MET's IOE BKC,Nashik-03		
Department of Civil Engineering		
FE SEM - I & II		
FE Civil, Course-2024	**COs**	**Course Outcomes**
ESC-104-CVL Engineering Mechanics	CO1	Understand basic concept of forces, moments and couples in two-dimension force system
	CO2	Apply concept of free body diagram for static equilibrium in two-dimension force system
	CO3	Analyze the practical example involving friction and application of two force members
	CO4	Analyze rectilinear and curvilinear motion of particle
	CO5	Apply Newton's second law, work energy and impulse momentum principles for particles
VSE-102 Design Thinking and Idea Lab	CO1	Identify and define problems from a user's perspective and articulate design criteria.
	CO2	Apply empathy and observation to gain insights into user needs and behaviours
	CO3	Generate innovative ideas and solutions through brainstorming and ideation.
	CO4	Prototype and Test Design Solutions to Refine and Improve Them
	CO5	Present and Communicate Design Ideas Effectively Using Visual Aids and Storytelling
	CO6	Collaborate with Peers and Industry Professionals to Address Real-World Design Challenges

MET's IOE BKC,Nashik-03		
Department of Civil Engineering		
SE SEM - III		
SE Civil, Course-2024	**COs**	**Course Outcomes**
PCC-201-CVL Mechanics of Structures	CO1	Understand stress-strain behaviour, apply Hooke's law, and analyze axial stresses, strains and deformations in structures.
	CO2	Analyze shear force & bending moment under various loading conditions.
	CO3	Analyze bending & shear stresses in beams.
	CO4	Apply torsion theory to circular shafts & determine principal stresses in beams.
	CO5	Analyze axially loaded columns and determine slope and deflection of beams.
PCC-202-CVL Surveying	CO1	Understand the concept of linear & angular measurements.
	CO2	Demonstrate the knowledge of leveling for determination of reduced levels of various points on the earth surface.
	CO3	Demonstrate the use of theodolite for the measurement of horizontal and vertical angles.
	CO4	Apply the knowledge of tacheometric method of surveying for the preparation of contour map of a given area by conducting tacheometric survey.
	CO5	Apply various methods of curve setting for setting out the horizontal & vertical curves for highway or railway alignment.
PCC-203-CVL Building Construction and Materials	CO1	Understand Building Construction Technology – Demonstrate knowledge of fundamental building construction concepts, including structural and non-structural components.
	CO2	Explain Conventional Building Materials techniques.
	CO3	Summarize Modern Construction Techniques.
	CO4	Apply Green Building Concepts – Integrate principles of green building planning and sustainable materials into construction projects.
	CO5	Describe Building Bye-laws & Regulations – Interpret and apply building bye-laws, regulations, and drawing standards, particularly in line with UDCPR, Maharashtra State.

MDM-221-CVL Engineering Mathematics - III	CO1	Solve higher order linear differential equations and its applications to model and analyze bending of beams and whirling of shafts.
	CO2	Apply Statistical methods like correlation, regression in analyzing and interpreting experimental Data applicable to reliability engineering and probability theory in testing and quality control.
	CO3	Solve Algebraic & Transcendental equations and System of linear equations using numerical Techniques.
	CO4	Obtain Interpolating polynomials, numerical differentiation and integration, numerical solutions of Ordinary differential equations used in modern scientific computing applicable to Civil engineering.
	CO5	Perform Vector differentiation & integration, Analyze the vector fields and Apply to fluid Flow problems.
EEM-231-CVL Economics for Civil Engineers	CO1	Understand the fundamental economic principles and their application in the construction industry.
	CO2	Analyze the financial aspects of construction projects using financial statements and key metrics.
	CO3	Evaluate the feasibility of construction projects by applying costing concepts and techniques.
	CO4	Apply economic decision-making tools, such as capital budgeting techniques, to assess construction projects and understand the importance of taxation.
VEC 232 CVL Universal Human Values and Professional Ethics	CO1	Recognize the concept of self-exploration as the process of value education and see they have the potential to explore on their own right.
	CO2	Explore the human being as the coexistence of self and body to see their real needs / basic aspirations clearly.
	CO3	Explain the relationship between one self and the other self as the essential part of relationship and harmony in the family.
	CO4	Interpret the interconnectedness, harmony and mutual fulfilment inherent in nature and the entire existence.
	CO5	Draw ethical conclusions in the light of Right understanding facilitating the development of holistic technologies production systems and management models.
SE SEM - IV		
SE Civil, Course-2024	**COs**	**Course Outcomes**
PCC-251-CVL Fluid Mechanics	CO1	Understand fluid properties and concepts of fluid statics and solve problems based on practical applications.

	CO2	Understand fundamentals of fluid kinematics and apply it to solve fluid flow problems.
	CO3	Solve fluid flow problems using Bernoulli's equation.
	CO4	Calculate major and minor losses in the pipe network.
	CO5	Apply the knowledge of uniform flow and depth-energy to solve problems on open channel flow.
PCC-252-CVL Structural Analysis	CO1	Classify different types of structures and determine static and kinematic indeterminacy of beams, frames, and trusses.
	CO2	Analyze statically indeterminate beams, frames, and trusses using the consistent deformation method and unit load method for various loading and support conditions.
	CO3	Apply approximate methods such as Cantilever and Portal methods to analyze multi-storey, two-bay rigid frames.
	CO4	Apply slope-deflection and moment distribution methods to analyze indeterminate beams and rigid jointed frames, including both sway and non-sway conditions.
	CO5	Apply the stiffness method (structure approach) to analyze beams and rigid frames using matrix formulation for systems with up to three degrees of indeterminacy.
PCC-253-CVL Concrete Technology	CO1	Describe the composition, properties, and functions of various ingredients of concrete.
	CO2	Understand standard tests on fresh and hardened concrete and interpret results related to workability, strength, and durability.
	CO3	Design concrete mixes using IS 10262 for various applications, including performance based requirements.
	CO4	Analyze durability concerns in concrete and recommend suitable preventive or mitigation measures.
	CO5	Compare and evaluate advanced concrete, sustainable materials, and smart technologies for modern construction.
MDM-271-CVL Engineering Geology	CO1	Explain about the basic concepts of engineering geology, important rocks, and minerals both in lab and on the fields and their inherent characteristics and their uses in engineering constructions as well as other industry.
	CO2	Exploring the importance of Surveying with reference to modern technologies and also to understand the fundamentals of surface water and Groundwater regime for sustainable of life.
	CO3	Recognize effect of plate tectonics, structural geology and their significance and utility in engineering activities. Incorporate the various methods of survey, to evaluate and interpret geological nature of the rocks present at the foundations of the dams, percolation tanks, tunnels and

		to infer site / alignment/ level free from geological defects.
	CO4	Assess the Importance of geological nature of the site, precautions and treatments to improve the site conditions for dams, reservoir, tunnels and highways.
	CO5	Explain geological hazards and importance.
VSEC-281-CVL Applications of Python	CO1	Apply Python programming to problems in Mechanics of Structures, Fluid Mechanics, and Concrete Technology by computing structural responses, analyzing fluid flow parameters, and performing statistical and graphical analysis of material properties.
	CO2	Develop Python-based estimators and validation tools in Building Construction and Materials to calculate quantities of materials, verify building dimensions, and simulate construction-related calculations based on IS codes and best practices.
	CO3	Use Python for surveying computations and plotting by implementing algorithms for traverse adjustment, contour generation, and curve setting-out, and for economic analysis in Civil Engineering Economics through break-even analysis, NPV calculation, and simulation methods.
	CO4	Automate project planning and predictive modeling in Project Management and General Applications by generating Gantt charts, identifying critical paths, and building regression models to forecast key civil engineering parameters like strength, deflection, and pressure loss.
AEC-282-CVL Modern Indian Language (Marathi)	CO1	प्रगत भाषिक कौशल्यांची क्षमता विकसित करणे
	CO2	प्रसारमाध्यमांतील संज्ञामधील स्वरूप आणि स्थान स्पष्ट करणे.
	CO3	व्यक्तिमत्त्व विकास आणि भाषा यांच्यातील सहसंबंध स्पष्ट करणे.
	CO4	लोकशाहीतील जीवनव्यवहार आणि प्रसारमाध्यमे यांचे परस्पर संबंध स्पष्ट करणे.
	CO5	प्रसारमाध्यमांसाठी लेखनक्षमता विकसित करणे.
EEM-283-CVL Project Management	CO1	Describe project life cycle and the domains of project management.
	CO2	Explain networking methods and their applications in planning and management.
	CO3	Categorize the materials as per their annual usage and also calculate production rate of construction equipment.
	CO4	Demonstrates resource allocation techniques and apply it for manpower planning.
	CO5	Apply the methods of project selection and recommend the best economical project.

VEC-284-CVL Environmental Awareness	CO1	Apply an integrative and sustainable approach to environmental issues, including understanding organism roles in ecosystem energy transfers.
	CO2	Differentiate renewable and non-renewable resources, assess personal resource consumption, and identify biodiversity threats with strategies for conservation policy.
	CO3	Understand environmental pollution, related scientific principles, relevant laws, and identify violations by industries.
	CO4	Analyze human impacts on the environment, assess conservation challenges, and apply research skills to address real-world environmental issues.