Mahatma Gandhi Mission's
College of Engineering and Technology
(Affiliated to University of Mumbai and Approved by, AICTE, New Delhi.)
Plot No. 1, 2, Sion - Panvel Expressway, Sector 18, Kamothe, Navi Mumbai, Maharashtra
410209 Website : www.mgmmumbai.ac.in

DEPARTMENT OF CIVIL ENGINEERING

Program Outcomes (PO)	
PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem Analysis: identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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DEPARTMENT OF CIVIL ENGINEERING

Program Specific Outcomes (PO)	
PSO1	To impart technical knowledge and competency skills to perform in various areas like sales & marketing, product engineering, research & development, hospital administration, regulatory affairs and also to venture into entrepreneurship.
PSO2	Develop proficiency in various soft skills and bring awareness about social obligations and professional ethics to pursue professional career in a healthcare industry.
PSO3	Motivate to pursue research and specialization in a plethora of domains in the field of Biomedical Engineering covering disciplines such as, Medical Instrumentation, Neuroscience, Computational Engineering, Robotics Engineering, Medical Signal and Image processing, Rehabilitation Engineering, VLSI, Nanotechnology and Biosensors, etc.

MGMCET NAVI MUMBAI

CIVIL DEPARTMENT2023-2024

CE-C 301 - Applied Mathematics - III

Name of the Course	CO Code	Course Outcome (CO)
Applied Mathematics - III	CEC 301.1	Solve the Ordinary and Partial Differential Equations using Laplace Transformation.
	CEC 301.2	Solve Ordinary and Partial Differential Equations using Fourier series
	CEC 301.3	Solve initial and boundary value problems involving ordinary differential equations
	CEC 301.4	Fit the curve using concept of correlation and regression
	CEC 301.5	Apply bilinear transformations and conformal mappings
	CEC 301.5	Identify the applicability of theorems and evaluate the contour integrals.

CE-C 302 Surveying- I

Name of the Course	CO Code	Course Outcome (CO)
Surveying - I	CE-C 302 .1	Apply principles of surveying and leveling for civil engineering works
	CE-C 302 .2	Measure vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems
	CE-C 302.3	Perform various practical and hence projects using different surveying instruments.

	CE-C 302 .4	Apply geometric principles for computing data and drawing plans and sections
	CE-C 302 .5	Analyze the obtained spatial data and compute areas and volumes and represent 3D data on plane surfaces (2D) as contours

CE-C 304 Engineering Geology

Name of the Course	CO Code	Course Outcome (CO)
Engineering Geology	CE-C 304.1	Understand the significance of geological studies for safe, stable and economic design of any civil engineering structure
	CE-C 304.2	Demonstrate the knowledge of geology to explain major geological processes such as formation of mountain, ocean and the occurrence and distribution of earthquakes and volcanoes
	CE-C 304.3	Explain various geological structures like folds, faults, joints, unconformity, their origin and distribution which are very essential in the design and construction of dams, tunnels and any other major civil engineering project.
	CE-C 304.4	Understand methods of surface and subsurface investigation, advantages and disadvantages caused due to geological conditions during the construction of dam and tunnel.
	CE-C 304.5	Understand the causes and prevention of natural hazard like earthquake, landslide, volcano etc. will help student to meet the specific needs with suitable considerations for public health and safety.
	CE-C 304.6	Prepare effective reports mentioning advantages and disadvantages caused due to geological condition and can evaluate any site for civil engineering project

CE-C 305 Fluid Mechanics- I

Name of the Course	CO Code	Course Outcome (CO)
Fluid Mechanics- I	CEC 305.1	Define various properties of fluids, state and explain different types of laws and principles of fluid mechanics.
	CEC 305.2	Interpret different forms of pressure measurement and Calculate Hydrostatic Force and its Location for a given geometry and orientation of plane surface
	CEC 305.3	Compute force of buoyancy on a partially or fully submerged body and analyse the stability of a floating body
	CEC 305.4	Distinguish velocity potential function and stream function and solve for velocity and acceleration of a fluid at a given location in a fluid flow.

	CEC 305.5	Derive Euler's Equation of motion and Deduce Bernoulli's equation.
	CEC 305.6	Measure velocity and rate of flow using various devices

CE-C 401Applied Mathematics -IV

Name of the Course	CO Code	Course Outcome (CO)
Applied Mathematics -IV	CEC 401.1	Solve the system of linear equations using matrix algebra with its specific rules
	CEC 401.2	Illustrate basics of vector calculus
	CEC 401.3	Apply the concept of probability distribution and sampling theory to engineering problems
	CEC 401.4	Apply the concept of probability distribution and sampling theory to engineering problems.
	CEC 401.5	Apply principles of vector calculus to the analysis of engineering problems
	CEC 401.6	Identify, formulate and solve engineering problems
	CEC 401.7	Illustrate basic theory of correlations and regression

CE-C 402 Surveying - II

Name of the Course	CO Code	Course Outcome (CO)
Surveying - II	CEC 402.1	Operate Total Station & GPS for desired accuracy in surveying and establish survey control of determined accuracy using Total Station, GPS, GIS and remote sensing.
	CEC 402.2	Set out various types of curves by linear and angular methods
	CEC 402.3	Compute setting out data from survey and design information.
	CEC 402.4	Generate and manipulate field survey data and incorporate design data using specialised software's.
	CEC 402.5	Appreciate the role of various governmental authorities in maintaining cadastral survey records.

CEC 403 Structural Analysis- I

Name of the Course	CO Code	Course Outcome (CO)
Structural Analysis - I	CEC 403.1	Understand the behavior of various statically determinate structures including compound structures having an internal hinge for various loadings.

	CEC 403.2	The knowledge gained in this subject shall also be useful for application in the structural design in later years
	CEC 403.3	Analyze these structures to find out the internal forces such as axial force, shear force, bending moment, twisting moments, etc
	CEC 403.4	Evaluate the displacements / deflections in beams and frames under the action of loads
	CEC 403.5	They will be able to obtain the response of the beams under the action of moving loads.
	CEC 403.6	Analyze the structures such as arches and suspension bridges and study the behavior of eccentrically loaded columns.
	CEC 403.7	Analyze the section with respect to unsymmetrical bending and shear center
	CEC 403.8	Demonstrate the ability to extend the knowledge gained in this subject in the subjects Structural Analysis-II and elective subjects such as Advanced Structural Analysis and Advanced Structural Mechanics in the higher years of their UG programme where they will be dealing with the indeterminate structures.

CE-C 404 Building Design and Drawing

Name of the Course	CO Code	Course Outcome (CO)
Building Design and Drawing	CEC 404.1	Students will be able to list down the types of structures and its various components (for eg. doors, windows, staircase, foundations etc Students will be able to calculate and analyze various technical details of a building (for eg. carpet area, FSI etc.) from its drawings.
	CEC 404.2	Students will be able to explain various concepts pertaining to building design and drawing (for eg principles of planning, architectural planning, green buildings etc.)
	CEC 404.3	Students will be able to apply principles of planning, architectural planning and building bye laws while designing and preparing building drawings.
	CEC 404.4	Students will be able to design various components of buildings (for eg. staircases etc.) as well as buildings as a whole, given the requirements of the building owner and local D.C. laws.
	CEC 404.5	Students will be able to prepare drawings (for eg. plans, elevation, perspective views etc.) of the designed components of buildings as well as buildings as a whole

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CE-C 405 Building Materials and Construction Technology

Name of the Course	CO Code	Course Outcome (CO)
Building Materials and Construction Technology	CEC 405.1	Identify and list the various building materials, their properties and symbols
	CEC 405.2	Identify the properties of ingredients of concrete, interpret and design concrete mix for various grades
	CEC 405.3	Explain and interpret manufacturing process of basic construction materials and understand various masonry construction and finishes.
	CEC 405.4	Perform tests on various materials

CEC 406 Fluid Mechanics - II

Name of the Course	CO Code	Course Outcome (CO)
Fluid Mechanics - II	CEC 406.1	On completion of this course the student will be able to: Interpret different pipe fittings and evaluate the fluid velocity considering major and minor losses.
	CEC 406.2	Solve pipe network problems by Hardy cross method
	CEC 406.3	Distinguish the types of compressible flow and understand concept of boundary layer theory
	CEC 406.4	Evaluate pressure drop in pipe flow using Hagen-Poiseuille's equation for laminar flow in a pipe.
	CEC 406.5	Establish Prandtl's mixing theory and solve turbulent flow problems

CE – C501 Structural Analysis –II

Name of the Course	CO Code	Course Outcome (CO)
Structural Analysis –II	CE – C501.1	To revise the various concepts involved in the analyses of the structures studied in the subject Structural Analysis-I.
	CE – C501.2	To analyze the statically determinate structures with reference to the variation in the temperature.
	CE – C501.3	To understand the concept of static and kinematic indeterminacy (degrees of freedom) of the structures such as beams rigid pin jointed frames.
	CE – C501.4	To understand the concepts/ broad methods, sub-methods involved in the analysis of indeterminate structures.
	CE – C501.5	To apply these methods for analyzing the indeterminate structures to evaluate the response of such structures in the form of bending moment, shear force, axial force etc.
	CE – C501.6	To study the analyses of two hinged arches.

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CE-C502 Geotechnical Engineering -I

Name of the Course	CO Code	Course Outcome (CO)
Geotechnical Engineering -I	CE-C502.1	To study the composition, types relationships involving weight, volume weight-volume of soil.
	CE-C502.2	To study the index properties of soil that is indicative of the engineering properties.
	CE-C502.3	To characterize the soil based on size, shape, index properties plasticity.
	CE-C502.4	To classify the soil based on different classification systems.
	CE-C502.5	To study the properties of soil related to flow of water
	CE-C502.6	To understand the concept of total stress, effective stress pore water pressure in soil.
	CE-C502.7	To understand the load-deformation process in soils through compaction consolidation.
	CE-C502.8	To study the shear strength of soil.
	CE-C502.9	To understand the techniques of site exploration, assessing the subsoil conditions the engineering properties of the various strata method of reporting.

CE- 503-Building Design & Drawing – II

Name of the Course	CO Code	Course Outcome (CO)
Building Design & Drawing – II	CE- 503.1	To understand the Planning concepts, rules, regulations, various bye-laws of local administration/authorities with reference to all types of public buildings.
	CE- 503.2	To understand the application of bye-laws in Planning, Designing Drawing of all types of public buildings.
	CE- 503.3	To understand all the concepts involved in drawing the different Perspective drawings for public buildings, workshops.
	CE- 503.4	To prepare various types of drawings for the public building structures planned designed, satisfying the functional market requirements.
	CE- 503.5	To study & apply the provisions made in the relevant Indian Specifications pertaining to the practice for public buildings, the society needs for over all development.

CE-C504-Applied Hydraulics – I

Name of the Course	CO Code	Course Outcome (CO)
Applied Hydraulics – I	CE-C504.1	To study hydraulic machines like centrifugal pumps, reciprocating pumps and turbines.
	CE-C504.2	To study devices based on the principals of fluid statics fluid kinematics

	CE-C504.3	To study the mathematical technique used in research work for design for conducting model tests.
	CE-C504.4	To impart the dynamic behavior of the fluid flow analyzed by the Newton's second law of motion.

CE-C505- Transportation Engineering – I

Name of the Course	CO Code	Course Outcome (CO)
Transportation Engineering – I	CE-C505.1	Understand the knowledge of various systems of railway, airport, water transportation.
	CE-C505.2	Understand the design concept of railway track, runway, taxiways, etc.
	CE-C505.3	Apply the concept of geometric design of railway track, runway, taxiway, etc.
	CE-C505.4	Apply the knowledge of various signalling system for railway engineering, air traffic control, navigational aids.
	CE-C505.5	Understand the concepts of bridge engineering including site selection for the bridges, different types of bridges in the classified manner, bridge hydrology, and various components of the bridge structures.

CE-C502 Geotechnical Engineering –I Lab

Name of the Course	Code	Course Outcome (CO)
Geotechnical Engineering –I Lab	CE-C502.1	To Determine moisture content of soil
	CE-C502.2	To Determine the Field density of soils by sand replacement and corecutter method
	CE-C502.3	To determine the grading curve for soil by sieve analysis
	CE-C502.4	To determine the specific gravity of soil by pycnometer
	CE-C502.5	To determine the Atterberg's limits by laboratory methods
	CE-C502.6	To determine the Permeability of soil by laboratory tests
	CE-C502.7	To determine the Optimum moisture content of soil

CE- 503-Building Design & Drawing – II Lab

Name of the Course	CO Code	Course Outcome (CO)
Building Design & Drawing – II Lab	CE- 503.1	To understand principles of planning, designing of public building
	CE- 503.2	To plan the public building according to required design and application of bylaws
	CE- 503.3	To understand the different local authorities for the architectural drawing

	CE- 503.4	To prepare different types of drawing showing complete details with respective public building

CE-C504-Applied Hydraulics – I Lab

Name of the Course	CO Code	Course Outcome (CO)
Applied Hydraulics – I Lab	CE-C504.1	To study the impact of jet (FLAT VANE)
	CE-C504.2	To study the impact of jet (HEMISPHERICAL VANE)
	CE-C504.3	To study the impact of jet (INCLINED VANE)
	CE-C504.4	Cenrifugal pump
	CE-C504.5	To study the Pelton wheel turbine (FULL GATE OPEN)
	CE-C504.6	To study the Pelton wheel turbine (HALF GATE OPEN)

CE –C602-Design and Drawing of Steel Structure

Name of the Course	CO Code	Course Outcome (CO)
Design and Drawing of Steel Structure	CE – C 602.1	To understand the design concept of design of tension and compression member
	CE – C 602.2	To understand the design concept of laterally supported and unsupported beams
	CE – C 602.3	To understand the concept of plastic analysis of simple beam
	CE – C 602.4	To understand the design concept of welded plate girder

CE-C603- Applied Hydraulics – II

Name of the Course	CO Code	Course Outcome (CO)
Applied Hydraulics – II	CE-C603.1	To understand the flow phenomena (e.g. hydraulic jump, backwater waves, critical depth, etc) using experiments.
	CE-C603.2	Understand the impact of engineering solutions for boundary layer theory in the context of submerged bodies.
	CE-C603.3	Develop the understanding of the design and measurement of flow velocity in open channel.
	CE-C603.4	Understand the different slope profiles and its effect on the flow characteristics
	CE-C603.5	Study the specific energy it's applications

CE-C604-Transportation Engineering. – II

Name of the Course	CO Code	Course Outcome (CO)
Transportation Engineering. – II	CE-C604.1	To understand the Basic concept about highway engineering.
	CE-C604.2	To understand the Types of pavements different elements in each type.
	CE-C604.3	To understand the Materials used for highway construction
	CE-C604.4	To understand the Method of design of flexible rigid pavement.

	CE-C604.5	To understand the Construction & maintenance of different type of pavement
	CE-C604.6	To understand the Different types of traffic control systems

CE-C605-Environmental Engineering – I

Name of the Course	CO Code	Course Outcome (CO)
Environmental Engineering – I	CE-C605.1	To prepare students who can accomplish planning, design & construction of water systems & related infrastructural facilities.
	CE-C605.2	To give a practical orientation to so that they can give practical solutions to environmental problems in our society.
	CE-C605.3	To inculcate the students with sound theoretical knowledge in engineering sciences as well as in research consultancy skills.
	CE-C605.4	To impart positive responsive vocational attitudes, initiative creative thinking in their mission as engineers

CE-C606- Theory of Reinforced and Prestressed Concrete

Name of the Course	CO Code	Course Outcome (CO)
Theory of Reinforced and Prestressed Concrete	CE-C606.1	To study the analysis & design of various elements of the reinforced concrete structures such as beam, using the concept of working stress method.
	CE-C606.2	To study the analysis & design of variousslab,using the concept of working stress method.
	CE-C606.3	To study the analysis & design of variouscolumn,using the concept of working stress method.
	CE-C606.4	To study the analysis & design of variousfootingsusing the concept of working stress method.

CE-C603- Applied Hydraulics – II Lab

Name of the Course	Code	Course Outcome (CO)
Applied Hydraulics – II Lab	CE-C603.1	To determine chezy's constant
	CE-C603.2	To study the phenomenon of hydraulic jump
	CE-C603.3	To Determine the coeeficient of discharge of the Venturiflume.
	CE-C603.4	To determine co-efficient of discharge for the standing wave flume or modular flume
	CE-C603.5	To study the phenomenon of broad crested weir and determine the value of co-efficient of discharge.
	CE-C603.6	To determine the value of co-efficient of discharge for the Spillway.

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CE-C604-Transportation Engineering. – II(LAB)

Name of the Course	CO Code	Course Outcome (CO)
Transportation Engineering – II LAB	CE-C604.1	To determine the shape test on aggregates
	CE-C604.2	To determine the impact test on aggregates
	CE-C604.3	To determine the abration test on aggregates
	CE-C604.4	To determine the crushing value test on aggrgates
	CE-C604.5	To determine the penetration test on bitumen
	CE-C604.6	To determine the softning point test on bitumen
	CE-C604.7	To determine the ductility test
	CE-C604.8	To determine the viscosity test on bitumen

CE-C605-Environmental Engineering – I Lab-I

Name of the Course	CO Code	Course Outcome (CO)
Environmental Engineering – I Lab-I	CE-C605.1	To Determine the Alkalinity in water.
	CE-C605.2	To Determine the Hardness of water.
	CE-C605.3	To Determine the pH of water.
	CE-C605.4	To Determine the Turbidity of water. ,
	CE-C605.5	To Determine the Optimum dose of coagulant by using Jar test Apparatus.
	CE-C605.6	To Determine the Residual chlorine from water
	CE-C605.7	To Determine the of pH
	CE-C605.8	To Determine the moisture content
	CE-C605.9	To Determine the Most probable number

CE-C605-GeotechnicalEngineering – II

Name of the Course	CO Code	Course Outcome (CO)
GeotechnicalEngineering – II	CE-C601	To understand the importance and basics of foundation engineering in the civil engineering projects
	CE-C601	To study the classical theories of earth pressure, load bearing capacity and settlement of foundations.
	CE-C601	To study the geotechnical aspects of foundations in view of safety and economy.

	CE-C601	To understand the use of various BIS codes in the geotechnical design of foundation

CE-C605-GeotechnicalEngineering – II (LAB)

Name of the Course	CO Code	Course Outcome (CO)
GeotechnicalEngineering – II (LAB)	CE-C605	To determine the California bearing ratio
	CE-C605	To determine the settlements due to primary consolidation of soil by conducting one dimensional test.
	CE-C605	To determine the shearing strength of the soil using the direct shear apparatus
	CE-C605	To determine shear parameters of cohesive soil
	CE-C605	To find the shear of the soil by UndrainedTriaxial Test
	CE-C605	To find shear strength of a given soil specimen.

CE-C701 - Limit State Method for Reinforced Concrete Structures

Name of the Course	CO Code	Course Outcome (CO)
Limit State Method for Reinforced Concrete Structures	CE-C701.1	Understand the pros and cons of the ULM , LSM and Working Stress method (WSM)
	CE-C701.2	Understand the various clauses specified in IS: 456-2000 for designing structural members with the safety and economy
	CE-C701.3	Understand the application and effectiveness of the LSM to the considerable extent along with the application of ULM in the limited extent.

CE-C701 - Limit State Method for Reinforced Concrete Structures Tutorial

Name of the Course	CO Code	Course Outcome (CO)
Limit State Method for Reinforced Concrete Structures	CE-C701.1	Understand the pros and cons of the ULM , LSM and Working Stress method (WSM)
	CE-C701.2	Understand the various clauses specified in IS: 456-2000 for designing structural members with the safety and economy
	CE-C701.3	Understand the application and effectiveness of the LSM to the considerable extent along with the application of ULM in the limited extent.

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CE-C702- Quantity Survey Estimation and Valuation

Name of the Course	CO Code	Course Outcome (CO)
Quantity Survey Estimation and Valuation	CE-C702.1	Read, understand and interpret plans, sections, detailed drawings and specifications for a construction project.
	CE-C702.2	Prepare approximate and detailed estimates based on the quantity survey of the available general and detailed drawings
	CE-C702.3	Understand the process of arbitration.
	CE-C702.4	Understand the role of a valuer and assess the value of a property.
	CE-C702.5	Draft tenders, prepare valid contract documents

CE-C702- Quantity Survey Estimation and Valuation Tutorial

Name of the Course	CO Code	Course Outcome (CO)
Quantity Survey Estimation and Valuation	CE-C702.1	Draft specifications, make bar bending schedules and draw mass haul diagrams.
	CE-C702.2	Have Knowledge about the current market rates for labour and material required for construction
	CE-C702.3	Perform rate analysis and compare with DSR.

CE-C703- Irrigation Engineering

Name of the Course	CO Code	Course Outcome (CO)
Irrigation Engineering	CE-C703.1	Calculate the demand of water required for agricultural land
	CE-C703.2	Understand basic requirements of irrigation and how can they be managed
	CE-C703.3	Apply their knowledge on ground water, well hydraulics to estimate the safe yield and ground water potential
	CE-C703.4	Perform analysis and design of various Irrigation systems including hydraulic structures
	CE-C703.5	Carry out design of water resources projects independently

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CE-C703- Irrigation Engineering Tutorial

Name of the Course	Code	Course Outcome (CO)
Irrigation Engineering	CE-C703.1	To collect the data for irrigation system.
	CE-C703.2	To calculate the yield from catchments.
	CE-C703.3	To calculate the capacity of Canals.
	CE-C703.4	To calculate the storage capacity of reservoirs
	CE-C703.5	To decide the section of Dams, Weirs and Barrages.
	CE-C703.6	To classify the Canals and design the Canals

CE-C70 -Environmental Engineering – II

Name of the Course	CO Code	Course Outcome (CO)
Environmental Engineering – II Lab	CEC701.1	To ensure the safe handling and treatment of wastewater and sewage.
	CEC701.2	To conduct quality control tests on samples obtained from sewer water, soil, nearby rivers and groundwater.
	CEC701.3	To design the treatment facilities and assess the guidelines for disposing of waste.
	CEC701.4	To formulate approaches to treat waste water in most effective manner.

CE-C70 -Environmental Engineering – II Lab

Name of the Course	CO Code	Course Outcome (CO)
Environmental Engineering – II Lab	CEC701.1	Determination of Total Solids, suspended solids, dissolved solids, volatile solids
	CEC701.2	Determination of Bio chemical Oxygen Demand of sewage sample
	CEC701.3	Determination of Chemical Oxygen Demand of sewage sample
	CEC701.4	Determination of pH of sewage

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CE-E705 - Solid Waste Management

Name of the Course	CO Code	Course Outcome (CO)
Solid Waste Management	CE-E705.1	Able to understand the various methods of disposal of solid waste.
	CE-E705.2	Better understanding of the nature and characteristics of solid waste and regulatory requirements regarding solid waste management and further they shall have an ability to plan waste minimization
	CE-E705.3	To contribute practical solutions to environmental problems in our society

CE-E705 - Prestressed Concrete

Name of the Course	CO Code	Course Outcome (CO)
Prestressed Concrete	CE-E705.1	To understand the concept of pre-stressing, behavior of the pre-stressed structures vis- à-vis that of the RCC structure.
	CE-E705.2	To take the decision with respect to the choice of pre-stressed section over RCC
	CE-E705.3	To understand the application of these techniques in civil engineering construction, especially in mass housing, railway sleepers, transmission of poles, bridges, etc.
	CE-E705.4	To analyze the various pre-stressed components of the structures and design the same.

CE-C801- Design and Drawing of Reinforced Concrete Structures

Name of the Course	CO Code	Course Outcome (CO)
Design and Drawing of Reinforced Concrete Structures	**CE-C801.1**	To independently or as a member of the team design the structures using structural analysis and design knowledge for safety, serviceability and economy.
	CE-C801.2	The student shall be able to design different types of water tank, retaining wall by limit state method
	CE-C801.3	The student shall be able to design a residential and industrial buildings by relevant IS code.

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CE-C802 - Construction Engineering

Name of the Course	CO Code	Course Outcome (CO)
Construction Engineering	CE-C802.1	To know the different types of standard / special equipment used in the construction industry and select the appropriate equipment.
	CE-C802.2	To determine the optimal use of the equipment, owning, operating and maintenance and repair costs of the equipment.
	CE-C802.3	To decide judiciously whether the equipment should be purchased or hired, repaired or sold
	CE-C802.4	To select the alignment for tunnels, various methods of tunneling in soft soils as well as in hard rock, sequence of operations to be followed along with the various tunneling machines.
	CE-C802.5	To decide the ground improvement and soil stabilization methods such as sand drains and stone columns, use of geo-synthetics and chemicals based on the suitability of the site conditions.
	CE-C802.6	To suggest mass concreting, vacuum concreting and modern slip forms techniques.

CE-C803 - Construction Management

Name of the Course	CO Code	Course Outcome (CO)
Construction Management	CE-C803.1	To understand and apply the knowledge of management functions like planning, scheduling, executing and controlling to construction projects.
	CE-C803.2	To demonstrate their capability for preparing the project networks to work out best possible time for completing the project.
	CE-C803.3	To understand and exercise the time- cost relationship in practices.
	CE-C803.4	To implement the safety as well as quality aspects during the execution of civil engineering project.
	CE-C803.5	The course will inculcate the managerial skills among the students which will be helpful for them in future during actual execution of projects

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CE-804 - Design of Hydraulic Structures

Name of the Course	CO Code	Course Outcome (CO)
Design of Hydraulic Structures	CE-804.1	Select the site for dam with preliminary and final investigations, fix storage capacity, analyze reservoir losses, and estimate sedimentation in reservoirs
	CE-804.2	Analyze forces acting on gravity dam its failure and carry out stability analysis of gravity dams.
	CE-804.3	Understand forces on an arch and buttress dams and its design
	CE-804.4	Understand details of construction and maintenance of earth fill and rock fill dams including stability analysis criteria
	CE-804.5	Understand design principles of spillways, energy dissipation works and flood control works.
	CE-804.6	Design small bridges and culverts and its principles of hydraulic design.

CE-E804 - Industrial Waste Treatment

Name of the Course	CO Code	Course Outcome (CO)
Industrial Waste Treatment	CE-E804.1	An ability to understand the industrial waste sources, effects and its treatment.
	CE-E804.2	The various methods of disposal of industrial waste
	CE-E804.3	Understanding of the nature and characteristics of industrial waste and regulatory requirements regarding industrial waste treatment and lastly, they will have an ability to plan industrial waste minimization.

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Program level Course –PO & PSO mapping of all courses excluding first year courses

Admitted Batch 2023-2024

Sr.No.	Course	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	CE201	3	3	3	3									3		3
2	CE202	3	2	3			2							3		3
3	CE203	2	2	2	2									1		
4	CE204	3					3		2					2		
5	CE205	2				2	3	2	2					2		3
6	CE206	2		3						9				2		3
7	CE207	2		2						2				2		3
8	CE208	2		3			1			3				3		3
9	CE209	1	1	1	2					2				1		1
10	CE210	2		3			3			3				2		
11	CE211			2				3		2	2			2		1
12	CE212	3	3	3	3									3		3
13	CE213	2	1	3	1	1	2	2	2	2	2	2	1	3	1	2
14	CE214	2	1	2	1		1	1	1	1	1	1	2	1	1	2
15	CE215	2	2	2	2									1		1
16	CE216	2	1	2	1	1	1	1	1	1	2		1	3	1	2
17	CE217	2	2	2	3	2	2							3	1	2
18	CE218	2		2						2				2		3
19	CE219	3	2	3			2							2		2
20	CE220	1	1	1			1	2	1	2	2	2	1	3	1	2
21	CE221	2	1	2	2									2		2
22	CE222	2	1	3	1	1	2	1	1	2	2	2	1	2		2
23	CE301	2	1	2	1		1						1	1		2
24	CE302	2	1	3	1	1	2	1	1				1	2		2
25	CE303	2	1	3	1	1	2	2	2					3	1	2
26	CE304	3	3	2	2	1	2						3	2		3
27	CE305	2	1	2			3	2					1	1		2

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28	CE306			3			2			2	3		1		3	3
29	CE307	2	2	3	2	3	1	1					2	1		2
30	CE308			3						2			2	2		2
31	CE309			3		3				3			2	1		2
32	CE310		1	3			2	2	2	2			1	3	1	2
33	CE311	2				2				2					2	
34	CE312	2	1	2	1		1						1	1		2
35	CE313		2		2	1	2		1				2	2	2	
36	CE314		1	3		3				2				3	1	2
37	CE315	2	2	3		2							1	3	1	2
38	CE316	2	1	3		1	2	2	2	2	2	2	1	3	1	2
39	CE317	2	2	1		3	3	2					1	2	2	1
40	CE318	2	2	3	2	3	1	1					2	1		2
41	CE319	2	1	3	1	1	2	2	2	2	2	2	1	3	1	2
42	CE320					2				2			2	2		2
43	CE321			2						2			2	2		2
44	CE322	2		1		2	2			2						2
45	CE323		2	2						2			2	2		2
46	CE324					0				0			0	2		0
47	CE325			2						2			2	2		2
48	CE401	2	2		1	2	2	2	0	2	0	0	2	2	1	1
49	CE402	2	2		1			2	0		0	0		2	1	
50	CE403	2	1	3	1	1	2	2	2	2	2	2	1	3	1	2
51	CE404	2	2	3		3	2						2	2	1	2
52	CE405		2	2	1	1	2	2					1	3	1	2
53	CE406	2	1	3	1	1	2	2	2	2	2	2	1	3	1	2
54	CE407	1		2			3			1				2		2
55	CE408			2			2	2		2	2			3	1	2
56	CE409	2	2	2	3		2							2		2
57	CE410			3		3	2			3	2		1	2		2
58	CE411						2			3	2		2	3		3
59	CE412	3	1	2			2	3	2		2		1	3	1	2
60	CE413	2	1	3	1	1	2	1			2		1	2		2
61	CE414	2	1	3	1	1	2	2	2	2	2	2	1	3	1	2
62	CE415	2	1	2	1	1	2	2			2		1	2	1	2

63	CE416	2					2			2				2		2
64	CE417			2			2	2		2	2			2		2
65	CE418			2		2	2			2	2		1	3	1	2
66	CE419			2			2	2		2	2			3	1	2
67	CE420					1	2			2	2		1	3		2

Correlation level 1,2 and 3 are defined as follows:

1. Slight (Low) 2. Moderate (Medium) 3. Substantial (High)

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Program level Course –PO & PSO Attaintment excluding first year courses

Admitted Batch 2023-2024

Sr.No.	Course	CO Avg	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
1	CE201	0.68	2.04	2.04	2.04	2.04									2.04		2.04
2	CE202	0.66	1.98	1.32	1.98			1.32							1.98		1.98
3	CE203	0.68	1.36	1.36	1.36	1.36									0.68		
4	CE204	0.73	2.19					2.19		1.46					1.46		
5	CE205	0.74	1.48				1.48	2.22	1.48	1.48					1.48		2.22
6	CE206	0.87	1.48				0.00	0.00						0.00	1.74		2.61
7	CE207	1.00	2.00		2.00						2.00				2.00		3.00
8	CE208	0.67	1.34		2.01			0.67			2.01				2.01		2.01
9	CE209	0.33	0.33	0.33	0.33	0.66					0.66				0.33		0.33
10	CE210	0.66	1.32		1.98			1.98			1.98				1.32		
11	CE211	0.89			1.78				2.67		1.78	1.78			1.78		0.89
12	CE212	0.87	2.61	2.61	2.61	2.61									2.61		2.61
13	CE213	0.71	1.42	0.71	2.13	0.71	0.71	1.42	1.42	1.42	1.42	1.42	1.42	0.71	2.13	0.71	1.42
14	CE214	0.74	1.48	0.74	1.48	0.74		0.74	0.74	0.74	0.74	0.74	0.74	1.48	0.74	0.74	1.48
15	CE215	0.68	1.36	1.36	1.36	1.36									0.68		0.68
16	CE216	0.68	1.36	0.68	1.36	0.68	0.68	0.68	0.68	0.68	0.68	1.36		0.68	2.04	0.68	1.36
17	CE217	0.72	1.44	1.44	1.44	2.16	1.44	1.44							2.16	0.72	1.44
18	CE218	0.67	1.34		1.34						1.34				1.34		2.01
19	CE219	0.86	2.58	1.72	2.58			1.72							1.72		1.72

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20	CE220	0.53	0.53	0.53	0.53			0.53	1.06	0.53	1.06	1.06	1.06	0.53	1.59	0.53	1.06
21	CE221	0.53	0.52	0.53	1.06	0.53									1.58		0.79
22	CE222	0.87	1.74	0.87	2.61	0.87	0.87	1.74	0.87	0.87	1.74	1.74	1.74	0.87	1.74		1.74
23	CE301	0.67		0.80	0.08		1.20				0.90	0.87		0.87	0.91	1.23	1.23
24	CE302	0.79	1.58	0.79	1.58	0.79		0.79						0.79	0.79		1.58
25	CE303	0.67	1.34	0.67	2.01	0.67	0.67	1.34	0.67	0.67				0.67	1.34		1.34
26	CE304	0.64	1.28	0.64	1.92	0.64	0.64	1.28	1.28	1.28					1.92	0.64	1.28
27	CE305	0.69	1.79	1.93	1.24	1.04	0.97	1.24						1.79	1.52		1.79
28	CE306	0.67	1.34	0.67	1.34			2.01	1.34					0.67	0.67		1.34
29	CE307	0.33			0.99			0.66			0.66	0.99		0.33		0.99	0.99
30	CE308	0.87	1.74	1.74	2.61	1.74	2.61	0.87	0.87					1.74	0.87		1.74
31	CE309	0.67			2.01						1.34			1.34	1.34		1.34
32	CE310	0.80			2.40						2.40			1.60	0.80		1.60
33	CE311	0.73		0.73	2.19			1.46	1.46	1.46	1.46			0.73	2.19	0.73	1.46
34	CE312	0.67	1.34				1.34				1.34					1.34	
35	CE313	0.64	1.28	0.64	1.28	0.64		0.64						0.64	0.64		1.28
36	CE314	0.58		1.16		1.16	0.58	1.16		0.58				1.16	1.16	1.16	
37	CE315	0.68		0.68	2.04		2.04				1.36				2.04	0.68	1.36
38	CE316	0.67	1.34	1.34	2.01		1.34							0.67	2.01	0.67	1.34
39	CE317	0.66	1.32	0.66	1.98		0.66	1.32	1.32	1.32	1.32	1.32	1.32	0.66	1.98	0.66	1.32
40	CE318	0.68	1.28	0.64	1.28		1.28	0.64	1.28					0.73	2.19	1.16	0.58
41	CE319	0.87	1.74	1.74	2.61	1.74	2.61	0.87	0.87					1.74	0.87		1.74

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42	CE320	1.00	2.00	1.00	3.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	3.00	1.00	2.00
43	CE321	1.00					2.00				2.00			2.00	2.00		2.00
44	CE322	0.73			1.46						1.46			1.46	1.46		1.46
45	CE323	0.67	1.34		0.60		1.34	1.20			0.52						0.64
46	CE324	0.33		0.66	0.66						0.66			0.66	0.66		0.66
47	CE325	0.72	1.56	1.44	1.56	1.42	0.78	0.78	2.10	0.80				1.56	1.44	0.91	0.78
48	CE401	0.76	0.75	1.52	0.85		0.74	0.85	2.20	0.90	0.86	1.23	2.10	1.52	1.52	0.75	0.75
49	CE402	0.78	1.56	0.78	2.34	0.78	0.78	1.56	1.56	1.56	1.56	1.56	1.56	0.78	2.34	0.78	1.56
50	CE403	0.69	1.38	1.38	2.07		2.07	1.38						1.38	1.38	0.69	1.38
51	CE404	0.72		1.44	1.44	0.72	0.72	1.44	1.44					0.72	2.16	0.72	1.44
52	CE405	1.00	2.00	1.00	3.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	3.00	1.00	2.00
53	CE406	0.87	0.87		1.74			2.61			0.87				1.74		1.74
54	CE407	1.00			2.00			2.00	2.00		2.00	2.00			3.00	1.00	2.00
55	CE408	0.67	1.34	1.34	1.34	2.01		1.34							1.34		1.34
56	CE409	0.73			2.19		2.19	1.46			2.19	1.46		0.73	1.46		1.46
57	CE410	1.00						2.00			3.00	2.00		2.00	2.60		2.60
58	CE411	0.74	1.85	0.74	1.63			1.48	2.22	1.23		1.48		0.74	1.85	0.74	1.48
59	CE412	0.72	1.44	0.72	2.16	0.72	0.72	1.44	0.72			1.44		0.72	1.44		1.44
60	CE413	0.79	1.58	0.79	2.37	0.79	0.79	1.58	1.58	1.58	1.58	1.58	1.58	0.79	2.37	0.79	1.58
61	CE414	0.80	1.60	0.80	1.60	0.80	0.80	1.60	1.60			1.60		0.80	1.60	0.80	1.60
62	CE415	0.73	0.74					0.74			0.84				0.52		1.20
63	CE416	0.73			0.72			1.60	0.80		0.75	0.52			0.78		0.84

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64	CE417	0.87			1.74		1.74	1.74			1.74	1.74		0.87	2.61	0.87	1.74
65	CE418	0.87			1.74			1.74	1.74		1.74	1.74			2.61	0.87	1.74
66	CE419	0.88			0.00			1.46	0.00		1.46	1.46			2.19		1.46
67	CE420	1.00					1.00	2.00			2.00	2.00		1.00	3.00		2.00
Direct Attaintment 80% weightage			1.47	1.06	1.68	1.12	1.17	1.36	1.37	1.19	1.45	1.48	1.55	1	1.66	0.84	1.5
Indirect Attaintment 20% weightage			1.69	1.29	2.05	1.3	1.41	1.7	1.58	1.38	1.76	1.73	1.64	1.2	1.91	0.97	1.76
PO & PSO Attaintment			**1.58**	**1.17**	**1.86**	**1.21**	**1.29**	**1.53**	**1.47**	**1.23**	**1.6**	**1.6**	**1.57**	**1.1**	**1.78**	**0.9**	**1.63**

PO & PSO Attainment = Direct attainment(80%) + Indirect attainment(20%)