

Course Name	Course Code	CO No.	Co Statement (On completion of the course, learner will be able to:)
HWRE	301001	C301.1	Understand government organizations, apply & analyze precipitation & its abstractions.
		C301.2	Understand, apply & analyze runoff, runoff hydrographs and gauging of streams.
		C301.3	Understand, apply & analyze floods, hydrologic routing & Q-GIS software in hydrology.
		C301.4	Understand, apply & analyze reservoir planning, capacity of reservoir & reservoir economics.
		C301.5	Understand water logging & water management, apply & analyze ground water hydrology
		C301.6	Understand irrigation, piped distribution network and canal revenue, apply and analyze crop water requirement.
Water Supply Engineering	301002	C302.1	Define identify, describe reliability of water sources, estimate water requirement for various sectors.
		C302.2	Ascertain and interpret water treatment method required to be adopted with respect to source and raw water characteristics
		C302.3	Design various components of water treatment plant and distribution system.
		C302.4	Understand and compare contemporary issues and advanced treatment operations and process available in the market, including packaged water treatment plants.
		C302.5	Design elevated service reservoir capacity and understand the rainwater harvesting.
		C302.6	Understand the requirement of water treatment plant for infrastructure and Government scheme.
Design of Steel Structures	301003	C303.1	Demonstrate knowledge about the types of steel structures, steel code provisions and design of the adequate steel section subjected to tensile force.
		C303.2	Determine the adequate steel section subjected to compression load and design of built up columns along with lacing and battening
		C303.3	Design eccentrically loaded column for section strength and column bases for axial load and uniaxial bending.
		C303.4	Design of laterally restrained and unrestrained beam with and without flange plate using rolled steel section.
		C303.5	Analyze the industrial truss for dead, live and wind load and design of gantry girder for moving load.
		C303.6	Understand the role of components of welded plate girder and design cross section for welded plate girder including stiffeners and its connections.
Engineering Economics and Financial Management	301004	C304.1	Understand basics of construction economics.
		C304.2	Develop an understanding of financial management in civil engineering projects.

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Engineering Economics and Financial Management	301004	C304.3	Prepare and analyze the contract account.
		C304.4	Decide on right source of fund for construction projects.
		C304.5	Understand working capital and its estimation for civil engineering projects.
		C304.6	Illustrate the importance of tax planning & understand role of financial regulatory bodies
Construction Management	301005 c	C305.1	Understand the overview of construction sector.
		C305.2	Illustrate construction scheduling, work study and work measurement.
		C305.3	Acquaint various labor laws and financial aspects of construction projects.
		C305.4	Explain elements of risk management and value engineering.
		C305.5	State material and human resource management techniques in construction.
		C305.6	Understand basics of artificial intelligence techniques in civil
Seminar	301006	C306.1	Appraise the current civil engineering research / techniques / developments / interdisciplinary areas.
		C306.2	Review and organize literature survey utilizing technical resources, journals etc.
		C306.3	Evaluate and draw conclusions related to technical content studied.
		C306.4	Demonstrate the ability to perform critical writing by preparing a technical report.
		C306.5	Develop technical writing and presentation skills.
HWRE (Lab)	301007	C307.1	To understand and analyze the precipitation
		C307.2	To understand, apply and analyze floods and hydrologic routing in hydrology
		C307.3	To understand, apply and analyze reservoir planning and capacity of reservoir
		C307.4	To understand the application of suitable software used in water resources
Water Supply Engineering (lab.)	301008	C308.1	Understand various parameters related to water quality.
		C308.2	Analyze the water quality parameters
		C308.3	Design various components of water treatment plant and distribution system.
Design of Steel Structures (Lab.)	301009	C309.1	To draw drawing sheets consists of steel structural detailing .
		C309.2	To design industrial building including roof truss, purlin, bracings, gantry girder, column, column base and connections as per SP:38 and IS:800-2007.
		C309.3	To design welded plate girder: design of cross section, curtailment of flange plates, stiffeners and connections as per IS:800-2007.
ELE. I (CM) Lab	301010C	C310.1	Illustrate construction scheduling, work study and work measurement

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ELE. I (CM) Lab	301010C	C310.2	Acquaint financial aspects of construction projects
		C310.3	Explain elements of risk management
		C310.4	State material management techniques in construction
		C310.5	Understand basics of artificial intelligence techniques in civil
		C310.6	Develop technical writing and presentation skills
Audit Course I: Professional Ethics and Etiquettes	301011 a	C311.1	Understand the basic perception of profession, professional ethics, various moral issues and uses of ethical theories
		C311.2	Understand various social issues, industrial standards, code o ethics and role of professional ethics in engineering field.
		C311.3	Follow ethics as an engineering professional and adopt good standards and norms of engineering practice.
		C311.4	Apply ethical principles to resolve situations that arise in their professional lives
Waste Water Engineering	301012	C312.1	Recall sanitation infrastructure, quantification and characterization of wastewater, natural purification of streams
		C312.2	Design preliminary and primary unit operations in waste water treatment plant
		C312.3	Understand theory and mechanism of aerobic biological treatment system and to design activated sludge process
		C312.4	Understand and design suspended and attached growth wastewater treatment systems
		C312.5	Explain and apply concept of contaminant removal by anaerobic, tertiary and emerging wastewater treatment systems
		C312.6	Compare various sludge management systems and explain the potential of recycle and reuse of wastewater treatment
Design of Reinforced Concrete Structures	301013	C313.1	Apply relevant IS provisions to ensure safety and serviceability of structures, understand the design philosophies and behavior of materials: steel & concrete.
		C313.2	Recognize mode of failure as per LSM and evaluate moment of resistance for singly, doubly rectangular, and flanged sections.
		C313.3	Design & detailing of rectangular one way and two-way slab with different boundary conditions
		C313.4	Design & detailing of dog legged and open well staircase
		C313.5	Design & detailing of singly/doubly rectangular/flanged beams for flexure, shear, bond and torsion.
		C313.6	Design & detailing of short columns subjected to axial load, uni-axial/bi-axial bending and their footings.

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Remote Sensing and Geographic Information System	301014	C314.1	Articulate fundamentals and principles of RS techniques.
		C314.2	Demonstrate the knowledge of remote sensing and sensor characteristics.
		C314.3	Distinguish working of various spaces-based positioning systems.
		C314.4	Analyze the RS data and image processing to utilize in civil
		C314.5	Explain fundamentals and applications of RS and GIS
		C314.6	Acquire skills of data processing and its applications using GIS
Internship	301016	C316.1	To develop professional competence through industry internship
		C316.2	To apply academic knowledge in a personal and professional environment
		C316.3	To build the professional network and expose students to future employees
		C316.4	Apply professional and societal ethics in their day to day life
		C316.5	To become a responsible professional having social, economic and administrative considerations
		C316.6	To make own career goals and personal aspirations
Waste Water Engineering (Lab)	301017	C317.1	Characterize the wastewater for physical, chemical and microbiological treatment
		C317.2	Test the waste water sample for various fundamental pollutants
		C317.3	Design the different components of waste water treatment plant.
Design of Reinforced Concrete Structures (Lab)	301018	C318.1	Design G + 2 (residential/commercial/public) building covering all types of slabs, beams, columns, footings and staircase (first and intermediate flight).
		C318.2	Draw RCC detailing of slabs, beams, columns footings and Staircase
		C318.3	Design any one element of G + 2 (residential/commercial/public) building by using spread sheet or use of analysis and design by suitable software.
RS GIS (Lab)	301019	C319.1	Analyze the RS data and image processing to utilize in civil
		C319.2	Generation of thematic maps using Softawres
		C319.3	Interpret aerial photographs.
		C319.4	Acquire skills of data processing and its applications using GIS
		C319.5	Analysis of exporting data from GIS to other softwares