Sinhgad Institutes

Sinhgad Technical Education Society's

SINHGAD ACADEMY OF ENGINEERING

(Affiliated to University of Pune and Approved by, AICTE, New Delhi.)
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Department of Civil Engineering

Course Outcomes

SEM-I				
Sr.No.	**Class**	**Subject Code**	**Subject Name**	**Course outcomes**
1	**SE**	**201001**	**Building Technology and Architectural Planning**	1. Identify types of building and basic requirements of building components. 2. Make use of Architectural Principles and Building byelaws for building construction. 3. Plan effectively various types of Residential Building forms according to their utility, functions with reference to National Building Code. 4. Plan effectively various types of Public Buildings according to their utility functions with reference to National Building Code. 5. Make use of Principles of Planning in Town Planning, Different Villages and Safety aspects. 6. Understand different services and safety aspects
2	**SE**	**201002**	**Mechanics of Structures**	1. Understand concept of stress-strain and determine different types of stress, strain in determinate, indeterminate homogeneous and composite structures. 2. Calculate shear force and bending moment in determinate beams for different loading conditions and illustrate shear force and bending moment diagram. 3. Explain the concept of shear and bending stresses in beams and demonstrate shear and bending stress distribution diagram. 4. Use theory of torsion to determine the stresses in circular shaft and understand concept of

				Principal stresses and strains. 5. Analyze axially loaded and eccentrically loaded column. 6. Determine the slopes and deflection of determinate beams and trusses.
3	**SE**	**201003**	**Fluid Mechanics**	1. Understand the use of Fluid Properties, concept of Fluid statics, basic equation of Hydrostatics, measurement of fluid pressure, buoyancy & floatation and its application for solving practical problems. 2. Understand the concept of fluid kinematics with reference to Continuity equation and fluid dynamics with reference to Modified Bernoulli's equation and its application to practical problems of fluid flow 3. Understand the concept of Dimensional analysis using Buckingham's π theorem, Similarity & Model Laws and boundary layer theory and apply it for solving practical problems of fluid flow. 4. Understand the concept of laminar and turbulent flow and flow through pipes and its application to determine major and minor losses and analyze pipe network using Hardy Cross method. 5. Understand the concept of open channel flow, uniform flow and depth-Energy relationships in open channel flow and make the use of Chezy's and Manning's formulae for uniform flow computation and design of most economical channel section. 6. Understand the concept of gradually varied flow in open channel and fluid flow around submerged objects, compute GVF profile and calculate drag and lift force on fully submerged body.
4	**SE**	**207001**	**Engineering Mathematics III**	1. Solve Higher order linear differential equations and its applications to modelling and analysing Civil engineering problems such as bending of beams, whirling of shafts and mass spring systems.

				2. Solve System of linear equations using direct & iterative numerical techniques and develop solutions for ordinary differential equations using single step & multistep methods applied to hydraulics, geotechnics and structural systems. 3. Apply Statistical methods like correlation, regression and probability theory in data analysis and predictions in civil engineering. 4. Perform Vector differentiation &integration, analyze the vector fields and apply to fluid flow problems. 5. Solve Partial differential equations such as wave equation, one and two dimensional heat flow equations.
5	**SE**	**207003**	**Engineering Geology**	1. Explain about the basic concepts of engineering geology, various rocks, and minerals both in lab and on the fields and their inherent characteristics and their uses in civil engineering constructions. 2. Exploring the importance of mass wasting processes and various tectonic processes that hampers the design of civil engineering projects and its implications on environment and sustainability. 3. Recognize effect of plate tectonics, structural geology and their significance and utility in civil engineering activities. 4. 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. 5. Assess the Importance of geological nature of the site, precautions and treatments to improve the site conditions for dams, reservoirs, and tunnels. 6. Explain geological hazards and importance of ground water and uses of common building stones.
6	**SE**		**Awareness to Civil Engineering Practices**	1.Describe functioning/working of different types of industries/sectors in Civil Engineering. 2.Describe drawings and documents required and used in different Civil Engineering works.

			Audit Course I	3.Understand the importance of Code of Ethics to be practiced by a Civil Engineer and also 4.Understand the duties and responsibilities as a Civil Engineer. 5.Understand different health and safety practices on the site.
7	**SE**		**Road Safety Management Audit Course I**	1. Summarize the existing road transport scenario of our country 2. Explain the method of road accident investigation 3. Describe the regulatory provisions needed for road safety 4. Identify the safety issues for a road and make use of IRC's road safety manual for conducting road safety audit.
SEM II				
1	**SE**	**201008**	**Geotechnical Engineering**	1. Identify and classify the soil based on the index properties and its formation process 2. Explain permeability and seepage analysis of soil by construction of flow net. 3. Illustrate the effect of compaction on soil and understand the basics of stress distribution. 4. Express shear strength of soil and its measurement under various drainage conditions. 5. Evaluate the earth pressure due to backfill on retaining structures by using different theories. 6. Analysis of stability of slopes for different types of soils.
2	**SE**	**201009**	**Surveying**	1. Define and Explain basics of plane surveying and differentiate the instruments used for it. 2. Express proficiency in handling surveying equipment and analyse the surveying data from these equipment. 3. Describe different methods of surveying and find relative positions of points on the surface of earth. 4. Execute curve setting for civil engineering projects such as roads, railways etc. 5. Articulate advancements in surveying such as

				space based positioning systems 6. Differentiate map and aerial photographs, also interpret aerial photographs.
3	**SE**	**201010**	**Concrete Technology**	1. Able to select the various ingredients of concrete and its suitable proportion to achieved desired strength. 2. Able to check the properties of concrete in fresh and hardened state. 3. Get acquainted to concreting equipments, techniques and different types of special concrete. 4. Able to predict deteriorations in concrete and get acquainted to various repairing methods and techniques.
4	**SE**	**201011**	**Structural Analysis**	1. Understand the basic concept of static and kinematic indeterminacy and analysis of indeterminate beams. 2. Analyze redundant trusses and able to perform approximate analysis of multi-story multi-bay frames. 3. Implement application of the slope deflection method to beams and portal frames. 4. Analyze beams and portal frames using moment distribution method. 5. Determine response of beams and portal frames using structure approach of stiffness matrix method. 6. Apply the concepts of plastic analysis in the analysis of steel structures.
5	**SE**	**201012**	**Project Management**	1. Describe project life cycle and the domains of Project Management. 2. Explain networking methods and their applications in planning and management 3. Categorize the materials as per their annual usage and also Calculate production rate of construction equipment 4. Demonstrates resource allocation techniques and apply it for manpower planning. 5. Understand economical terms and different laws associated with project management 6. Apply the methods of project selection and

				recommend the best economical project.
6	**SE**	**201017**	**Project Based Learning**	1. Identify the community/ practical/ societal needs and convert the idea into a product/ process/ service. 2. Analyse and design the physical/ mathematical/ ICT model in order to solve identified problem/project. 3. Create, work in team and applying the solution in practical way to specific problem.

SEM-I				
1	**TE**	**301001**	**Hydrology and water resource engineering.**	1.Various components of hydrologic cycle that affect the movement of water in the earth 2.Various Stream flow measurements technique 3.The concepts of movement of ground water beneath the earth 4.The basic requirements of irrigation and various irrigation techniques, requirements of the crops 5.Basic components of reservoir planning works. 6.Apply mathematics, science, and technology in the field of water resource Engineering
2	**TE**	**301002**	**Infrastructure Engineering and Construction Techniques**	1.To understand the meaning and scope of Infrastructure Engineering, basic concepts of Railway Engineering. 2.To understand and study the various details of Railway Engineering. 3.To understand and study the various Construction Techniques. 4.Get acquainted Tunneling construction methods. 5.To study the various types of Docks & Harbors. 6.To know and understand the various Construction Equipments.
	TE	**301003**	**Structural Design-I**	1.Student should able to understand the Philosophy of limit state design & To understand the design of various Tension members.

3				2.Student should able to understand the design of various Compression members in steel Structure. 3.Student should able to understand the design of various column bases in steel Structure 4.Student should able to understand the design of Beam and beam to column. 5.Student should able to understand the design of Welded plate girder in steel Structure 6.Students are able to acquire the knowledge and skill of analyzing different Types of Trusses and design.
4	**TE**	**301004**	**Structural Analysis-II**	1. Graduates should understand analysis of beams and frames by slope and deflection method 2. Graduates should understand analysis of beams and portal frames by moment distribution method 3. Graduates should be able to learn fundamental concepts of flexibility method of analysis 4. Graduates should learn about the fundamental concepts of stiffness method of analysis 5. To learn Finite Difference Method & Approximate methods of analysis of multi-storied 6. Graduates should analysis Finite element method & shape functions
5	**TE**	**301005**	**Fluid Mechanics-II**	1.Study the flow around the Streamlined Structure 2.Understand the concept for open channel section and criteria for Economical section 3.Design of hydraulic parameter of Open channel 4.Design and understand the capacity of pump and its functioning 5.Design and understand the capacity of Turbine and its functioning 6.Understand concept and design energy dissipation of GVF and RVF
SEM II				
1	**TE**	**301007**	**Advanced Surveying**	1. Student should able to understand the concept of trigonometric levelling and should able to apply various corrections with handling the instrument.

				2. Student should able to use Nautical Sextant to measure angles on field. 3. Student should able to understand concepts of Aerial photogrammetry and remote sensing and adjustment of geodetic quadrilateral.
2	**TE**	**301008**	**Project Management and Engineering Economics**	1. Enable them to formulate and analyze project management and engineering economics problems 2. To enable them to plan and schedule the projects 3. To aware about various resources available and to plan site while considering various parameters 4. To explain them concept of project monitoring and controlling 5. To learn the concepts of economics and enable them to use in projects. 6. To describe project appraisal and various terminologies associated with it.
3	**TE**	**301009**	**Foundation Engineering**	1. Identify a suitable foundation system for a structure. 2. Evaluate the importance of raft foundation and principles of design for buildings and tower structures. 3. Analyse and design pile foundations. 4. Examine and discuss various machine foundations 5. Analyse and design Sheet piles and cofferdams.
4	**TE**	**301010**	**Structural Design-II**	1. Able to know about various design philosophy in RC structure 2. Able to design the one way slab and will know about the design philosophy of rectangular RC section 3. Able to design the two way slab and staircase 4. Able to design the flexural member for flexure 5. Able to design the flexural member for shear bond and torsion and will know about the redistribution of moments in RC beam 6. Able to design short column and isolated footing
5	**TE**	**301011**	**Environmental**	1. Know about Noise Pollution, Air Pollution and Solid Waste Management.

			Engineering -I	2. Know about Water supply scheme and quality and demand of water. 3. Understand the principles of water treatment operations and processes (Aeration and sedimentation). 4. Understand the principles of Coagulation, Flocculation and Filtration. 5. Understand the mechanism of Disinfection and Water softening. 6. Understand the Water distribution system and Rainwater harvesting.

SEM I				
1	**BE**	**401001**	**Environmental Engineering II**	1. Define objectives, explain collection and conveyance and to estimate quantity of wastewater. 2. Describe wastewater characteristics; explain preliminary and primary treatment processes and its design along with effluent standards. 3. Explain the processes of biological treatment units for wastewater 4. Describe low cost treatments, disposal methods and self-purification capacity of the stream 5. Explain air pollution sources, effects and control measures. 6. Define Environmental Impact Assessment, explain its methods and understand latest trend
2	**BE**	**401002**	**Transportation Engineering**	1. To comprehend the concepts of road development, road alignment and preparation of highway project. 2. To design cross section elements, sight distance, horizontal and vertical alignment. Study, analysis and design of curves and grades. 3. To implement traffic studies, traffic regulations and control, and intersection design

				4. To be aware of pavement materials and their properties. 5. To become familiar with Design flexible and rigid pavements. 6. To Understand the principles of construction and maintenance of highways
3	**BE**	**401 003**	**Structural Design and Drawing III**	1. Application of different specification of IS-1343:2012 for prestressed concrete 2. Able to differentiate between pretensioning and post tensioning systems 3. Safely achieved by varying the sections that is proving thin slabs and avoiding beams. 4. Understand and designing of soil retaining structures. 5. Understand and design of liquid retaining structures. 6. Able to analyse and design framed structures, Application of IS 1893 for earthquake resistant design of structures.
4	**BE**	**401004**	**ARCHITECTURE AND TOWN PLANNING**	1. Graduates should gain and understand basic concepts of town planning. 2. Graduates should be able to understand landscape architecture. 3. Graduates should be able to understand the concept of urban design, sustainable development and city development. 4. Graduates should able to understand the planning agencies and traffic transportation system. 5. Graduates should be able to understand smart city approach
5	**BE**	**401004**	**Advanced Concrete Technology**	1. To understand the basic concepts of Cement & Concrete. 2. To understand and study the various types of special Concrete. 3. To understand and study the Mix design of special concrete. 4. To study the basic concept of fibre reinforced concrete 5. To study the various special fibre reinforced concrete.

				6.To know and understand the various properties of Ferrocement.
6	**BE**	**401 005**	**Total Quality Management**	1.To understand the concept of Quality 2.To understand the Implication of Quality on Business 3.To Implement Quality Implementation Programs 4.To have exposure to challenges in Quality Improvement Programs
SEM II				
1.	**BE**	**401007**	**Dams and Hydroulic structure**	1. Graduate should understand importance of dam, social issue, climatic effects and health monitoring of dams. 2. Student should able to design, analyze gravity dam, spillways and design the same, operation of gates. 3. Student should gain the field knowledge of spillway and operation of gates and design. 4. Student should understand the necessarily of earthen dams and its design. 5. Student should get knowledge with various hydraulic structures such as canals, river training works.
2	**BE**	**401008**	**Quantity Surveying, Contracts and tenders**	1.Student should able to understand the purpose of estimating and mode of measurements. 2.Student should able to understand the methods of taking out quantities using IS 1200 rules. 3.Student should able to understand the specifications and analysis of rates. 4.Student should able to evaluate values of building. 5.Student should able to understand and fill tenders. 6.Student should able to understand the contracts and conditions of contracts.
3	**BE**	**401 009**	**Air Pollution and Pollution**	1. Introduction of major problems in indoor air pollution and control, regulations 2. Familiar with regulations pertinent to air pollutions

				3. Describe general air pollution problems, meteorological definitions, air transport equations and pollution control matters and devices 4. The contents involved the knowledge of causes of air pollution. 5. The contents involved the knowledge of health related to air pollution. 6. To develop skills relevant to control of air pollution.
4	**BE**	**401 010**	**Construction Management**	1. To apply business and management skills in positions within the construction industry. 2. To apply technical skills and knowledge in mathematics, science, construction, and technology in support of planning, analyzing, and solving construction problems. 3. To use industry resources including associations and organizations, professional publications, and governmental data to analyze, evaluate, and apply current trends within the industry. 4. To manage a quality construction project from start to completion while maintaining budget, schedule, and safety requirements.. 5. To analyze, evaluate, and select computer applications for the purpose of efficient and effective project management.