



WALCHNAD INSTITUTE OF TECHNOLOGY, SOLAPUR

DEPARTMENT OF CIVIL ENGINEERING

Program Educational Objectives (PEOs): B. Tech. Civil Engineering

Department Vision

The department of Civil Engineering will excel and lead in education, research and innovation; contributing to the advancement of design, construction and maintenance of infrastructure to enhance the quality of life for humanity in a sustainable way.

Department Mission

1. To provide an outstanding learning experience through a rigorous curriculum of theory and practice that develops students' technical and professional skills to succeed in a wide range of careers.
2. To continually advance research through a culture of discovery, creativity and innovation to benefit humankind.
3. To serve as highly capable resources to society, the profession through professional organizations, consultancy and continuing education.

Program Educational Objectives (PEOs):

The Program Educational Objectives for B. Tech. Civil Engineering program are designed to produce competent civil engineers who are ready to contribute effectively to the advancement of Civil Engineering and to fulfill the needs of the community. These objectives are as follows:

1. Graduate will demonstrate peer-recognized technical competency in the analysis, design and construction of Civil Engineering Structures.
2. Graduate will demonstrate leadership and initiative to advance professional and organizational goals with a commitment to ethical standards of profession, teamwork and respect for diverse cultural backgrounds.
3. Graduate will be engaged in ongoing learning and professional development through pursuance of higher education and self-study.
4. Graduates will be committed to create practice of engineering and other professions in a responsible manner contributing to the socio-economic development of the society.

Program Outcomes (POs)

B. Tech. Civil Engineering

The program outcomes of B. Tech. Civil Engineering Program are summarized as following:

- 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 lifelong learning in the broadest context of technological change.



PROGRAM SPECIFIC OUTCOMES (PSOs)

B. Tech. Civil Engineering

1. Students will be able to survey, conduct geo-technical investigations, plan, analyze, design, estimate and construct residences, public buildings, industrial buildings, townships, and infrastructural projects by adopting appropriate construction methods.
2. Students will be able to analyze and design the water resources systems, municipal and industrial waste treatment plants with due consideration to pollution free environment.
3. Students will be able to use appropriate application software, develop skills necessary for professional practice as a Civil Engineer and prepare themselves for competitive examinations for higher education & for public service commissions.

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Department of Civil Engineering -SY Civil-2020-21-Part-I
COURSE OUTCOMES



CV211 Concrete Technology, Material Testing and Evaluation

At the end of this course, students will be able to,

CO No	Course Outcomes
C211.1	Carry out testing of various ingredients of concrete for mix design of concrete
C211.2	Select appropriate type of concrete, admixture and chemicals for specific requirements.
C211.3	Design a concrete mix of required strength and durability, for given field conditions, using suitable ingredients
C211.4	To evaluate properties of construction materials viz. steel, bricks, timber, tiles etc. in laboratory for the quality assurance
C211.5	Design a process that meets desired specifications within realistic constraints.

CV212- Surveying and Geomatics

At the end of this course, students will be able to,

CO No	Course Outcomes
C212.1	Carry out temporary adjustments of modern surveying equipment's
C212.2	Use the surveying instruments namely levels, theodolite, EDM, total station for surveying measurements such as horizontal/ vertical/inclined distance, horizontal/ vertical angles, bearings, reduced levels, and coordinates.
C212.3	Develop plans, draw maps and draft reports for surveying projects of Civil Engineering works.
C212.4	Use the modern surveying techniques namely remote sensing, Global positioning system and Geographic information system for Civil Engineering applications.
C212.5	Demonstrate the attributes of leadership, working in the team and professional ethics while performing the surveying projects.

CV213. Building Construction and Drawing

At the end of this course, students will be able to,

CO No	Course Outcomes
C213.1	Elucidate functional requirements of buildings and types of foundation and its suitability.
C213.2	Draw neat drawings of different building components such as doors, windows, stairs etc. with the suitable scale using CADD software.
C213.3	Design different types of staircases commonly used in residential and public buildings.
C213.4	Draw neat perspective view drawings of an object and given small residential building.
C213.5	Select appropriate ventilation systems and building finishes.

CV214. Introduction To Fluid Mechanics

At the end of this course, students will be able to,

CO No	Course Outcomes
C214.1	Comprehend technical properties of fluids, their estimations and analysis for civil engineering applications
C214.2	Apply kinematics and dynamics of flow for solving Civil engineering problems
C214.3	Quantify water flow through orifice, mouth piece and estimate losses
C214.4	Select and apply knowledge for conveyance of water through close conduits channels
C214.5	Analyze fluid flows and design pipe networks

CV215 Engineering Geology

At the end of this course, students will be able to,

CO No	Course Outcomes
C215.1	To describe issues concerning the geological formations and geological structure of a region
C215.2	To distinguish the characteristics of the most important geological formations and problems that may arise in the various civil engineering projects in such formations.
C215.3	To interpret and explain the geological structures in the geological maps and cross sections.
C215.4	To assess and appropriately adjust the results of geological study in order to ascertain secure construction and operation of a civil engineering projects like dams, reservoirs hilly roads and railway tracks.
C215.5	To receive, analyze and evaluate data and appropriately and solve technical as well as ground water related problems.

CV216. Introduction to Solid Mechanics

At the end of this course, students will be able to,

CO No	Course Outcomes
C216.1	Employ the knowledge of structural mechanics to depict the behavior of structures.
C216.2	Identify principal planes and find principal stresses.
C216.3	Draw Shear force diagrams and bending moment diagrams of statically determinate beams.
C216.4	Evaluate bending and shear stresses in beams.
C216.5	Analyse the behavior of structure under moving load using Influence line diagrams

CV217. Energy Science & Engineering

At the end of this course, students will be able to,

CO No	Course Outcomes
C217.1	List and explain the main sources of energy and their primary applications nationally and internationally
C217.2	Understand effect of using different energy sources on the environment and climate
C217.3	Describe the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the impact on the environment.
C217.4	List and describe the primary renewable energy resources and technologies.
C217.5	Understand the Engineering involved in projects utilizing these energy sources

CV218. Lab Practice

At the end of this course, students will be able to,

CO No	Course Outcomes
C218.1	Architectural floor plan of a small residential building
C218.2	The geometric constructions, multi-view, sectional view, dimensioning and detail drawings of typical 2-D engineered objects.
C218.3	Views like elevation, section, furniture plan for a small residential building
C218.4	Detailed formatted and dimensioned Civil Engineering drawings.
C218.5	Printing the AutoCAD output

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COURSE OUTCOMES

CV221 WATER SUPPLY ENGINEERING

At the end of this course, students will be able to,

CO No	Course Outcomes
C221.1	Plan and design water conveyance systems for a rural/urban area based on population forecasts.
C221.2	Design various water treatment units and plan their operations on the basis of raw water quality and water demand.
C221.3	Apply knowledge of advanced water treatment processes for individual water purification units.
C221.4	Plan and design water distribution systems
C221.5	Identify operation and maintenance problems in water supply systems and suggest suitable solutions.

CV222. Building Planning and Design

At the end of this course, students will be able to,

CO No	Course Outcomes
C222.1	Plan residential and public buildings, according to the prevalent building byelaws
C222.2	Prepare 'Municipal building permission drawings' of a residential buildings using CADD software tools.
C222.3	Plan appropriate building services for a building
C222.4	Design a rain water harvesting system for a building.
C222.5	Plan appropriate acoustics, sound insulation and firefighting arrangements for a building

CV223 Hydraulic Engineering

At the end of this course, students will be able to,

CO No	Course Outcomes
C223.1	Apply their knowledge of fluid mechanics in addressing problems in open channels.
C223.2	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.
C223.3	Carry out hydraulic design of notched, weirs and spillways
C223.4	Explain the working of Pelton, Francis and Kaplan turbines and pumps along their performance parameters.
C223.5	Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics

C224 ICT for Development (Open Elective-I)

At the end of this course, students will be able to,

CO No	Course Outcomes
C224.1	Use Learning Management system like MOODLE
C224.2	Prepare documents and Presentations using information processing tools.
C224.3	Use spreadsheets & databases for problem solving in civil engineering
C224.4	Prepare reports using LaTeX.
C224.5	Create basic website using Wordpress.
C224.6	Get acquainted with Netiquettes and plagiarism.

CV225. Structural Analysis

At the end of this course, students will be able to,

CO No	Course Outcomes
C225.1	Employ the knowledge of structural mechanics to describe the behavior of structures.
C225.2	Analyze determinate and indeterminate structural members subjected to different types of loadings.
C225.3	Discretize simple structures; identify static and kinematic degrees of freedom
C225.4	Analyze beams, trusses and frames for joint displacements, and forces in members, by force method and displacement method.
C225.5	Select and use appropriate application software for structural analysis.

CV226. Engineering Mathematics-III

At the end of this course, students will be able to,

CO No	Course Outcomes
C226.1	Solve higher order linear differential equation with constant coefficient
C226.2	Solve partial differential equation of first order
C226.3	Express a function in terms of sine and cosine components so as to model simple periodic functions.
C226.4	Apply Laplace and inverse Laplace transforms for solving linear differential equations.
C226.5	Find the relation between two variables for the given data using regression
C226.6	Sketch and explain various probability distribution functions

CV227. Computer Programming and Numerical Methods

At the end of this course, students will be able to,

CO No	Course Outcomes
C227.1	Write computer programs for Civil Engineering Problems
C227.2	Write computer programs Matrix operations, which are necessary for structural analysis.
C227.3	Develop computer programs for calculating Roots of equation, Numerical Integration, ordinary differential equations and their various applications in Civil Engineering.
C227.4	Write computer programs for carrying out statistical analysis of data for various statistical methods, with applications from Civil Engineering domain.
C227.5	Perform Numerical integration

CV228. Environmental Studies

At the end of this course, students will be able to,

CO No	Course Outcomes
C228.1	To recognize the natural environment and its relationships with human activities
C228.2	Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems
C228.3	Characterize and analyze human impacts on the environment
C228.4	Design and evaluate strategies, technologies, and methods for sustainable management of environmental systems
C228.5	Analyze the social, economic, and political and policy dynamics involved in both the emergence and the resolution of environmental problems
C228.6	Evaluate critical analytical skills concerning to energy portfolio and other.

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COURSE OUTCOMES



CV-311 Design of Steel Structures

At the end of this course, students will be able to,

CO No	Course Outcomes
C311.1	Select appropriate load combinations for 'Limit State' design of various elements of steel structures for strength and serviceability
C311.2	Analyze and design Tension members, Compression members, flexural members and their connections.
C311.3	Analyze beams and portal frames by plastic analysis approach
C311.4	Analyze and design a Roof truss for given loading conditions.
C311.5	Design Column, Column base for given loading conditions.

CV-312 Geotechnical Engineering

At the end of this course, students will be able to

CO No	Course Outcomes
C312.1	Determine various index properties and strength properties of soil in the laboratory to characterize and classify the soil.
C312.2	Estimate the permeability and seepage through soil mass by applying basic hydraulic flow principles.
C312.3	Draw stress contours in soil mass by applying stress distribution theory.
C312.4	Determine shear strength parameters of soil under various drainage conditions
C312.5	Assess compaction and consolidation settlement of soil for given loading conditions.
C312.6	Determine earth pressure for earth retaining structure.

CV-313 Waste Water Engineering & Air Pollution

At the end of this course, students will be able to

CO No	Course Outcomes
C313.1	Plan the layout of sewage collection system, matching with topography of the region and characterization of sewage
C313.2	Select aerobic or anaerobic wastewater treatment processes and decide their sequence.
C313.3	Design of aerobic and anaerobic wastewater treatment units and disposal of treated wastewater into the streams.
C313.4	Elaborate the novel decentralized wastewater treatment systems.
C313.5	Select appropriate methods of Solid waste Disposal and Management of hazardous waste based on their characteristics.
C313.6	Analyze air pollution and adopt various measures to control air pollution.

CV-314 Highway & Tunnel Engineering

At the end of this course, students will be able to

CO No	Course Outcomes
C314.1	Choose the ideal alignment for highways after thorough understanding of planning and different surveys.
C314.2	Design various geometric elements of highway as per IRC standards.
C314.3	Evaluate the pavement materials through various tests in the laboratory and design the crust thickness of pavements as per IRC standards.
C314.4	Describe the different steps in highway construction and select appropriate drainage system.
C314.5	Determine the highway economic cost by different methods of highway projects and explain highway financing.
C314.6	Select appropriate method of tunnel construction in different types of soils.

CV-315 Hydrology and Water Resources Engineering

At the end of this course, students will be able to

CO No	Course Outcomes
C315.1	Estimate runoff, based on rainfall data and watershed characteristics.
C315.2	Estimate design flood for a civil engineering project.
C315.3	Calculate yield of open well and tube well for various types of aquifers using knowledge of ground water hydrology.
C315.4	Elaborate National and State Water Policies.
C315.5	Select appropriate water application technique of irrigation, depending upon type of crop, soil moisture and water availability.
C315.6	Select suitable soil & water conservation techniques for particular watershed

CV-316 -SLH- 31. Self-Learning (H.S.S. Course) Professional Ethics & Human Values

At the end of this course, students will be able to

CO No	Course Outcomes
C316.1	Inculcate the human values in their behavior.
C316.2	Demonstrate the Engineering ethics in their professional practice.
C316.3	Practice the safety and responsibility and professional rights in their professional practice
C316.4	Demonstrate the application of Intellectual Property Rights (IPR)
C316.5	Incorporate the code of ethics of Global organizations such as ASME, ASCE, and IEEE

CV-317- PLANNING & DESIGN OF PUBLIC BUILDING

At the end of this course, students will be able to

CO No	Course Outcomes
C317.1	Plan and design a public building according to requirements adhering to appropriate norms and standards.
C317.2	Prepare “Municipal drawing” for public buildings for obtaining building permission from competent authority.
C317.3	Prepare the building drawings by using suitable ‘Computer Aided Drawing and Design’ application software.
C317.4	Prepare a report on building project under above.

CV-318- Mini Project

At the end of this course, students will be able to

CO No	Course Outcomes
C318.1	Conduct and write the Literature Survey
C318.2	Carry out Theoretical Formulation
C318.3	Synthesize and compose the subject Knowledge
C318.4	Develop working prototypes /simulation models / Conduct extensive parametric research
C318.5	Draft the progress reports and make presentations.

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COURSE OUTCOMES

CV-321- Foundation Engineering



At the end of this course, students will be able to

CO No	Course Outcomes
C321.1	Evaluate bearing capacity of soil by various analytical and experimental approaches by obtaining the data from soil exploration.
C321.2	Perform geotechnical design of shallow foundation such as isolated footing, combined footing, raft foundation.
C321.3	Apply suitable ground improvement techniques for construction of footing in difficult soil.
C321.4	Perform geotechnical design of deep foundation such as Pile foundation and Caisson foundation
C321.5	Investigate slope stability of embankments

CV-322- Hydraulic Structures and Water Power Engineering

At the end of this course, students will be able to

CO No	Course Outcomes
C322.1	Plan and design the reservoirs depending upon the water resources potential.
C322.2	Analyze and design Gravity dams and Earth dams (Simple Designs).
C322.3	Elaborate the design principles of Arch dams.
C322.4	Carry out Hydraulic Design of spillways
C322.5	Select appropriate method of river training depending upon river characteristics
C322.6	Estimate water power potential at a site.

C323- Infrastructural Planning & Management (Professional Elective-I)

At the end of this course, students will be able to

CO No	Course Outcomes
C323.1	Apply Infrastructure Engineering concepts and explain Public Private Partnership in Civil Engineering.
C323.2	Explain policies, economics, operation research, and technologies prevailing in infrastructural engineering and the social aspects of infrastructure development.
C323.3	Apply the advanced infrastructure tools for successful infrastructure Management.
C323.4	Face the challenges in construction and maintenance of infrastructure
C323.5	Apply the principles of infrastructure management systems in civil engineering

CV-323-Open Channel and River Hydraulics (Professional Elective-I)

At the end of this course, students will be able to,

CO No	Course Outcomes
C323.1	Demonstrate basic principles of the open channel flow.
C323.2	Analyse the various types of flows viz. uniform flow, gradually varied flows rapidly varied flow etc.
C323.3	Explain the mechanics of sediment transport
C323.4	Apply the knowledge of open channel hydraulics to river engineering.
C323.5	Apply the knowledge of dimensional analysis to develop different hydraulic models

CV-324. Design of Concrete Structures – I

At the end of this course, students will be able to,

CO No	Course Outcomes
C324.1	Use suitable design philosophy for designing RCC structural elements
C324.2	Design appropriate type of slab for a given loading
C324.3	Analyze and Design suitable type of beam for a given condition
C324.4	Design beam subjected to combined bending, shear and torsion
C324.5	Analyze and design appropriate type of column

CV-325- Principles of Management and Quantitative Techniques

At the end of this course, students will be able to

CO No	Course Outcomes
C325.1	Demonstrate decision making and communication as a member of a team as well as Lead a team for effective management of construction projects.
C325.2	Apply the Optimization techniques for decision making in construction industry.
C325.3	Carry out ABC analysis, break even analysis and calculate EOQ and Inventory costs for construction project.
C325.4	Create and edit master libraries in the ERP system.
C325.5	Use Statistical Methods and Control charts (X, R, p, c charts) for quality control of materials and workmanship in Civil Engineering projects.

CV-326-Rural Roads (Self-Learning Technical Course)

At the end of this course, students will be able to

CO No	Course Outcomes
C326.1	Plan the rural roads and develop rural road network.
C326.2	Design different elements of road geometrics of rural roads.
C326.3	Apply the knowledge of using locally available materials for construction and aim at low-cost rural roads.
C326.4	Design the rural road pavement as per IRC standards.
C326.5	Carry out construction and maintenance of rural roads.

CV- 327 Project on Steel Structures

At the end of this course, students will be able to

CO No	Course Outcomes
C327.1	Design and assemble the various components of Industrial shed with roof truss or portal frame or gable Frame and prepare their detailed computer aided drawing
C327.2	Design the various components of Building frame/Foot bridge/Welded plate girder and prepare their detailed computer aided drawing
C327.3	Analyze the steel structure using standard structural engineering application software
C327.4	Design of Column and column Bases with their Connection
C327.5	Create report for the structure as per Analysis and Design.

CV- 328 Field Training Report

At the end of this course, students will be able to

CO No	Course Outcomes
C329.1	Make technical communication with the Company/ Contact Person about the intent and permission for the field training
C329.2	Collect knowledge about the company and nature of work being conducted
C329.3	Observe the Safety precautions on and off the field
C329.4	Prepare the field notes
C329.5	Draft the field training reports.

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COURSE OUTCOMES



CV-411. Design of Concrete Structures – I

At the end of this course, students will be able to,

CO No	Course Outcomes
C411.1	Use suitable design philosophy for designing RCC structural elements
C411.2	Analyze and Design of different RCC Slab actions by Limit State Method.
C411.3	Analyze and Design of different RCC Beam actions Limit State Method.
C411.4	Analyze and Design of rectangular RCC Beam subjected to combined actions including Torsion by Limit State Method.
C411.5	Analysis and Design of different types of RCC Columns by Limit State Method

CV-412. Quantity Surveying & Valuation

At the end of this course, students will be able to,

CO No	Course Outcomes
C412.1	Write specifications and prepare estimates for various Civil Engineering works.
C412.2	Carry out analysis of rates for various items of works of construction.
C412.3	Carry out valuation of land and buildings.
C412.4	Demonstrate professional ethics in Civil Engineering sector.
C412.5	Detailed estimate of buildings

CV-413. Earthquake Engineering

At the end of this course, students will be able to,

CO No	Course Outcomes
C413.1	Apply the Principles of Earthquake Engineering in planning, design and construction of building.
C413.2	Demonstrate the dynamic analysis of structures under earthquake load.
C413.3	Incorporate Earthquake resistant features for various types of construction.
C413.4	Adopt the provisions of IS 1893-2016 and IS 13920- 2016 Codes.
C413.5	Incorporate Ductility features in the structures.

CV-414. ENGINEERING MANAGEMENT – II

At the end of this course, students will be able to,

CO No	Course Outcomes
C414.1	Plan the project and prepare Bar chart and Network to optimize the project duration and cost
C414.2	Update the network and re-evaluate the resources.
C414.3	Demonstrate the decision-making abilities based on economics in projects and to appraise alternative projects
C414.4	Analyse life cycle cost and value of the project.
C414.5	Use appropriate project management application software for planning, tracking and reporting progress of civil engineering projects

CV-415A ELE- II Open Channel and River Hydraulics

At the end of this course, students will be able to,

CO No	Course Outcomes
C415A.1	Demonstrate basic principles of the open channel flow.
C415A.2	Analyse the various types of flows viz. uniform flow, gradually varied flows rapidly varied flow etc.
C415A.3	Apply the knowledge of open channel hydraulics to river engineering.
C415A.4	Perform model analysis studies.
C415A.5	Develop skill in model analysis spatially in distorted models.

CV-415B ELE- I Air Pollution and Control

At the end of this course, students will be able to,

CO No	Course Outcomes
C415B.1	Identify the sources of air pollutants and their effect on human, plants and materials.
C415B.2	Apply knowledge of meteorology for controlling air pollution
C415B.3	Design air pollution controlling equipment's.
C415B.4	Apply knowledge of legislation for prevention and control of air pollution.
C415B.5	Prevent and control of air pollution based on legislation

CV-415C ELE- I Design of Foundations

At the end of this course, students will be able to,

CO No	Course Outcomes
C415C.1	Apply different soil investigation techniques on field
C415C.2	Evaluate the bearing capacity of soil analytically as well as by field test such as plate load test, Standard Penetration test etc.
C415C.3	Design the different shallow foundation and deep foundation to meet the site requirement and loading conditions
C415C.4	Apply suitable soil improvement techniques such as soil isolation, Geotextiles or using CNS soil for the give field condition.
C415C.5	Design the simple machine foundations using codal provision.

CV- 416 Seminar

At the end of this course, students will be able to,

CO No	Course Outcomes
C416.1	Identify the recent developments and technology transfer taking place in the Civil Engineering domain
C416.2	Conduct literature Survey of the technical Civil Engineering subject of his choice.
C416.3	Prepare Theoretical Formulation on the subject of his/her interest
C416.4	Prepare and deliver the presentation on the subject chosen using recent presentation tools
C416.5	Enhance the soft skill and presentation skill.

CV-417. Project work

At the end of this course, students will be able to,

CO No	Course Outcomes
C417.1	Develop an ability to apply the basic knowledge of mathematics, science and engineering to real-life problems.
C417.2	Identify the real-life problem and present the solution by conducting experimental/ analytical study and in and off the laboratory.
C417.3	Apply modern tools such as different application software, modern instrumentation for the most precise study of the project undertaken
C417.4	Demonstrate a commitment to teamwork while working with other students of diverse culture and different intellectual backgrounds.
C417.5	Draft progress reports and make presentations.

CV-418. Field Training-II

At the end of this course, students will be able to,

CO No	Course Outcomes
C418.1	Make technical communication with the Company/ Contact Person about the intent and permission for the field training
C418.2	Collect knowledge about the company and nature of work being conducted
C418.3	Observe the Safety precautions on and off the field
C418.4	Prepare the field notes
C418.5	Draft the field training reports.

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COURSE OUTCOMES



CV-421. Design of Concrete Structures- II

At the end of this course, students will be able to,

CO No	Course Outcomes
C421.1	Analyse and Design RCC Stairs and Column Footings.
C421.2	Analyse and Design of RCC Retaining walls and Water tanks.
C421.3	Analyse Pre-stress concrete sections.
C421.4	Determine Loss of Pre-stress and Design of Pre-stress Beams.
C421.5	Analyse and Design the End Block of post tensioned PSC girder.

CV-422-Construction Practices and Town Planning

At the end of this course, students will be able to,

CO No	Course Outcomes
C422.1	Prepare layout of small towns
C422.2	Identify and select various inputs for town planning
C422.3	Calculate output of construction machines
C422.4	Execute various items of construction work using construction machinery and adopt appropriate safety measures.
C422.5	Explain the Prefabricated construction

CV-423-Transportation Engineering-II

At the end of this course, students will be able to,

CO No	Course Outcomes
C423.1	Perform geometric design for the Railway tracks.
C423.2	Learn different types of structural components, engineering properties of the materials, to calculate the material quantities required for construction.
C423.3	Design simple turnout at points and crossings and describe the working principles of railway interlocking system.
C423.4	Design and plan airport layout, design facilities required for runway, taxiway and impart knowledge about visual aids.
C423.5	Identify components of Docks and Harbour and their working principles

CV-423A- Solid and Hazardous Waste Management (Elev-III)

At the end of this course, students will be able to,

CO No	Course Outcomes
C423A.1	Suggest waste reduction and resource recovery methods
C423A.2	Explain various waste disposal methods
C423A.3	Examine legal, political and administrative considerations in design and operation of solid and hazardous waste management
C423A.4	Estimate of damages, risk assessment and management.
C423A.5	Explain methods of storage and handling of hazardous waste

CV-424B- DESIGN OF BRIDGES (Elective-III)

At the end of this course, students will be able to,

CO No	Course Outcomes
C424B.1	Evaluate different loads coming on the bridges as per the IRC bridge code
C424B.2	Design the different types of Deck slabs such as Solid slab and T beam type slab for two lane and four lane bridges.
C424B.3	Verify the adequacy of the Pier and Abutments for the given data
C424B.4	Design of different types of bearings
C424B.5	Identify the most suitable techniques for the maintenance and repair of the bridge under the given conditions

CV-424 Project on RCC Structures

At the end of this course, students will be able to,

CO No	Course Outcomes
C425.1	Apply codal provisions in the analysis and design of structures in accordance with relevant IS codes.
C425.2	Prepare detailed drawing of R.C.C section of designed building.
C425.3	Detailed design & drawing of the following R.C. structures
C425.4	Perform the analysis using relevant application software.

CV-426 Project Work

At the end of this course, students will be able to,

CO No	Course Outcomes
C426.1	Develop an ability to apply the basic knowledge of mathematics, science and engineering to real-life problems.
C426.2	Identify the real-life problem and present the solution by conducting experimental/ analytical study and in and off the laboratory.
C426.3	Apply modern tools such as different application software, modern instrumentation for the most precise study of the project undertaken
C426.4	Demonstrate a commitment to teamwork while working with other students of diverse culture and different intellectual backgrounds.
C426.5	Draft progress reports and make presentations.