



METHODIST
COLLEGE OF ENGINEERING & TECHNOLOGY
 [Autonomous Institution]

Accredited by NAAC with A+ and NBA
 Affiliated to Osmania University & Approved by AICTE



DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES (A.Y:2025-2026)

S.No	Semester	Course Code	Course Name	CO No.	Course Outcomes
1	III	M24BS305HS	Numerical Methods and Partial Differential Equations	CO1	Find the solution of algebraic and transcendental equations using numerical methods.
				CO2	Apply numerical techniques to solve ordinary differential equations and definite integrals.
				CO3	Apply numerical methods to interpolate values and fit different curves from given data
				CO4	Find solutions of first order linear and non-linear partial differential equations
				CO5	Apply the solution of partial differential equations to physical problems.
2	III	M24PC301CE	Building Materials and Construction Practices	CO1	Illustrate sustainable construction practices by utilizing eco-friendly materials and methods to minimize environmental impact and promote resource efficiency in building projects.
				CO2	Demonstrate proficiency in the preparation and application of cementitious materials and finishing techniques, addressing common issues to enhance durability and aesthetics.
				CO3	Apply design and plan building layouts considering functional requirements, site conditions, orientation, and regulatory compliance to promote safe and efficient built environments.
				CO4	Choose appropriate construction materials based on their physical, mechanical, and chemical properties to ensure structural integrity and sustainability.

				CO5	Conclude construction methodologies, including structural systems and formwork practices, to execute projects efficiently while minimizing environmental impact.
3	III	M24PC302CE	Solid Mechanics	CO1	Apply the fundamental concepts of stress and strain in the analysis and design of axially loaded members
				CO2	Analyze the compound stresses at a point and evaluate principal stresses & stresses in cylindrical pressure vessels
				CO3	Analyze determinate beams to construct shear force diagram and bending moment diagrams
				CO4	Analyze the bending and shear stress distribution in beams and also the stresses in members subjected to combined axial and bending loads
				CO5	Evaluate the stresses of circular members subjected to torsion and analyze different types of springs
4	III	M24PC303CE	Fluid Mechanics	CO1	Explain basic fluid properties and their role in water systems.
				CO2	Discuss and classify different types of fluid flow and use continuity equations.
				CO3	Apply fluid statics to calculate pressure and buoyancy.
				CO4	Apply Bernoulli's equation and momentum principles to solve problems related to fluid motion and flow-measuring devices.
				CO5	Analyze and solve problems related to flow through pipes from practitioners point of view
5	III	M24PC304CE	Surveying and Geomatics Engineering	CO1	Explain the terminologies and concepts involved in basic and modern surveying equipment & technologies
				CO2	Calculate the lengths, bearings, areas, volumes, reduced levels of ground terrain using surveying techniques
				CO3	Determine the horizontal and vertical angles, elevation of accessible & inaccessible objects using theodolite
				CO4	curves
				CO5	Show the role of Total Station, GNSS and Photogrammetric methods in planning sustainable infrastructure and urban settlements

6	III	M24MC302HS	Essence of Indian Tradition and Knowledge	CO1	Understand the concepts of Indian culture and Traditions and their Importance
				CO2	Distinguish the Indian Languages
				CO3	Show the basic understanding of Indian religion and Philosophy
				CO4	Show the basic understanding about the fine arts in India
				CO5	Analyze and apply the principles of traditional Indian Education to contemporary learning systems
7	III	M24PC351CE	Surveying and Geomatics Laboratory	CO1	Perform linear and chain surveying operations to measure linear dimensions of the ground with appropriate tools
				CO2	Execute and operate levelling instruments to determine reduced levels of ground accurately
				CO3	Execute field measurements using surveying equipment to compute lengths, areas, angles and bearings
				CO4	Demonstrate the working principles and handle the total station and Hand-held GPS for field data collection
				CO5	Master the procedures of trigonometrical levelling to determine reduced levels of elevated objects at both accessible and inaccessible locations
8	III	M24PC352CE	Fluid Mechanics Laboratory	CO1	Replicate setups and measure discharge using Rectangular, V, and Trapezoidal Notches.
				CO2	Perform discharge measurements using Venturimeter, Orifice meter, Circular Orifice, and Mouthpieces.
				CO3	Execute Reynolds experiments and flow classification tests to identify flow regimes.
				CO4	Calibrate devices and compare results with theory.
				CO5	Demonstrate the tests to determine friction factor and pipeline losses.
9	III	M24PC353CE	Building Drawing & Drafting Laboratory	CO1	Execute the basic principles of building planning and drawings as per codal provisions
				CO2	Execute and develop structural drawings of various building components using AutoCAD tools.
				CO3	Demonstrate the basic principles of drafting residential building plans, elevations, and sections using AutoCAD.

			Drafting Laboratory	CO4	Demonstrate and refine the drafting of isometric views for single-storey and double-storey residential buildings with precision
				CO5	Calibrate and demonstrate the precise drafting of sustainable and accessible design components—like solar panels and ramps—in architectural drawings using AutoCAD.
10	IV	M24HS402HS	Human Values and Professional Ethics	CO1	Identify the role of a human being in ensuring harmony in society and nature
				CO2	Practice the significance of value inputs and start applying them in their life and profession
				CO3	Compare between values and skills, happiness and accumulation of physical facilities with regard to the self and the body, intention and competence of an individual, etc.
				CO4	Integrate the difference between ethical and unethical practices, and apply ethical practices in personal and professional lives.
				CO5	Internalize ethical values in the light of the problems from the perspective of the social context.
11	IV	M24HS403BM	Managerial Economics & Financial Accountancy	CO1	Determine the responsibilities & decision making in the organisation
				CO2	Understand the various factors influencing demand & market structure
				CO3	Understand the principles of Accounting & solve the problems
				CO4	Analyse the financial performance
				CO5	Understand the capital structure & to take decision on selection of projects
12	IV	M24PC405CE	Advance Geomatics Engineering	CO1	Explain the basic principles of remote sensing, radiation laws, sensor types, orbital characteristics, and Sensor Characteristics
				CO2	Demonstrate the use of geospatial data, GIS components, spatial data models, coordinate transformations, and error correction techniques
				CO3	Illustrate various digital image processing techniques including enhancement and classification methods
				CO4	Apply raster and vector spatial analysis operations, interpret DEMs, and perform terrain modeling using GIS tools
				CO5	Analyze the role of GIS in sustainable development applications including urban planning, natural resource and infrastructure management

13	IV	M24PC406CE	Construction Engineering Management	CO1	Illustrate the construction industry, construction practices, and management systems to construction projects
				CO2	Explain various types of contract documents, tenders, detailed project reports and labor acts in construction practice.
				CO3	Apply AI and data-driven tools in project management for improving construction efficiency, sustainability, and resilience
				CO4	Apply various network theories such as PERT, CPM in construction management to construction projects
				CO5	Apply optimization techniques and linear programming in construction practice
14	IV	M24PC407CE	Concrete Technology	CO1	Explain the properties of concrete making materials, production processes of concrete and the effects of water-cement ratio, segregation, and
				CO2	Use the workability of fresh concrete to assess its suitability for structural applications using standard test methods.
				CO3	Compute concrete mix designs using IS/ACI methods and select appropriate special concretes for sustainable construction applications.
				CO4	Analyze the time-dependent and stress-strain behavior of hardened concrete under various loading conditions.
				CO5	Relate the durability of concrete and the effectiveness of admixtures in enhancing performance under extreme environments.
15	IV	M24PC408CE	Hydraulics & Hydraulic Machinery	CO1	Explain open channel flows, compute uniform flow parameters, and design the most economical channel section
				CO2	Explain the behavior of hydraulic jumps and energy dissipation in non-uniform open channel flow.
				CO3	Apply dimensional analysis and similitude principles using various theorem in fluid modeling.
				CO4	Analyze the working and efficiency of hydraulic machines
				CO5	Analyze, design and solve problems pertaining to compressible flows
				CO1	Analyze slope and deflection of beams using double integration, Macaulay's method, moment area, and conjugate beam methods

16	IV	M24PC409CE	Mechanics of Materials and Structures	CO2	Analyse shear center and static/kinematic indeterminacy for simple structural forms, enhancing their understanding of load paths.
				CO3	Analyze beams, indeterminate trusses and frames to find deflections and redundant forces by applying the energy principles and various energy methods.
				CO4	Analyze structural elements in a way that supports the creation of safe and sustainable infrastructure, contributing to long-lasting buildings and urban development.
				CO5	Evaluate the strength and stability of columns with different end conditions using Euler's, Rankine's, and other applicable theories.
17	IV	M24PC454CE	Concrete Technology Laboratory	CO1	Perform the tests to determine the properties of given cement sample and assess its suitability for use in construction.
				CO2	Execute standard test procedures to determine the properties of fine and coarse aggregates
				CO3	Demonstrate destructive and non-destructive tests to evaluate the quality and strength of concrete
				CO4	Master the procedure to determine the compressive strength of concrete
				CO5	Master the method to determine the workability of concrete and recommend its suitability for structural works.
18	IV	M24PC455CE	Hydraulic & Hydraulic Machinery Laboratory	CO1	Replicate open channel flow experiments and measure roughness coefficient using Chezy's and Manning's formulas.
				CO2	Perform experiments to determine vane coefficient and basic flow parameters by following standard procedures.
				CO3	Calibrate and demonstrate performance curves of pumps and turbines to accurately interpret their behavior.
				CO4	Demonstrate Froude's model law in open channel flow.
				CO5	Design and develop methods to identify and analyze the characteristics of a hydraulic jump for practical engineering use.
				CO1	Measure stress-strain behavior and elastic properties of ductile materials using tensile testing equipment
				CO2	Assemble beam setups to evaluate flexural behavior under different loading conditions.

19	IV	M24PC456CE	Mechanics of Materials Laboratory	CO3	Perform mechanical tests on springs and impact testing machines to assess energy absorption and impact strength of materials.
				CO4	Demonstrate the use of hardness testing machine to determine the hardness of metals such as brass, copper, and aluminum.
				CO5	Adapt sustainable material testing techniques to optimize construction material selection, ensuring durability and minimal environmental impact.
20	V	2ES506CE	Disaster Preparedness and Planning	CO1	Apply the concepts of disaster management to evaluate a disaster situation
				CO2	Interpreting the causes of disaster and after effects of disasters.
				CO3	Select appropriate pre-disaster, during disaster and post-disaster measures and framework
				CO4	Identify the disaster management acts and frameworks specific to India relevant to a situation.
				CO5	Identify a suitable technological application to aid disaster management
21	V	2PC508CE	Structural Analysis	CO1	Solve statically indeterminate beams and portal frames using slope deflection, moment distribution and Kani's method.
				CO2	Analyze the difference between slope deflection, moment distribution and Kani's method of analysis.
				CO3	Analyze SFD and BMD of statically indeterminate beams and portal frames using slope deflection, moment distribution and Kani's method.
				CO4	Develop Stiffness matrix to analyze continuous beams and portal frames
				CO5	Analyze both the two hinged and three hinged arches with different geometry and subjected to different loading conditions
22	V	2PC509CE	Soil Mechanics	CO1	Classify the soil and interpret their index properties
				CO2	Explain capillarity and laboratory procedure to determine the permeability parameters. Calculate the capillarity and permeability parameters of soils.
				CO3	Explain Seepage, quick sand condition and soil stresses. Draw a flow net to compute the seepage quantity in soils
				CO4	Illustrate the mechanisms of the process of compaction and consolidation of soils, and the laboratory procedures to determine their characteristics
				CO5	Analyse the soils for their shear strength and predict the stability of slopes
				CO1	Classify various types of flow in pipes
				CO2	Demonstrate friction loss in laminar and turbulent flows

23	V	2PC510CE	Hydraulics Engineering	CO3	Solve various problems in open channels
				CO4	Illustrate the hydraulic jumps and its uses
				CO5	Apply their knowledge of fluid mechanics in addressing problems in hydraulic machinery.
24	V	2PC511CE	Water Resources Engineering	CO1	Find crop–water requirements
				CO2	Explain the design aspects of different types of wells and regulatory systems.
				CO3	Design different types of storage works and fixation of different levels of reservoirs.
				CO4	Analyze and design gravity dams and earthen dams.
				CO5	Analyze the different types of cross drainage structures
25	V	2PC512 CE	Design of Steel Structures	CO1	Explain the composition of structural steel and IS codal provisions and load combinations implemented in the design codes for steel structures
				CO2	Analyze and design simple connections between structural members including riveted and welded connections.
				CO3	Analyze tension & compression members and column bases
				CO4	Design tension & compression members and column bases
				CO5	Evaluate the loading on roof trusses and design of purlins
26	V	6OE501ME	Start Up & Entrepreneurship	CO1	Explain and discuss the concept of entrepreneurship, functions of entrepreneurship, characteristics of entrepreneurs and the role of small-scale industries in economic growth
				CO2	Explain and discuss the Indian industrial environment, types of enterprises and the role of women and first-generation entrepreneurs.
				CO3	Apply and use the concept of project formulation to analyze market demand, technical feasibility and financial feasibility of a business plan
				CO4	Apply and use the concept of Intellectual Property Rights in understanding patent protection, licensing and technology transfer.
				CO5	Analyze the concept of start-ups, start-up strategies, policies and the growth of start-ups in India.
27	V	2PC555CE	Soil Mechanics Laboratory	CO1	Determine Specific gravity of different soils by test results, interpret and validate the same
				CO2	Analyze particle size distribution of soil by conducting sieve analysis test.
				CO3	Analyze the behavior of soils with water by conducting tests

				CO4	Analyze shear strength of soils on application of stress in laboratory.
				CO5	Determine permeability and compaction characteristics of various soils
28	V	2PC556CE	Fluid Mechanics & Hydraulic Engineering Laboratory	CO1	Compute discharge flowing through streams and canals
				CO2	Determination the type of flow in pipe, and discharge through pipes and losses in pipes
				CO3	Competence in understanding flow phenomenon in open channels
				CO4	Analyze the force acting due to jets concept and its application in hydraulic machines
				CO5	Demonstrate working principles of hydraulic pumps and turbines.
29	V	PW501CE	Practice School - I/Internship Evaluation	CO1	Explain techniques, processes and tools used in the industry
				CO2	Discuss the current needs of the industry in his/her area of interest
				CO3	Explain the practical knowledge acquired in the chosen area/work done
				CO4	Summarize and prepare a technical report on practice school completed at industry
				CO5	Adapt to work in a team or as an individual effectively
30	VI	2PC613CE	Construction Engineering & Management	CO1	Understand the construction industry, construction practices, and management systems to construction projects
				CO2	Apply various network theories such as PERT, CPM in construction management to construction projects
				CO3	Analyze cost-time analysis, resource optimization techniques and apply project management software for resource optimization in construction projects.
				CO4	Understand various types of contract documents, tenders, detailed project reports and labor acts in construction practice.
				CO5	Apply optimization techniques and linear programming in construction practice
31	VI	2PC614CE	Transportation Engineering	CO1	Demonstrate fundamental concepts of transportation engineering
				CO2	Apply concepts to solve transportation problems
				CO3	Explain various traffic engineering studies and tests on materials.
				CO4	Apply the knowledge of pavement materials to a real-world problem.
				CO5	Remember the different types of transportation systems management

32	VI	2PC615CE	Environmental Engineering	CO1	Determine the water demand for different cities and Design the water supply network
				CO2	Design the components of water treatment plant and understand the concept of Building plumbing
				CO3	Calculate the sewage flow using different approaches through various sources and design the components of a simple sewerage system
				CO4	Explain the knowledge on sludge, solid waste treatment and disposal
				CO5	Identify air and noise pollution problems, pollution control methods, mechanism and devices.
33	VI	2PC616CE	Foundation Engineering	CO1	Define theories related to stress distribution of soil, types of foundations and their various bearing capacities as well as settlements
				CO2	Explain Safe bearing capacity of shallow foundations, sinking and stability of well foundations.
				CO3	Explain necessity, types, methods and suitability of pile foundations, caissons, coffer dams, geotechnical investigations and dewatering techniques
				CO4	Make use of field tests and settlement analysis to calculate vertical stresses, safe bearing capacity and settlements of shallow foundations.
				CO5	Make use of load tests and formulae to calculate load carrying capacities & efficiency of pile and pile groups.
34	VI	2PE601CE	Prestressed Structures	CO1	Explain the concept of pre-stressing and the behavior of concrete structures and recognize the general principles, methods of pre-stressing, and pre-stressing devices for pre- tensioning and post-tensioning
				CO2	Determine losses of pre-stress in pre-stressed concrete structures
				CO3	Apply the provisions of IS-1343(2012) code to the design of pre-stressed concrete structures for flexure and shear.
				CO4	Analyze the two-span continuous beam for different cable profile
				CO5	Analyze the stresses in anchorage zones and design end anchorages for prestressed concrete beams and evaluate the short- and long-term deflections of beams.
				CO1	Discuss basics of Photogrammetry, flight planning and stereoscopic vision
				CO2	Determine elevations, scale and lengths of the lines from photographs

35	VI	2PE604CE	Advance Surveying	CO3	Illustrate basics, energy interactions and sensor characteristics in Remote Sensing.
				CO4	Explain Segments, Errors and Positioning modes in GPS.
				CO5	Explain Map Projections, data models and spatial data creation and analysis in GIS.
36	VI	6OE602ME	3D Printing technologies	CO1	Describe the fundamentals of 3D printing, classify and explain advantages and disadvantages of 3D Printing technologies
				CO2	Select the suitable CAD data formats and software used in 3D Printing technology.
				CO3	Describe the operating principles, capabilities and limitations of liquid, solid & powder based 3D Printing Technologies.
				CO4	Compare different 3D printing technologies based on their process capabilities and applications
				CO5	Apply the capabilities and knowledge of 3D printing in different industrial sectors
37	VI	2HS653HS	Soft Skills Laboratory	CO1	Listen to a variety of speakers and texts and will be able to comprehend and perform the required tasks
				CO2	Interact in a group professionally and communicate confidently in terms of both the spoken and written communication
				CO3	Develop the skills and strategies of reading and writing
				CO4	Face any Interview confidently by managing time, making decisions by speaking appropriately according to the context
				CO5	Demonstrate right attitude and right skills to cope with team and communicate professionally.
38	VI	2PC657CE	Transportation Engineering Laboratory	CO1	Explain the principles of testing aggregates and bitumen
				CO2	Explain the principles of traffic engineering, such as capacity, level of service, and traffic signal design.
				CO3	Apply the IS 2386 code to perform tests on aggregates and bitumen
				CO4	Analyze traffic data to identify patterns and trends
				CO5	Evaluate the effectiveness of transportation engineering solutions to real-world problems

39	VI	2PC658CE	Environmental Engineering Laboratory	CO1	Analyse the water samples for the determination of pH, Acidity, Alkalinity, Total solids, Dissolved oxygen, BOD, COD etc.
				CO2	Ability to analyze the water and waste water samples and classify them.
				CO3	Ability to identify the potable water
				CO4	Ability to provide the type of treatment required.
				CO5	Demonstrate professional behavior in conducting the experiments and presenting the results effectively.
40	VII	2PC717CE	Estimation and Specification	CO1	Describe the types of estimates and different specifications required for construction works.
				CO2	Compute and prepare estimates for buildings using longwall-short wall method and center-line method.
				CO3	Compute and prepare estimates for roads, culverts, retaining walls, overhead tanks and irrigation canals.
				CO4	Estimate the steel quantities required for various Civil Engineering works and also prepare bar bending schedule.
				CO5	Analyse rates of different items of work based on specifications using Schedule of rates.
41	VII	2PC718CE	Highway Engineering and Pavement Design	CO1	Understand highway categories and assess their impact on design.
				CO2	Apply geometric design principles effectively for safe and efficient highways.
				CO3	Analyze stress in flexible and rigid pavements using relevant theories
				CO4	Understand factors influencing pavement design for optimal performance.
				CO5	Understand various pavement design approaches for both flexible and rigid pavements.
42	VII	2PE706CE	Sustainable Civil Engineering Materials	CO1	Understand sustainability in civil engineering, analyze environmental challenges, and apply Life Cycle Assessment (LCA) for evaluation
				CO2	Assess carbon emissions in cement production, explore alternative cements, and promote resource-efficient concrete solutions.
				CO3	Investigate operational energy reduction, net zero building techniques, and evaluate materials for minimizing resource utilization and water consumption.
				CO4	Examine radiation budget, surface water balance, and implement energy-efficient building envelopes using sustainable insulation materials and technologies

				CO5	Explore sustainable building rating systems like LEED, analyze green projects, and pursue LEED Green Associate certification.
43	VII	2PE708CE	Data Analytics in Civil Engineering	CO1	Define the terminology of basic statistics and probability.
				CO2	Explain the characteristics of different discrete and continuous distributions.
				CO3	Solve the problems using discrete and continuous distributions and draw conclusions.
				CO4	Apply correlation and Regression analysis
				CO5	Identify data collection process required for descriptive and exploratory models for problems in civil engineering.
44	VII	2PE709CE	Principles of Green Building Practices	CO1	Evaluate and choose eco-friendly building sites, considering location, amenities, and ecology.
				CO2	Implement strategies to optimize energy and water usage, including efficient landscaping and renewable energy integration.
				CO3	Select sustainable building materials, minimizing environmental impact and waste generation.
				CO4	Apply site analysis techniques to design buildings for energy efficiency and occupant comfort.
				CO5	Promote resource conservation and reduce carbon footprint through green building practices.
45	VII	2PE711CE	Principles of Climate Change	CO1	Describe the impacts of climate change on natural environment
				CO2	Explain the fundamentals of global water balance.
				CO3	Explain about climate changes and its impact on climate specifically under Intergovernmental Panel on Climate Change (IPCC) scenarios
				CO4	Brief Introduction of climate modeling using statistical downscaling techniques
				CO5	Describe Bias correction methods in climate science
46	VII	6OE703ME	Introduction to Robotics	CO1	Understand the principles and functions of robotic components
				CO2	Analyze the role of sensors, actuators, and controllers in robotic systems.
				CO3	Apply kinematic principles to model and control robot movement.
				CO4	Develop basic programming skills for robot control and simulation
				CO5	Understand socio economic aspects of robotics
47	VII	PW702CE	Guided Self-Study Software Certification	CO1	Proficiency in using civil engineering software.
				CO2	Independent navigation and utilization of software
				CO3	Application of software tools to solve engineering problems.

			Courses	CO4	Development of self-directed learning skills
				CO5	Attainment of industry-recognized software certifications.
48	VII	PW703CE	Technical Report and Seminar/Mini Project (Case study Based)	CO1	Identify their domain interest through critical review of literature
				CO2	Explain the civil engineering techniques, processes and tools used in the respective case study
				CO3	Develop the technical skill in preparing a well-structured report on the chosen topic
				CO4	Develop the skill of presenting a structured seminar using Power Point presentation tools
				CO5	Adapt to work in a team or as an individual effectively
49	VII	PW804CE	Major Project (OR) Professional Practice School-II	CO1	Identify, locate, and critically evaluate relevant literature and resources related to the project topic
				CO2	Formulate clear, achievable, measurable objectives and comprehensive action plans for their project.
				CO3	Evaluate and select suitable methods and modern tools for solving complex civil engineering problems
				CO4	Evaluate methods for solving engineering problems, considering their environmental and societal implications, and select solutions that promote sustainability and societal well-being
				CO5	Function effectively with in a team to develop and implement comprehensive action plans for project execution