C302.1	Analyze the pin-jointed plane and space frames
C302.2	Analyse the continuous beams and rigid frames by slope defection 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)

C303.1	Ability to plan and execute a detailed site investigation to select geotechnical design parameters and type of foundation.
C303.2	Design shallow foundations, its component or process as per the needs and specifications.
C303.3	Design combined footings and raft foundations, its component or process as per the needs and specifications
C303.4	Demonstrate an ability to design deep foundations, its component or process as per the needs and specifications.
C303.5	Acquire knowledge on retaining walls, its component or process as per the needs and specifications.

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CE3511 HIGHWAY ENGINEERING LABORATORY (C304)

C304.1	Characterize Pavement Aggregate through relevant test.
C304.2	Ascertain the Quality of Bitumen
C304.3	Determine the Optimum Binder Content Using Marshall Method
C304.4	Evaluate the Consistency and Properties of Bitumen
C304.5	Determine the Bitumen Content in the Bituminous Mixes

CE3512 SURVEY CAMP (C305)

C305.1	Handle the modern surveying instruments like Total station and GPS
C305.2	Apply modern surveying techniques in field to establish horizontal control.
C305.3	Understand the surveying techniques in field to establish vertical control.
C305.4	Apply different survey adjustment techniques
C305.5	Carry out different setting out works in the field

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