AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER

Department of Civil Engineering

Course Outcomes

Fourth Year- 2012 Course			
Semester - I			
Course Code	**Course Name**	**Course Outcomes**	
At the end of the course, the learners will be able to			
401 001	**Environmental Engineering -II**	CO1	Study various parameters of sewage quality, Analyse and Evaluate quantity of sewage, & design of sewer
		CO2	Understand various units of sewage treatment, working principles as well as design of Screen and Grit Chamber
		CO3	Demonstrate the working principles and Design of Activated sludge process and trickling filter
		CO4	Discuss the working principles and design of low cost treatment units
		CO5	Describe and employ suitable onsite sanitation treatment system.
		CO6	Compare and recommend Appropriate treatment techniques for industrial waste water
401002	**Transportation Engineering**	CO1	Understand the role of transportation, scope of transportation, and historical development of highways.
		CO2	Analyze the different factors of geometrical design of highways.
		CO3	Discuss the concept of traffic engineering and suggest the control
		CO4	Determine the properties of highway materials & perform various tests on aggregates & bitumen.
		CO5	Summarize the concept of design of flexible & rigid pavement.
		CO6	Study the modern trends of highway materials, construction & maintenance.

401 003	**Structural Design and Drawing III**	CO1	Understand the various design Pre-tensioning and Post-tensioning systems of structures.
		CO2	Analyze and design of the post tensioned slab
		CO3	Analyze and Design of the prestressed two way flat slab by direct design method.
		CO4	Analyze and design of the RCC cantilever type retaining wall.
		CO5	Analyze and Design the circular, square, and rectangular water tanks resting on ground
		CO6	Understand single and multi-degree of freedom systems and estimate the internal forces of G+2 storied frame under vertical and lateral loading.
401004 D	**Elective I: Architecture and Town Planning**	CO1	Make use of principles of architectural planning and understand futuristic need of users.
		CO2	Improve the status of existing structure by proposing sustainable architectural planning
		CO3	Understand and demonstrate planning strategy with their utility with reference to different acts, guidelines, norms and design a new area.
		CO4	Analyze the organization of different planning agencies and use various types of civic survey for preparation of any plan.
		CO5	Identify issues and challenges of highly urbanized area and resolve issues by intelligent multidimensional functional levels.
		CO6	Use different planning strategy with respect to their function, application and limitation.
401005 C	**Elective II: TQM & MIS in Civil Engineering**	CO1	Understand prerequisites of evolution of total quality management and to study the significance of quality gurus.
		CO2	Understand and apply QFD and Six sigma techniques for achieving Quality in various activities involved in project.
		CO3	Understand ISO 9001 principles and quality manual for various constructing activities
		CO4	Understand Benchmarking in TQM, COQ & CONQAS, and CIDC-CQRA certifications.
		CO5	Applying Concept of Kaizen's 5S technique FMEA & Zero Defects.
		CO6	Understand Management Information systems associated with building works

401005 A	**Elective II: Matrix Method of Structural Analysis**	CO1	Compute the solution of equations in matrix form for better understanding of algorithm and flow chart
		CO2	Calculate the structural indeterminate actions of beams & rigid jointed frames by force approach of flexibility method.
		CO3	Learn the concept of displacement technique through stiffness method and its use for calculating the structural unknown forces of bars, springs and trusses
		CO4	Understand the concept of displacement method through direct stiffness and indirect stiffness techniques for beams under static loads for performing analysis.
		CO5	Analyze the rigid jointed portal frame by member and structure approach of stiffness matrix method
		CO6	Comprehend the concept of grid structure and perform its analysis using structure and member approach of displacement method by assembling the stiffness matrices
401006	**Project Phase I**	CO1	Identify the new concept/ problem statement in society for improving day today situations.
		CO2	Study the literature related to given situation by establishing method of new approach with considering future needs.
		CO3	Develop flow chart and methodology /alternatives methods for simplifying the arriving problem.
		CO4	Analyses and develop best engineering practice regarding safety, durability, environmental and economical parameters.
		CO5	Demonstrate the working, prototype, mathematical model, software for practical solution.
		CO6	Preparation of project report based on findings and presenting it towards competent authority.
Semester - II			
401007	**Dams and Hydraulic Structures**	CO1	Explain the site selection criteria and different instruments required for dam construction.
		CO2	Evaluate the structural stability of gravity dam under different loading conditions and explain different types of arch dams, buttress dams.
		CO3	Illustrate different types of spillways, spillway gates and design ogee spillway with energy dissipation below spillway.

		CO4	Evaluate structural stability of homogeneous earthen dam and analyse , design the stability of weir on permeable foundation
		CO5	Explain different types of canals, canal structures and design of canal.
		CO6	Understand the classification and necessity of different types of cross drainage works and river training structures
401008	**Quantity Surveying, Contracts and Tenders**	CO1	Prepare the estimate of road work, water supply and sanitation work.
		CO2	Form the measurement and abstract sheets for various structures.
		CO3	Perform the rate analysis and define the specifications of various materials.
		CO4	Carry out valuation of properties by different methods.
		CO5	Understand and execute the tendering process.
		CO6	Study the contract procedure, arbitration and conciliation act.
401009 B	**Elective III: Statistical Analysis and Computational Methods in Civil Engineering**	CO1	To learn the numerical methods and techniques used in civil engineering.
		CO2	Understand and apply numerical integration techniques related to civil engineering problem.
		CO3	Learn and understand the different optimization techniques concepts.
		CO4	Study different statistical methods of civil engineering.
		CO5	Learn probability and probability distribution technique for the solving the problem of civil engineering.
		CO6	Correlation analysis and regression analysis to determine the relationships between variables and using these relationships to forecast future observations
401009 D	**Elective III: Air Pollution and control**	CO1	Understand Meteorology, Identify air pollution problems and evaluate stack height.
		CO2	Apply different sampling techniques and Analyze air samples by chemical and instrumental methods.
		CO3	Discuss and understand indoor and odor pollution problems by different methods.
		CO4	Understand principles and demonstrate working of control equipments.
		CO5	Understand legislation and regulation in air pollution

		CO6	Identify and evaluate environmental impacts
401009 E	**Elective III: Finite Element Method in Civil Engineering**	CO1	To understand concepts and principles of the classical theory of solid mechanics prior before to learn the Finite Element Method.
		CO2	To obtain an understanding of the fundamental theory of the FEA method and its use for the formulation of stiffness matrix of truss element by variational principle.
		CO3	To Develop element characteristic equation for 1D and 2D FE Elements as per use of polynomial functions and generate the global equation for these elements.
		CO4	Be able to derive and formulate the equations in finite element methods for 1D, 2D and 3D problems.
		CO5	To formulate and analyze spring, truss and beam problems by member approach stiffness matrix method.
		CO6	Able to apply suitable boundary conditions to form a global equation for portal frame and grid problem and solve them for unknown displacements and forces.
401010 A	**Elective IV: Construction Management**	CO1	Understand the role of construction industry and construction management.
		CO2	Study the construction project scheduling and use it for construction planning.
		CO3	Comprehend the labour laws and financial aspects of construction projects.
		CO4	Knowledge of elements of risk management and value engineering.
		CO5	Plan the activities for material requirement, human resource in construction sector, material procurement for best suitable ERP also Define EOQ model Know Human Resource in Construction Sector
		CO6	Accomplish & determine the Basic terminologies and applications of artificial intelligence technique in civil Engineering.
401010 E	**Elective IV: Ferrocement Technology**	CO1	Understand concept of ferrocement, raw materials required and its properties.
		CO2	Learn the properties and construction methods of ferrocement.
		CO3	Design ferrocement structures and strength through shape
		CO4	Prepare cost analysis of ferrocement structures and its use in building construction.
		CO5	Apply ferrocement as a construction material in different field of civil engineering.
		CO6	Use ferrocement in space structures and as a precast products.