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Civil Engineering

Course Outcomes

Second Year Engineering

Course code and Name: 201001-Building Technology and Architectural Planning

201001.1	Identify types of building and basic requirements of building components.
201001.2	Make use of Architectural Principles and Building byelaws for building construction.
201001.3	Plan effectively various types of Residential Building forms according to their utility, functions with reference to National Building Code.
201001.4	Plan effectively various types of Public Buildings according to their utility functions with reference to National Building Code.
201001.5	Make use of Principles of Planning in Town Planning, Different Villages and Safety aspects.
2.01001.6	Understand different services and safety aspects

Course code and Name: 201002 - Mechanics of Structures

201002.1	Understand concept of stress-strain and determine different types of stress, strain in determinate, indeterminate homogeneous and composite structures.
201002.2	Calculate shear force and bending moment in determinate beams for different loading conditions and illustrate shear force and bending moment diagram.
201002.3	Explain the concept of shear and bending stresses in beams and demonstrate shear and bending stress distribution diagram.
201002.4	Use theory of torsion to determine the stresses in circular shaft and understand concept of Principal stresses and strains.

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201002.5	Analyze axially loaded and eccentrically loaded column.
201002.6	Determine the slopes and deflection of determinate beams and trusses.

Course Code and Name: 201003 - Fluid Mechanics

201003.1	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.
201003.2	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
201003.3	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
201003.4	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.
201003.5	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.
201003.6	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.

Course code and Name: 207003 - Engineering Geology

207003.1	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.
207003.2	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.
207003.3	Recognize effect of plate tectonics, structural geology and their significance and utility in civil engineering activities.
207003.4	Incorporate the various methods of survey, to evaluate and interpret geological nature of therocks present at the foundations of the dams, percolation tanks, tunnels and to infer site / alignment/ level free from geological defects.

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003.5	Assess the Importance of geological nature of the site, precautions and treatments to improve the site conditions for dams, reservoirs, and tunnels.
207003.6	Explain geological hazards and importance of ground water and uses of common building stones.

Course Code and Name: 201008-Geotechnical Engineering

201008.1	Identify and classify the soil based on the index properties and its formation process.
201008.2	Explain permeability and seepage analysis of soil by construction of flow net.
201008.3	Illustrate the effect of compaction on soil and understand the basics of stress distribution.
201008.4	Express shear strength of soil and its measurement under various drainage conditions.
201008.5	Evaluate the earth pressure due to backfill on retaining structures by using different theories.
201008.6	Analysis of stability of slopes for different types of soils.

Course Code and Name : 201009-Surveying

201009.1	Define and Explain basics of plane surveying and differentiate the instruments used for it.
201009.2	Express proficiency in handling surveying equipment and analyse the surveying data from these equipment.
201009.3	Describe different methods of surveying and find relative positions of points on the surface of earth.
201009.4	Execute curve setting for civil engineering projects such as roads, railways etc.
201009.5	Articulate advancements in surveying such as space based positioning systems
201009.6	Differentiate map and aerial photographs, also interpret aerial photographs.

Course code and Name: 201010 - Concrete Technology

201010.1	Able to select the various ingredients of concrete and its suitable proportion to achieved desired strength
201010.2	Able to check the properties of concrete in fresh and hardened state.
201010.3	Get acquainted to concreting equipments, techniques and different types of special concrete.
201010.4	Able to predict deteriorations in concrete and get acquainted to various repairing methods and techniques.

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Course Code and Name: 201011-Structural Analysis

201011.1	Understand the basic concept of static and kinematic indeterminacy and analysis of indeterminate beams.
201011.2	Analyze redundant trusses and able to perform approximate analysis of multi-story multi-bay frames.
201011.3	Implement application of the slope deflection method to beams and portal frames.
201011.4	Analyze beams and portal frames using moment distribution method.
201011.5	Determine response of beams and portal frames using structure approach of stiffness matrix method.
201011.6	Apply the concepts of plastic analysis in the analysis of steel structures.

Course Code and Name: 201012-Project Management

201012.1	Describe project life cycle and the domains of Project Management.
201012.2	Explain networking methods and their applications in planning and management
201012.3	Categorize the materials as per their annual usage and also Calculate production rate of construction equipment
201012.4	Demonstrates resource allocation techniques and apply it for manpower planning.
201012.5	To design and realize linear phase digital FIR filters using different techniques, viz. frequency sampling technique and use of an appropriate window function
201012.6	Apply the methods of project selection and recommend the best economical project.

Course Code and Name: 201017- Project Based Learning

201017.1	Identify the community/ practical/ societal needs and convert the idea into a product/ process/ service
201017.2	Analyze and design the physical/ mathematical/ ICT model in order to solve identified problem/ project.
201017.3	Create, work in team and applying the solution in practical way to specific problem.

Third Year Engineering

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Course code and Name: 301001 Hydrology and Water Resource Engineering

301001.1	To impart the knowledge of various irrigation techniques
301001.2	To learn about distribution systems for canal irrigation
301001.3	To impart the knowledge of various irrigation techniques
301001.4	Distribution systems for canal irrigation and the basics of design of unlined and lined irrigation canals design
301001.5	Various components of hydrologic cycle that affect the movement of water in the earth
301001.6	Various Stream flow measurements technique.

Course code and Name: 301002: Water Supply Engineering

301002.1	01 Define identify, describe reliability of water sources, estimate water requirement for various sectors
301002.2	02 Ascertain and interpret water treatment method required to be adopted with respect to source and raw water characteristics
301002.3	03 Design various components of water treatment plant and distribution system
301002.4	04 Understand and compare contemporary issues and advanced treatment operations and process available in the market, including packaged water treatment plants

Course Code and Name: 301003: Design of Steel Structures

301003.1	Demonstrate knowledge about the types of steel structures, steel code provisions and design of the adequate steel section subjected to tensile force.
301003.2	Determine the adequate steel section subjected to compression load and design of built up columns along with lacing and battening
301003.3	Design eccentrically loaded column for section strength and column bases for axial load and uniaxial bending.
301003.4	Design of laterally restrained and unrestrained beam with and without flange plate using rolled steel section.
301003.5	Analyze the industrial truss for dead, live and wind load and design of gantry girder for moving load.

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301003.6	Understand the role of components of welded plate girder and design cross section for welded plate girder including stiffeners and its connections..

Course Code and Name: 301004: Engineering Economics and Financial Management

301004.1	Understand basics of construction economics.
301004.2	Develop an understanding of financial management in civil engineering projects
301004.3	Prepare and analyze the contract account.
301004.4	Decide on right source of fund for construction projects.
301004.5	Understand working capital and its estimation for civil engineering projects
301004.6	Illustrate the importance of tax planning & understand role of financial regulatory bodies

Course Code and Name: 301005 d: Elective I: Advanced Concrete Technology

301005.1	Understand the chemistry of cement and its effect on properties of concrete
301005.2	Apply the knowledge of supplementary cementitious materials to produce sustainable concretes
301005.3	Understand the mechanism of working of admixtures and their effect on properties of concrete
301005.4	Evaluate the characteristic properties of fiber reinforced concret
301005.5	Understand the durability properties of concrete
301005.6	Interpret the properties of concrete through advance testing methods

Course Code and Name:301012 Waste Water Engineering

301012..1	Recall sanitation infrastructure, quantification and characterization of wastewater, natural purification of streams
301012.2	Design preliminary and primary unit operations in waste water treatment plant

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301012.3 Understand theory and mechanism of aerobic biological treatment system and to design activated sludge process

301012.4 Understand and design suspended and attached growth wastewater treatment systems

Course Code and Name: 301013: Design of Reinforced Concrete Structures

301013.1 Apply relevant IS provisions to ensure safety and serviceability of structures, understand the design philosophies and behavior of materials: steel & concrete.

3010132 Recognize mode of failure as per LSM and evaluate moment of resistance for singly, doubly rectangular, and flanged sections.

301013.3 Design & detailing of rectangular one way and two-way slab with different boundary conditions

301013.4 Design & detailing of dog legged and open well staircase

301013.5 Design & detailing of singly/doubly rectangular/flanged beams for flexure, shear, bond and torsion.

Course Code and Name: 301014: Remote Sensing and Geographic Information System

301014.1 Articulate fundamentals and principles of RS techniques.

301014.2 Demonstrate the knowledge of remote sensing and sensor characteristics.

301014.3 Distinguish working of various spaces-based positioning systems.

301014.4 Analyze the RS data and image processing to utilize in civil engineering

Course Code and Name: 301015 f: Elective II: Solid Waste Management

301015.1 Outline solid waste management systems with respect to its generation rate (quantity), sampling, characteristics and regulatory/legal requirements.

301015.2 Explain and suggest relevant method of storage, collection and transportation of solid waste for the given site condition with justification.

301015.3 Develop understanding of technological applications for processing and material recovery from solid waste with its economics and design composting system for organic waste.

301015.4 Describe the fundamental and technological aspects of waste to energy systems from solid waste and to design anaerobic digester and incineration system.

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Final Year Engineering

Course code and Name: 401001- Environmental Engineering

401001.1	Design of circular sanitary sewers.
401001.2	Effect of change of life style on sewage quality.
401001.3	Tests of physical, chemical and biological.
401001.4	The self-purification of natural streams
401001.5	Natural river cleaning plan.

Course code and Name: 401002 -Transportation Engineering

401002.1	Understand history of road development, roads classification, traffic Engineering and controlling devices in India.
401002.2	Able to fixation of road alignment, Geometric parameters, and highway drainage system.
401002.3	Able to select different materials for various courses of road, pavement design and construction procedures.
401002.4	Able to do airport planning and designing.
401002.5	Understand different components and loading on bridges.
401002.6	Understand different types of Bridges and bearings of bridges.

Course Code and Name: 401003- Structural Design and Drawing III

401003.1	Able to differentiate between pre-tensioning and post tensioning systems.
401003.2	Application of different specification of IS 1343: 2012 for prestress concrete and can design structural element.
401003.3	Able to analyze and design pre-stress Flat slab.
401003.4	Understand and designing of Soil Retaining structures
401003.5	Application of IS 3370 part II to part IV for water storage structures

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401003.6	Able to analyze and design framed structures, Application of IS1893:2016 for Earthquake resistant design of structures.

Course code and Name: 401004- Elective I- Advanced Concrete Technology

401004.1	Understand chemistry, properties, and classification of cement, fly ash, aggregates and admixtures, and hydration of cement in concrete.
401004.2	Prepare and test the fresh concrete.
401004.3	Test hardened concrete with destructive and nondestructive testing instruments
401004.4	Get acquainted to concrete handling equipments and different special concrete types.
401004.5	Design concrete mix of desired grade.
401004.6	Predict deteriorations in concrete and repair it with appropriate methods and techniques.

Course code and Name: 401005-Elective II -TQM & MIS in Civil Engineering

401005.1	To study the importance of quality in construction.
401005.2	To study MIS and its application in construction.
401005.3	To identify defects and its prevention and TQM philosophy of Six Sigma.
401005.4	Importance of Total Quality Management and ISO in construction.
401005.5	To study applications of TQM and different philosophies like Kaizen, Benching and Supply chain management

Course Code and Name: 401006- Project

401006.1	Identify the community/ practical/ societal needs and convert the idea into a product/ process/ service
401006.2	Analyse and design the physical/ mathematical/ ICT model in order to solve identified problem/project.
401006.3	Create, work in team and applying the solution in practical way to specific problem.

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Course code and Name: 401007 -Dams and Hydraulic Structures

401007.1	Student will be able to understand. Engineers with the ability to prepare different types of CD Work.
401007.2	Student will be the ability to improve the existing dam structures.
401007.3	Student will be able to prepare different types of Hydraulic Projects.
401007.4	To impart the knowledge of various irrigation techniques, requirements of the crops

Course Code and Name: 401008- Quantity surveying, contracts and Tenders

401008.1	To study measurement & Estimation of Quantities, Preparation of Bill of Quantities and Submission of Tenders.
401008.2	To study post Contract Functions, Monthly Valuations and Project Variance Reports
401008.3	To identify claims & Extra Works at sites.
401008.4	To understand proficiency of Information Technology, Finance & People Management Skills.
401008.5	To analyze Competency to handle a project in the specialized construction sector.
401008.6	To understand administration of Contracts, Conciliation Arbitration and Dispute Resolution

Course Code and Name: 401009- Elective III-Hydropower Engineering

401009.1	Students can understand various sources of energy.
401009.2	Students can understand various types of hydropower plant.
401009.3	Students can understand design of power plant.
401009.4	Students are gained the knowledge of power house.

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401009.5 Students can understand design of turbine.

401009.6 Students are made aware about electric act.

Course Code and Name: 401010 Elective IV Construction Management

401010.1 Use industry resources including associations and organizations, professional publications, and governmental data to analyze, evaluate, and apply current trends within the industry.

401010.2 To successfully apply business and management skills in positions within the construction industry.

401010.3 To apply technical skills and knowledge in mathematics, science, construction, and technology in support of planning, analyzing, and solving construction problems.

401010.4 To apply professional and ethical standards of behavior in dealing with all stakeholders in the construction process.

401010.5 To Align the project to the organization's strategic plans and business justification throughout its lifecycle

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Civil Engineering

Program Outcomes:

1. To develop a students for the principles of sustainable development.
2. To develop capability of self learning.
3. To prepare students career in civil engineering to need domestic & an international needs.
4. To develop students to use modern techniques, skills and mathematical engineering tools for solving civil engineering problems
5. To mould the students to analyze real life situations & provide economical and feasible solutions.
6. More use of Information and Communication Technology (ICT) for quality of education.

Program Specific Outcome:

1. Understand economic, Environmental, social health and safety factor in civil Engineering
2. Apply Knowledge in analysis design and survey, testing and construction of civil engineering structure along with knowledge of mathematics soft skill to solve complex civil engineering problem.

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