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Vision

Imparting quality education in civil engineering to meet the needs of the industry and society

Mission

M1- To develop Civil Engineers having knowledge, attitude and skills for planning, designing and execution of construction project with quality and economy

M2- To develop Civil Engineering department as a research and development center for solving the problems of industry and society

M3- To provide testing and consultancy services in Civil Engineering for improvement of industry-institute interaction and continuous improvement of academics to meet the needs of industry

Program Educational Objectives-

PEO 1- To develop the professional skills, team work and self-employment culture among the engineering graduates

PEO 2- To develop the professional approach among civil engineering graduates for analysis, design and construction of technically sound, economically feasible civil engineering works

PEO 3- To acquire excellence in civil engineering education, research and professional practices

Program Specific Outcomes

After successful completion of the course students will be able

PSO1- To plan, analyse, design and prepare drawings of various civil engineering projects as per the needs of an individual and society for sustainable development.

PSO 2- To prepare estimates, cost economics and project management schedule of the civil engineering projects and carry out construction as per design, specifications and drawings.



Program Outcomes (POs):

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



Course Outcomes of all courses

After successful completion of course students will be able to

SE

Course: Building Technology and Architectural Planning

- CO 201001.1 Identify different types of structure and their requirement.
- CO 201001.2 Describe all basic activities of construction.
- CO 201001.3 Study different types of materials, byelaws and Architectural aspects used in construction for civil engineering projects.
- CO 201001.4 Describe Town planning parameters and safety of buildings.
- CO 201001.5 Plan different Public buildings.

Course: Mechanics of Structures

- CO201002 .1 Define concept of stress-strain and determine different types of stress, strain in determinate, indeterminate homogeneous and composite structures.
- CO201002 .2 Illustrate shear force and bending moment in determinate beams for different loading conditions and sketch shear force and bending moment diagram
- CO201002 .3 Apply the concept of shear and bending stresses in beams and demonstrate shear and bending stress distribution diagram.
- CO201002 .4 Apply theory of torsion to determine the stresses in circular shaft and understand concept of Principal stresses and strains.
- CO201002 .5 Analyze axially loaded and eccentrically loaded column.
- CO201002 .6 Evaluate the slopes and deflection of determinate beams and trusses.

Course: Fluid Mechanics

- CO222003 .1 Recall the basic fluid properties and state concepts of buoyancy.
- CO222003 .2 Identify the various pressure measuring devices and explain the various numbers in dimensional analysis.
- CO222003 .3 Discuss the Bernoulli's equation and uses of venturimeter.
- CO222003 .4 Describe Laminar and turbulent flow and recognize its characteristics.
- CO222003 .5 Solve the practical problems involving boundary layer theory and flow through pipes.

Course: Engineering Geology

- CO207009.1 Get knowledge about the basic concepts of engineering geology. Shall also able to differentiate and to relate between the different rock types, their inherent characteristics and uses in civil engineering constructions.
- CO207009.2 Recognition and Identification of rocks on the basis of various physical, mechanical properties of minerals both in lab and on the fields and will learn to differentiate and judge between favorable and unfavorable conditions for the buildings, roads, dams, tunnels etc.



CO207009.3 Estimation of 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.

CO207009.4 Evaluate, analyze and to interpret geo hydrological characters of the rocks present at the foundations of the dams, percolation tanks, tunnels.

CO207009.5 Assessment and Importance of Seismic activities and its effect on the civil engineering construction and be able to map the various geological hazards.

CO207009.6 Managing and trying to get command over the various remote sensing software.

Course: Surveying

CO201006 .1 State the need of surveying for any civil engineering work and operate the various surveying instruments for measurements of bearing and distances.

CO201006 .2 Apply the knowledge of leveling for determination of the elevation of the various points, drawing longitudinal sections and cross sections of alignments.

CO201006 .3 Measure horizontal and vertical angles and determine coordinates.

CO201006 .4 Carry out contour survey and prepare contour maps.

CO201006 .5 Able to work out the elements of different types of curves & its setting out in the field.

CO201006 .6 Collect the data from the SBPS system & setting out the civil engineering work.

Course: Concrete Technology

CO201010 .1 Define concrete as a construction material and get acquainted with the ingredients of concrete like cement, sand, aggregates and admixtures.

CO201010 .2 Discuss the properties of fresh concrete and test the fresh concrete.

CO201010 .3 Classify the properties of hardened concrete with destructive and non destructive testing instruments

CO201010 .4 Identify concrete related equipments and describe various concreting techniques and special concretes.

CO201010 .5 Evaluate deteriorations in concrete and categorize different methods and techniques of repairing it.

Course: Structural Analysis

CO201008.1 Understand the basic concept of static and kinematic indeterminacy and analysis of indeterminate beams.

CO201008.2 Analyze redundant trusses and able to perform approximate analysis of multi-story multi-bay frames

CO201008.3 Implement application of the slope deflection method to beams and portal frames.

CO201008.4 Analyze beams and portal frames using moment distribution method.



- CO201008.5 Determine response of beams and portal frames using structure approach of stiffness matrix method
- CO201008.6 Apply the concepts of plastic analysis in the analysis of steel structures.

Course: Project Management

- CO201012.1 To relate the need and importance of Project Management & organization structure.
- CO201012.2 To illustrate the basics of CPM and PERT networks for finding critical path and time required for the project completion
- CO201012.3 To outline the objective importance and its field application of material management.
- CO201012.4 To make use of various techniques of resource allocation and resource levelling in construction projects
- CO201012.5 To apply the basics of economic in construction project
- CO201012.6 To select the best project using various appraisal methods.

Course: Project Based Learning

- CO201017.1 Identify the community/ practical/ societal needs and convert the idea into a product/ process/service.
- CO201017.2 Analyse and design the physical/ mathematical/ ICT model in order to solve identified problem/project.
- CO201017.3 Create, work in team and applying the solution in practical way to specific problem.

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Course: Design of Steel Structures

- CO301003.1 Identify modes of failure and the nature of different components of steel structures
- CO301003.2 Interpret IS provisions and discuss material behaviour
- CO301003.3 Analyze roof truss subjected to different load combinations
- CO301003.4 Design axially/ eccentrically loaded column with suitable type of column base
- CO301003.5 Design tension and compression member along with their connections
- CO301003.6 Design beam, gantry girder and welded plate girder along with stiffeners and their connections

Course: Engineering Economics and Financial Management

- CO 301004.1 Describe the use of construction economics in civil engineering projects
- CO301 004 .2 Explain importance of financial management in civil engineering projects
- CO301 004 .3 Understand working capital and its estimation for civil engineering projects
- CO301 004 .4 Demonstrate the importance of tax planning & understand role of financial regulatory bodies



CO301 004.5 Prepare and analyze the contract account

CO301 004 .6 Decide on right source of fund for construction projects.

Course: Elective I (Advanced Concrete Technology)

CO301005.1 Understand the chemistry of cement and its effect on properties of concrete

CO301005.2 Apply the knowledge of supplementary cementitious materials to produce sustainable concretes

CO301005.3 Understand the mechanism of working of admixtures and their effect on properties of concrete

CO301005.4 Evaluate the characteristic properties of fiber reinforced concrete

CO301005.5 Understand the durability properties of concrete

CO301005.6 Interpret the properties of concrete through advance testing methods

Course: Elective I (Advanced Mechanics of Structures)

CO301005f.1 Apply moment area and conjugate method to find slope and deflection

CO301005f.2 Evaluate stresses and strain in thin and thick cylinder.

CO301005f.3 Analyze the beam and trusses by influence line diagram.

CO301005f.4 Analyze the beam for moving load by influence line diagram.

CO301005f.5 Understand and analyze beam curved in plan and elevation.

CO301005f.6 Analyze three and two hinged arches for axial thrust, shear and moment

Course: Elective II (Solid Waste Management)

1 Outline solid waste management systems with respect to its generation rate (quantity), sampling, characteristics and regulatory/legal requirements.

2 Explain and suggest relevant method of storage, collection and transportation of solid waste for the given site condition with justification.

3 Develop understanding of technological applications for processing and material recovery from solid waste with its economics and design composting system for organic waste.

4 Describe the fundamental and technological aspects of waste to energy systems from solid waste and to design anaerobic digester and incineration system.

5 Outline the design, operation, and maintenance of sanitary landfill and management of legacy waste

6 Explain the functional element for management of special waste and suggest the relevant method of reuse and recycling for the given type of waste in the given situation

BE

Course: Transportation Engineering

1 Understand principles and practices of transportation planning.



- 2 Demonstrate knowledge of traffic studies, analysis and their interpretation.
- 3 Design Geometric Elements of road pavement.
- 4 Evaluate properties of highway materials as a part of road pavement.
- 5 Appraise different types of pavements and their design.
- 6 Understand the fundamentals of Bridge Engineering and Railway Engineering

Course: Elective IV (Air Pollution and Control)

- 1 Recall air pollution, legislation and regulations
- 2 Evaluate air pollutant concentrations as a function of meteorology.
- 3 Interpret sampling results with prescribed standards.
- 4 Assess emission inventory and air quality models.
- 5 Compare the air pollution control equipments.
- 6 Infer indoor air pollution and its mitigation

Course: Elective III (Operation Research)

- CO401004 1. Discuss the application of various Optimization Techniques through systems approach to civil engineering project.
- CO401004 2. Compute the elapsed time and idle time for various engineering processes.
- CO401004 3. Apply concept of Transportation and Assignment Model to compute the cost of an optimum route between various sources and destination.
- CO401004 4. Formulate linear optimization models for Civil engineering problems and obtain optimum solution.
- CO401004 5. Apply appropriate nonlinear programming techniques to obtain optimum solution
- CO401004 6. Predict cost and profit of strategy using dynamic programming and game theory and assess the useful life using replacement model technique.

Course: Computer Programming in Civil Engineering

- 1 Understand basics of Python Programming
- 2 Write Python codes for variety of problems in civil Engineering

Course: Dams and Hydraulics Structures

- CO401007 .1 Identify different types of dam and know its component part. Make aware with classification of dams through field visit. Application of pressure measuring device in Health monitoring of dam
- CO401007.2 Design gravity dam. Conduct stability analysis of gravity dam. Explain concept of arch & buttress dam
- CO401007.3 Design of spillway. Design Energy Dissipation device. Explain Concept of Hydro power plant
- CO401007 .4 Design of spillway and able know its application. Design the weirs on permeable foundation



- CO401007 .5 Introduce the types of canals. Design canal and lined canal
CO401007 .6 Demonstrate various types of C D works and canal structures through field visit.

Course: Quantity Surveying, Contracts and Tenders

- CO401008 .1 State different types of estimates in civil engineering and understand the methods for measurement of building works.
CO401008 .2 Describe PWD procedure for execution of major/minor work, details required in tender notice and tender documents for execution of major / minor construction works.
CO401008 .3 Explain different types of contracts, various conditions of contracts for execution of civil engineering works and arbitration methods in civil engineering.
CO401008 .4 Prepare approximate and detailed estimate of different types of civil engineering works.
CO401008 .5 Determine the rate per unit of measurement for various construction items and compose the detailed specifications for various items.
CO401008 .6 Evaluate depreciation and value of a property on the basics of present condition, specifications and market trend.

Course: Project Stage

- CO401005 .1 Appraise the current Civil Engineering research/techniques/developments/interdisciplinary areas.
CO401005 .2 Review and organize literature survey utilizing technical resources, journals etc.
CO401005 .3 Evaluate and draw conclusions related to technical content studied.
CO401005 .4 Demonstrate the ability to perform critical writing by preparing a technical report.
CO401005 .5 Develop technical writing and presentation skills.