**DEPARTMENT OF CIVIL ENGINEEERING (2024-25)**

| Semester | Subject Code | Name of Course | CO No. | Course Outcome |
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| III | BTBS301 | Mathematics – III | 1 | Students will be able to identify the transforms of special functions such as periodic functions, Heaviside-unit step function, and Dirac delta function. |
| | | | 2 | Students will be able to apply Laplace & Inverse Laplace transform methods to solve linear differential equations and systems with constant coefficients. |
| | | | 3 | Students will be able to apply Fourier transforms and integral properties, including sine and cosine integrals and Parseval's identity, to transform functions. |
| | | | 4 | Students will be able to apply techniques to form and solve partial differential equations, including linear equations and separation of variables for heat flow analysis. |
| | | | 5 | Students will be able to describe how harmonic functions in Cartesian form are derived and their relationship with analytic functions. |
| | | | 6 | Students will be able to solve the complex function with reference to their analyticity, integration using Cauchy‘s integral and residue theorems |
| III | BTCVES302 | Mechanics of Solids | 1 | Students will be able to **determine** stresses, strains and deformation of body under various types of loading. |
| | | | 2 | Students will be able to **calculate** shear forces and bending moments at different points for the beams loaded with various types of loading. |
| | | | 3 | Students will be able to **calculate** bending stresses in beams, shear stresses for various types of cross sections and deformation due to torsion. |
| | | | 4 | Students will be able to **calculate** load carrying capacity of long and short columns |
| | | | 5 | Students will be able to **analyze** effect of combined stresses at a point by analytical and graphical method and discuss failure theories. |
| III | BTCVC303 | Building Construction & Drawing | 1 | Students can **differentiate** the different types of masonry structures. |
| | | | 2 | Students can **identify** different ingredients and properties of concrete |
| | | | 3 | Students will be able to **explain** the types of arches and lintels |
| | | | 4 | Students will be able to **describe** the means of lateral communication |
| | | | 5 | Students will be able to **identify** the different flooring and roof coverings |
| | | | 1 | Students will be able to analyze fluid properties. |
| | | | 2 | Students will be able to analyze the principles of flow measurement. |

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| III | BTCVC304 | Hydraulics -I | 3 | Students will be able to demonstrate understanding of boundary layer concepts and their significance in fluid dynamics. |
| | | | 4 | Students will be able to apply dimensional analysis techniques to conduct model studies for practical applications. |
| | | | 5 | Students will be able to calculate energy losses in pipes |
| III | BTCVC305 | Surveying | 1 | Students will be able to examine Measurements in Linear/Angular Methods. |
| | | | 2 | Students will be able to interpret Bearings |
| | | | 3 | Students will be able to interpret Plane Table Surveying in General Terrain. |
| | | | 4 | Students will be able to state The Basics of Leveling Survey in Elevation |
| | | | 5 | Students will be able to know The Basics of Theodolite and Survey in Elevation and Angular Measurements. |
| | | | 6 | Students will be able to describe Layout of Structure |
| III | BTHM306 | Soft Skill Development | 1 | Students will be able to adopt interpersonal communication skills |
| | | | 2 | Students will be able to develop the ability to work independently. |
| | | | 3 | Students will be able to develop the qualities like self-discipline, self-criticism and self -management |
| | | | 4 | Students will be able to apply time management and discipline in personal and professional life. |
| | | | 5 | Students will be able to adopt self-motivation and inspire others. |
| III | BTCVL 307 | Solid Mechanics Laboratory | 1 | Students will be able to Observe the behavior of materials by conducting Tension, Compression & Shear tests. |
| | | | 2 | Students will be able to Identify the Impact Strength of Material. |
| | | | 3 | Students will be able to Compute Elastic constants of a given material using flexural and torsion tests. |
| | | | 4 | Students will be able to Calculate stresses on inclined plane using Mohr's Circle |
| III | BTCVL 308 | Hydraulics-I Laboratory | 1 | Students will be able to identify and demonstrate the operation of various types of valves and pipe fittings used in fluid systems. |
| | | | 2 | Students will be able to measure pressure using different instruments, including piezometers, manometers, and pressure gauges, and interpret the readings. |
| | | | 3 | Students will be able to measure discharge by calibrating a measuring tank ensuring accuracy in fluid measurement. |

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| | | | 4 | Students will be able to determine the loss of head in pipelines due to pipe fittings and evaluate the impact on overall flow efficiency. |
| | | | 5 | Students will be able to determine the metacentric height of floating bodies to assess stability in practical applications. |
| III | BTCVL 309 | Surveying Laboratory | 1 | Students will apply and analyze the use of theodolite, chain/tape, and compass in field measurements, and evaluate the results to improve surveying techniques. |
| | | | 2 | Students will apply geometric and trigonometric principles to calculate angles, distances, and elevations using instruments like the theodolite and chain/tape |
| | | | 3 | Students will plan a survey by taking accurate measurements, recording data in field books, and applying methods to adjust for errors |
| | | | 4 | Students will apply field procedures in various types of surveys while collaborating as part of a surveying team |
| | | | 5 | Students will employ drawing techniques to develop a topographic map |
| III | BTES210P | Internship –I Evaluation | 1 | Students will be able to recall and describe basic field practices and industry standards in civil engineering. |
| | | | 2 | Students will be able to understand and explain the application of civil engineering concepts in real-world scenarios. |
| | | | 3 | tudents will be able to apply basic tools and techniques in fieldwork to solve practical problems. |
| | | | 4 | Students will be able to analyze project progress and identify issues in construction or site management. |
| | | | 5 | Students will be able to synthesize findings from the field experience and present technical information clearly and effectively. |
| IV | BTCVC401 | Building Planning and Drawing | 1 | Students will be able to **prepare** plan of buildings considering various principles of planning |
| | | | 2 | Students will be able to **prepare** plan of buildings considering various building bye laws of governing body. |
| | | | 3 | Students will be able to **explain** various plumbing systems, electrification and fire resistance in building |
| | | | 4 | Students will be able to **classify** different ventilation system as per selection criteria |
| | | | 5 | Students will be able to **select** various materials for good acoustics and for green building construction |
| IV | BTCVC402 | Environmental Engineering | 1 | Students will be able to recall and describe the components of the environment, water demand factors, and potable water quality standards. |
| | | | 2 | Students will be able to explain the principles and processes involved in water treatment, including aeration, sedimentation, and disinfection. |

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| | | | 3 | Students will be able to utilize hydraulic principles to design and assess various water distribution systems. |
| | | | 4 | Students will be able to describe the treatment processes for wastewater and solid waste, emphasizing preliminary to advanced techniques. |
| | | | 5 | Students will be able to identify the sources and effects of air pollution and summarize key control measures. |
| IV | BTCVC403 | Structural Mechanics - I | 1 | Students will be able to calculate slope and deflection in determinate beam |
| | | | 2 | Students will be able to execute application of strain energy theorem for computing deflection in beams |
| | | | 3 | Students will be able to analyze fixed end moments in indeterminate beams |
| | | | 4 | Students will be able to analyze continuous beam by moment distribution method |
| | | | 5 | Students will be able to analyze continuous beam, rigid frames and frames with or without beams by slope deflection method |
| IV | BTCVC404 | Water Resources Engineering | 1 | Students will be able to analyze the scope, necessity, and advantages of irrigation, classify different irrigation systems. |
| | | | 2 | Students will be able to apply principles of reservoir planning and management strategies. |
| | | | 3 | Students will be able to able to differentiate between various dam types, analyze their design criteria and stability considerations. |
| | | | 4 | Students will be able to able to apply theories of seepage and erosion to design weirs and canals |
| | | | 5 | Students will be able to analyze hydrological processes, such as rainfall, runoff, and infiltration |
| IV | BTCVC405 | Hydraulics - II | 1 | Students will be able to describe open channel sections in a most economical way |
| | | | 2 | Students will be able to explain the non-uniform flows in open channel. |
| | | | 3 | Students will be able to apply the momentum principle to the impact of jets on a plane and the characteristics of a hydraulic jump. |
| | | | 4 | Students will be able to explain the working principle of turbines. |
| | | | 5 | Students will be able to summarize the construction and working of pumps. |
| IV | BTCVC406 | Engineering Geology | 1 | Students will be able to recognize the different land forms which are formed by various geological agents |
| | | | 2 | Students will be able to identify the origin, texture and structure of various rocks and physical properties of mineral. |

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| | | | 3 | Students will be able to indicate distinct geological structures which have influence on the civil engineering structure. |
| | | | 4 | Students will be able to explain how the various geological conditions affect the design parameters of structures. |
| | | | 5 | Students will be able to describe site improvement techniques |
| IV | BTCVL407 | Building Planning and CAD Lab | 1 | Students will be able to Draw plan, elevation and section of load bearing and framed structures |
| | | | 2 | Students will be able to Draw plan, elevation and section of public structures. |
| IV | BTCVL408 | Environmental Engg. Lab | 1 | Quantify key pollutants in water and wastewater, including parameters such as pH, turbidity, hardness, and chlorides. |
| | | | 2 | Interpret pollutant concentrations and recommend the necessary degree of treatment based on environmental standards. |
| | | | 3 | Examine the conditions that affect microorganism survival and growth rates, relating these to wastewater treatment processes |
| | | | 4 | Evaluate the effectiveness of treatment processes by comparing experimental results with established environmental standards. |
| | | | 5 | Develop a comprehensive report that synthesizes findings from laboratory experiments and the water treatment plant site visit, demonstrating an understanding of real-world applications. |
| IV | BTCVL409 | HE-II Lab. | 1 | Understand various properties of fluids and measurement techniques |
| | | | 2 | Apply the principles of fluid mechanics to calibrate flow measurement devices for assessment of discharge. |
| | | | 3 | Analyze the phenomenon of hydraulic jump |
| | | | 4 | Investigate the principles of jet impact and study turbine operations |
| | | | 5 | Perform tests on centrifugal pumps, analyze performance characteristics, |
| IV | BTCVP410 | Field Training / Internship/Industrial Training | 1 | Students will learn the industrial culture at the basic level like corporate communications, type, methods, effective way of communication. |
| | | | 2 | Students will understand the time discipline for professional workplace |
| | | | 3 | Students will learn the technology using in the industrial process/ manufacturing |
| | | | 4 | Student will handle minor work given by the supervisor from industry. |
| V | BTCVC501 | Design of Steel Structures | 1 | Students will be able to **calculate** strength of connections of steel members. |
| | | | 2 | Students will be able to **design** axially loaded members and flexural members |

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| | | | 3 | Students will be able to **design** Gantry girders and roof trusses of industrial buildings |
| | | | 4 | Students will be able to **design** steel columns and column bases |
| | | | 5 | Students will be able to **explain** limit state design approach as per IS 800: 2007 |
| V | BTCVC502 | Geotechnical Engineering | 1 | Students will be able to classify different soil properties and behavior |
| | | | 2 | Students will be able to calculate stresses in soil and permeability and seepage aspects |
| | | | 3 | Students will be able to categorize soil for design of various foundations |
| | | | 4 | Students will be able to calculate degree of consolidation. |
| | | | 5 | Students will be able to estimate shear strength and compressibility parameters to design different structures |
| V | BTCVC503 | Structural Mechanics –II | 1 | Students will be able to **calculate** the forces in all members of truss and horizontal & vertical displacement at joint of determinate and indeterminate truss and also analyze different moving loads with the help of Influence line diagram |
| | | | 2 | Students will be able to analyse the different types of suspension bridges (i.e., bridges with three hinged and two hinged stiffening girders) and arches (i.e., circular, parabolic and geometric arches) |
| | | | 3 | Students will be able to analyse the indeterminate structures by direct flexibility method |
| | | | 4 | Students will be able to analyse the indeterminate structures by direct stiffness method |
| | | | 5 | Students will be able to analyse the indeterminate structures by Finite Element Method |
| V | BTCVC504 | Concrete Technology | 1 | Students shall be able to interpret the various types and properties of ingredients of concrete. |
| | | | 2 | Students shall be able to demonstrate the different tests carried on materials of concrete. |
| | | | 3 | Students shall be able to explain the effect of admixtures on the behavior of the fresh and hardened concrete. |
| | | | 4 | Students shall be able to show different tests on fresh and harden concrete. |
| | | | 5 | Students shall be able to formulate concrete mix design for various grades of concrete. |
| V | BTHM505 | Project Management | 1 | Students will be able to explain various steps in project Management, different types of charts. |
| | | | 2 | Students will be able to construct network by using CPM and PERT method. |
| | | | 3 | Students will be able to calculate the optimum duration of project with the help of various time estimates. |
| | | | 4 | Students will be able to tell the concept of engineering economics, economic comparisons, and linear break even analysis problems. |
| | | | 5 | Students will be able to describe the concept of total quality Management including Juran and Deming's philosophy. |

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| V | BTCVPE506 | Material, Testing and Evaluation | 1 | Students will be able to describe the basic properties and significance of various materials used in civil engineering. |
| | | | 2 | Students will be able to examine the characteristics and practical applications of materials like cement, steel, and composites in construction. |
| | | | 3 | Students will be able to differentiate the strengths and environmental impacts of various composite materials used in civil engineering. |
| | | | 4 | Students will be able to assess the effectiveness of innovative construction materials and techniques in enhancing building performance. |
| | | | 5 | Students will be able to use appropriate testing methods and machinery to determine the properties of construction materials. |
| V | BTCVES507 | Software applications in Civil Engineering | 1 | Students will be able to discuss & distinguish civil engineering softwares |
| | | | 2 | Students will be able to use applications of various softwares in specialized works of civil engineering |
| | | | 3 | Students will be able to design of various component of building. |
| | | | 4 | Students will be able to use the existing software for civil engineering. |
| | | | 5 | Students shall be able to develope the concrete mix design in MS excel |
| V | BTCVL508 | SDD of Steel Structures Lab. | 1 | Students will be able to design and draw STRUCTURAL detailing of Industrial shed |
| | | | 2 | Students will be able to design and draw STRUCTURAL detailing of Plate Girder |
| V | BTCVL509 | Geotechnical Engineering Lab. | 1 | Student will be able to examine the grain size distribution of soil. |
| | | | 2 | Student will be able to demonstrate the experiment of the specific gravity. |
| | | | 3 | Student will be able to calculate Atterberg limits of soil. |
| | | | 4 | Students will be able to estimate the field density of soil by core cutter and sand replacement methods. |
| | | | 5 | Students will be able to evaluate compaction and shear strength parameters of soil |
| V | BTCVL510 | Concrete Technology Lab. | 1 | Determine different engineering properties of aggregates. |
| | | | 2 | Understand the various types and properties of ingredients of concrete. |
| | | | 3 | Formulate concrete design mix for various grades of concrete. |
| | | | 4 | Understand the behavior of harden concrete for different types of loadings. |
| VI | BTCVC601 | Design of RC Structures | 1 | Explain the basic concepts of structural design and compare different design philosophies. |
| | | | 2 | Analyze and design basic reinforced concrete members using the Working Stress Method. |
| | | | 3 | Apply the concepts of Limit State Method to assess safety and serviceability of RC members. |

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| | | | 4 | Analyze and design flexural members (beams, slabs, staircases) using the Limit State of Collapse. |
| | | | 5 | Analyze and design compression members and footings considering axial and eccentric loading. |
| VI | BTCVC602 | Foundation Engineering | 1 | Students will be able to predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries. |
| | | | 2 | Students will be able to explain the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability. |
| | | | 3 | Students will be able to interpret the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters. |
| | | | 4 | Students will be able to apply geotechnical engineering theories to foundation design. |
| | | | 5 | Students will be able to analyze the stability of slopes by theoretical and graphical methods. |
| VI | BTCVC603 | Transportation Engineering | 1 | Student will able to explain the history of transportation and pavement design. |
| | | | 2 | Students shall be able to differentiate various types of transportation systems and their history of the development. |
| | | | 3 | Students shall be able to interpret to various types of pavements. |
| | | | 4 | Student will able to design the pavements by considering various aspects associated with traffic safety measures. |
| | | | 5 | Student will able to analyze geometric design of pavement |
| VI | BTCVPE604 | Water Power Engineering | 1 | Students will be able to analyze different sources of energy, evaluate various types of power plants. |
| | | | 2 | Students will be able to discuss the different components of a hydro power project. |
| | | | 3 | Students will be able to analyze the general arrangements of power stations |
| | | | 4 | Students will be able to classify turbines based on characteristics in hydro power plants. |
| | | | 5 | Students will be able to analyze the purpose and layout of pumped storage plant and tidal power stations. |
| VI | BTCVOE605 | Applications of Remote Sensing and Geographic Information Systems | 1 | Students will able to memorize demonstrating of earth resources management using remote sensing |
| | | | 2 | Students will able to show skills in storing, managing digital data for planning and development. |
| | | | 3 | Students will able to show skills in advance software's deals with remote sensing data for utilization |
| | | | 4 | Students will able to analyze the basic components of GIS |

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| | | | 5 | Students will able to explain the concept of Map projections and apply the techniques of remote sensing and GIS to required field |
| VI | BTHM606 | Indian Constitution | 1 | Students will able to explain the key aspects of the Indian Constitution. |
| | | | 2 | Students will able to describe the structure and philosophy of the Constitution |
| | | | 3 | Students will able to summarize the power and functions of various constitutional offices and institutions. |
| | | | 4 | Students will able to discuss the significance of the constitution and appreciate the role of constitution and citizen oriented measures in a democracy. |
| | | | 5 | Students will able to analyse the decentralization of powers between central, state and local self government. |
| VI | BTCVL607 | SDD of RC Structures Lab. | 1 | Students will be able to analyse the detail design and drawing of various structural element |
| | | | 2 | Students will be able to design the various structures like G+2 building and retaining wall |
| VI | BTCVL608 | Transportation Engineering Lab | 1 | Comprehend various types of transportation systems and their history of the development. |
| | | | 2 | Comprehend to various types of pavements. |
| | | | 3 | Design the pavements by considering various aspects associated with traffic safety measures. |
| | | | 4 | The students shall be able to learn geometric design of pavement . |
| VI | BTCVM609 | Mini Project | 1 | Students will be able to summarize a technical document by organizing a detailed literature survey. |
| | | | 2 | Students will be able to compare different concepts available in literature about a specific topic |
| | | | 3 | Students will be able to apply theoretical and practical knowledge to solve real field problems through selected project work. |
| | | | 4 | Students will be able to evaluate problem identification, formulation and propose suitable efficient solutions. |
| | | | 5 | Students will be able to develop awareness of current technologies in the field of civil engineering. |
| VI | | Field Training/ Internship/Industrial Training | 1 | Students will learn the industrial culture at the basic level like corporate communications, type, methods, effective way of communication |
| | | | 2 | Students will understand the time discipline for professional workplace. |
| | | | 3 | Students will learn the technology using in the industrial process/ manufacturing. |
| | | | 4 | Student will handle work given by the supervisor from industry and try to give solution using technical knowledge. |

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| | | | 5 | Students will learn to write report, and present his/her work. |
| VII | BTCVC701 | Design of Reinforced & Prestressed Concrete Structures | 1 | Students will be able to **identify, analyse and design** the beam sections subjected to torsion |
| | | | 2 | Students will be able to **analyse and design** the axially and eccentrically loaded column and construct the interaction diagram for them |
| | | | 3 | Students will be able to **explain** various concepts, systems and losses in prestressing |
| | | | 4 | Students will be able to **analyse and design** the rectangular and symmetrical I section prestressed beam/girder |
| | | | 5 | Students will be able to **explain** necessity and procedure to perform an audit of an structure |
| VII | BTCVC702 | Infrastructure Engineering | 1 | Students will be able to explain about the basics and design of various components of railway engineering. |
| | | | 2 | Students will be able to classify the types and functions of tracks, junctions, and railway stations. |
| | | | 3 | Students will be able to classify the types and components of docks and harbors. |
| | | | 4 | Students will be able to illustrate about the aircraft characteristics, planning, and components of an airport. |
| | | | 5 | Students will be able to choose the appropriate tunneling method and lining system. |
| VII | BTCVC703 | Construction Techniques | 1 | Students will explain construction planning, site services, and equipment functions. |
| | | | 2 | Students will explain excavation methods, equipment, and blasting techniques for hard rock. |
| | | | 3 | Students will describe concrete plant operations, mixer types, and placement methods. |
| | | | 4 | Students will summarize prefabricated and steel construction methods and crane types. |
| | | | 5 | Students will apply techniques in road construction, asphalt mixing, and safety measures to real-world scenarios involving diaphragm walls and disaster management |
| VII | BTCVC704 | Professional Practices | 1 | Students will be able to describe the purpose and types of estimates, including the process of quantity surveying and the preparation of detailed specifications. |
| | | | 2 | Students will be able to calculate and analyze rates for civil engineering works, and develop detailed and approximate cost estimates for various projects. |
| | | | 3 | Students will be able to develop and prepare tender documents, including understanding contract conditions and evaluating bids for construction projects. |
| | | | 4 | Students will be able to examine the essential elements of legally binding contracts, and differentiate between various types of contracts used in civil engineering. |

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| | | | 5 | Students will be able to assess the factors affecting property valuation, and apply various methods to determine property value, considering depreciation and obsolescence. |
| VII | BTCVE705D | Rock Mechanics | 1 | Students will be able to explain about rock mechanics and its applications. |
| | | | 2 | Students will be able to able to discover the engineering properties of rocks and sub-surface conditions |
| | | | 3 | Students will be able to identify various causes of slope failure and suggest some preventive measures for them |
| | | | 4 | Students will be able to categorize rock mass into various classes for recognizing overall rock mass quality |
| | | | 5 | Students will be able to modify properties of Rock |
| VII | BTCVOE706B | Air Pollution Control | 1 | Students will be able to identify the structure and composition of the atmosphere, understand their sources and effects on human health |
| | | | 2 | Students will be able to analyze the meteorological factors affecting air pollution. |
| | | | 3 | Students will be able to describe importance of air pollution surveys |
| | | | 4 | Students will be able to analyze the chemistry of air pollution. |
| | | | 5 | Students will be able to propose strategies for air pollution control. |
| | | | 6 | Students will be able to evaluate principles of gaseous pollutant removal systems, analyze vehicular pollution sources. |
| VII | BTHM707A | Essence of Indian Traditional Knowledge | 1 | Students will be able to describe ancient and mediable Indian culture |
| | | | 2 | Students will be able to tell about health and its importance |
| | | | 3 | Students will be able to explain about Indian Architecture & Culture |
| | | | 4 | Students will be able to identify developments in construction materials, living styles and habitation, Town Planning |
| | | | 5 | Students will be able to discuss about Developments in water supply & sanitation, irrigation and agriculture etc. |
| VII | BTCVL708 | Design & Drawing of Prestressed Concrete Structures | 1 | Students will be able to calculates losses in prestress |
| | | | 2 | Students will be able to calculate prestresses on a beam |
| | | | 3 | Students can calculate resistance of PSC members against shear and torsion |
| | | | 4 | Students can draw design detailing of prestressed girder and slab |

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| VII | BTCVL709 | Professional Practices | 1 | Prepare detailed estimates for civil engineering projects, including buildings and various infrastructure elements. |
| | | | 2 | Analyze and interpret cost factors for construction components, conducting rate analysis for selected items. |
| | | | 3 | Develop valuation reports and certificates for civil structures, justifying the assigned value based on industry standards. |
| | | | 4 | Draft precise specifications for civil engineering items across multiple domains, including roads, irrigation, and water supply. |
| | | | 5 | Synthesize findings from estimates, rate analysis, and valuations into detailed professional reports that reflect real-world project requirements. |
| VII | BTCVP610 | Field Training / Internship/Industrial Evaluation | 1 | Students will learn the industrial culture at the basic level like corporate communications, type, methods, effective way of communication. |
| | | | 2 | Students will understand the time discipline for professional workplace. |
| | | | 3 | Students will learn the technology using in the industrial process/ manufacturing. |
| | | | 4 | Student will handle work given by the supervisor from industry and try to give solution using technical knowledge. |
| | | | 5 | Students will learn to write report, and present his/her work. |
| VII | BTCVS710 | Seminar | 1 | Identify a suitable technical topic of his/her area of interest which has a potential to be explored. |
| | | | 2 | Collect literature survey of the selected topic in order to review the current development and identify the future scope. |
| | | | 3 | Elaborate the technical description, regarding the topic by preparing a formal report. |
| | | | 4 | Preparing and delivering effective presentation on the selected topic in order to improve soft skills. |
| VII | BTCVP711 | Project Stage-I | 1 | Students will be able to define the scope, objectives, and key deliverables of their civil engineering project |
| | | | 2 | Students will be able to describe the methodology, including theoretical and practical approaches, relevant to their project objectives. |
| | | | 3 | Students will be able to apply creative ideas and engineering principles to develop a preliminary model or prototype relevant to their project. |
| | | | 4 | Students will be able to analyze the project requirements to refine the methodology and evaluate potential challenges in implementation |
| | | | 5 | Students will be able to evaluate the effectiveness and feasibility of their chosen solutions and design models based on technical, economic, and environmental criteria |

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| | | | 6 | Students will be able to create a comprehensive project report that includes scope, methodology, findings, and recommendations, and deliver a professional presentation to showcase their project outcomes. |
| VIII | BTCVSS801D | Maintenance and Repair of Concrete Structures | 1 | Students will identify the effects of corrosion. |
| | | | 2 | Students will explain the various attacks on concrete. |
| | | | 3 | Students will conclude structural stability through testing and analysis. |
| | | | 4 | Students will relate repair methods to address structural issues. |
| | | | 5 | Students will explain the necessary treatments for concrete. |
| VIII | BTCESS802A | Energy Efficiency Acoustics and Day lighting in Building | 1 | Students will be able to explain the impact of environmental factors on human comfort and how buildings respond to thermal, noise, and visual environments. |
| | | | 2 | Students will be able to compare the processes of heat exchange in buildings, considering the effects of solar radiation and thermal properties of materials. |
| | | | 3 | Students will be able to demonstrate methods like transmission matrices and admittance to compute heat flow in buildings. |
| | | | 4 | Students will be able to explain design strategies for energy efficiency in building structures, including natural ventilation and selection of envelope elements. |
| | | | 5 | Students will be able to summarize acoustic planning and daylighting design principles to optimize indoor environmental quality. |
| VIII | BTCEP803 | Project Stage-II or Internship | 1 | Students will be able to apply engineering knowledge to real-world problems. |
| | | | 2 | tudents will be able to understand industry standards and practices. |
| | | | 3 | Students will be able to analyze project management techniques and team collaboration |
| | | | 4 | Students will be able to evaluate and communicate technical information effectively. |
| | | | 5 | Students will be able to create innovative solutions for complex engineering challenges. |