

**AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER**  
**Department of Civil Engineering**  
**Course Outcomes**

<b>Second Year- 2015 Course</b>			
<b>Semester – I</b>			
<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcomes</b>	
<b>At the end of the course, the learners will be able to</b>			
201001	Building Technology and Materials	CO1	Identify types of building and basic requirements of building components.
		CO2	Explain types of masonry, formwork, casting procedure, necessity and applications of underpinning and scaffolding.
		CO3	Explain different types of flooring and roofing materials.
		CO4	Understand concept and types of doors, windows, arches and lintels.
		CO5	Study the means of vertical circulation and protective coatings.
		CO6	Explain different materials especially eco-friendly materials and safety measures to be adopted at any construction site.
201002	Strength of Materials	CO1	Understand concept of stress-strain and determine different types of stress, strain in determinate, indeterminate homogeneous and composite structures.
		CO2	Explain the concept of bending and shear stresses in beams and demonstrate bending and shear stress distribution diagram.
		CO3	Use theory of torsion and determine the stresses, strain and deformation in circular shaft.
		CO4	Describe the concept of principal stresses, strain and determine magnitude, orientation of principal stresses and maximum shear stress.
		CO5	Calculate shear force and bending moment in determinate beams for different loading conditions and illustrate shear force and bending moment diagram.
		CO6	Analyze axially and eccentrically loaded column

201003	Geotechnical Engineering	CO1	Evaluate index properties of soil and classify the soil.
		CO2	Determine permeability of soil and develop an understanding of the influence of water flow on the engineering behavior of soils.
		CO3	Analyze effect of compaction on soil properties and understand stress distribution in soil.
		CO4	Understand the influence of effective stress on soil behavior and determine the soil shear strength.
		CO5	Compute the lateral thrust due to backfill on the retaining walls.
		CO6	Classify soil slopes, identify their modes of failure and recognize the effect of subsurface contamination.
201006	Surveying	CO1	Operate and use surveying equipment, apply the techniques for correcting local attraction.
		CO2	Demonstrate the knowledge of levelling and contouring to evaluate the reduced levels of ground point.
		CO3	Understand construction, handling and use of 20" vernier transit theodolite for different operations in civil engineering projects.
		CO4	Apply the knowledge of tachometry to evaluate the elevations and horizontal distances of inaccessible points.
		CO5	Interpret the different types of curves and its components for design and implementation of setting out of curve
		CO6	Established controls points in construction and use the space based positioning system to appropriate engineering problems.
207001	Engineering Mathematics III	CO1	Find General solution of higher-order linear differential equation with constant & Variable coefficient using different Methods?
		CO2	Solve system of linear equations using direct and iterative numerical techniques and develop solutions to ordinary differential equations using single step and multistep methods applied to structural systems.
		CO3	Understand the different techniques of statistical Analysis, Use of probability and probability distribution
		CO4	Recognize nature of vector fields ,use different vector differential operators& able to evaluate Line, surface & Volume integrals& its application
		CO5	Solve boundary value problems for Laplace's equation, heat equation, the wave equation by separation of variables.

**Semester - II**

201004	Fluid Mechanics 1	CO1	Understand the use of fluid properties, dimensional analysis, and Model Laws for solving problems of fluid flow. (BT Level 1,2,3)
		CO2	Understand basic equation of Hydrostatics, Measurement of fluid pressure, solve problems of fluid statics and analyze the stability of floating bodies. (BT Level 1,2,3,4)
		CO3	Understand the concept of fluid kinematics with reference to Continuity equation and its application to practical problems of fluid flow. (BT Level 1,2,3)
		CO4	Understand the concept of fluid dynamics with reference to Modified Bernoulli's equation and its application to venturimeter, orifice meter and Pitot tube. (BT Level 1, 2,3)
		CO5	Understand the laminar flow through circular pipes, boundary layer and its application to the fluid problems. (BT Level 1, 2,3)
		CO6	Understand the characteristics of turbulent flow and analyze flow through pipes along with its losses.(BT Level 1,2,3,4)
201005	Architectural Planning and Design of Buildings	CO1	Make use of principles of planning in town planning, different village forms and building completion procedure.
		CO2	Make use of an architectural principles and building byelaws to improve the status of existing structures by proposing appropriate green measures.
		CO3	Understand the guidelines and standards of an architectural drawings and safety parameters.
		CO4	Understand the different building services such as an acoustics, ventilation, lighting, plumbing and other services.
		CO5	Plan effectively various types of residential building forms according to their utility, functions with reference to National Building Code.
		CO6	Plan effectively various types of public buildings according to their utility functions with reference to National Building Code.
201007	Concrete Technology	CO1	Understand chemistry, properties, and classification of cement, aggregates and hydration of cement.
		CO2	Identify and test the properties of fresh concrete
		CO3	Identify and test the properties of hardened concrete with destructive and nondestructive testing instruments
		CO4	Get acquainted to concrete handling equipment's and different special concrete types

		CO5	Design concrete mix of desired grade.
		CO6	Predict deteriorations in concrete and repair it with appropriate methods and techniques
201008	Structural Analysis I	CO1	Understand the basic concept of static and kinematic indeterminacy, slope and deflection of determinate and indeterminate beams for analysis of structures.
		CO2	Analyze indeterminate beams and frames by strain energy principles.
		CO3	Recognize determinate and indeterminate trusses and perform its analysis.
		CO4	Apply the knowledge of influence line diagrams for the analysis of structures under moving load.
		CO5	Comprehend the concept of arch and analyze two and three hinged arches.
		CO6	Define the terms related to plastic analysis and calculate the load factor, shape factor and plastic moment for determinate and indeterminate structures.
207009	Engineering Geology	CO1	Understand the physical properties of mineral, the types of rock and their inherent characteristics.
		CO2	Learn & understand structural geology and Plate tectonics
		CO3	Explain geological action of river and Historical geology
		CO4	Study different types of survey for preliminary geological investigation
		CO5	Identify Favorable & Non favorable condition for the dam, tunnel, reservoir
		CO6	State the effect of Ground water, impact of geological hazards and the requirement of good building stone
201010	Soft Skill	CO1	Make use of techniques for self-awareness and self-development.
		CO2	Apply the conceptual understanding of communication into everyday practice
		CO3	Apply business etiquette skills effectively an engineer requires.
		CO4	Understand the importance of teamwork and group discussions skills.
		CO5	Built the leadership and Cultivate leadership qualities
		CO6	Develop time management and stress management.