

**METHODIST COLLEGE OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF CIVIL ENGINEERING**

**Academic Year 2020-21**

**B.E III SEMESTER**

<b>S.no</b>	<b>Course Code</b>	<b>Course Title</b>	<b>CO No.</b>	<b>Course Outcome</b>	<b>Taxonomy level</b>
1	MC204CE	Overview of Civil Engineering	CO1	<b>Illustrate</b> the relevance of civil engineering in the society & describe the uses of various construction materials	Understanding
			CO2	<b>Explain</b> the new technology/concepts of architecture in planning	Understanding
			CO3	<b>What</b> are the basics of surveying, transportation and geotechnical systems.	Remembering
			CO4	<b>What</b> are the basics of environmental, water resources.	Remembering
			CO5	<b>What</b> is Structural engineering systems	Remembering
			CO6	<b>Which</b> are the various software used in the field of civil engineering	Remembering
2	HS203MP	Industrial Psychology	CO1	<b>Apply</b> the Concepts , theory in Industrial perspective	Applying
			CO2	<b>Explain</b> the role played of psychological factors like Motivation , Human needs , Incentives , Job satisfaction , Counselling etc . , and their application in Industry	Understanding
			CO3	<b>Evaluate</b> Consumer behaviour towards production enhancement	Evaluating
			CO4	Evaluate the present work methods and <b>analyze</b> their deficiencies and identify corrective methods	Analyzing
			CO5	<b>Identify</b> the consequences of disturbing work environment due to factors like Noise , Illumination , Atmospheric conditions , work efficiency, fatigue etc. and discuss to mitigate them.	Applying

			<b>CO6</b>	<b>Examine</b> a Holistic and Humane approach and apprise workers in Industry	Analyzing
3	BS206BZ	Biology for Engineers	<b>CO1</b>	<b>Recall</b> the diversity in the living world	Remembering
			<b>CO2</b>	<b>Compare</b> between microorganisms, plants, animals and the human system.	Understanding
			<b>CO3</b>	<b>Choose</b> the organism for its employment in real time design and planning applications.	Evaluating
			<b>CO4</b>	Use of the knowledge of organism their systems and utilize to simulate, <b>design</b> and in planning applications.	Creating
			<b>CO5</b>	Utilise the knowledge to <b>analyze, distinguish</b> and draw <b>inference</b> about the functioning of the living systems.	Analyzing
			<b>CO6</b>	<b>Apply</b> the fundamental knowledge in projects related to human society.	Applying
			4	ES211CE	Engineering Mechanics
<b>CO2</b>	<b>Determine</b> the Centroid and moment of inertia for cross various sections.	Evaluating			
<b>CO3</b>	<b>Analyse</b> the forces in the members of a truss using method of joints and method of sections	Analysing			
<b>CO4</b>	<b>Explain</b> the concept of friction for single and connected bodies.	Understanding			
<b>CO5</b>	<b>Apply</b> the basic concepts of dynamics, their behavior, analysis and motion bodies	Applying			
	<b>Solve</b> problems involving work energy principles and impulse momentum theory.	Applying			
5	ES212ME	Energy Science and	<b>CO1</b>	<b>Explain</b> the basics of various sources of energy.	Understanding
			<b>CO2</b>	<b>Analyse</b> the present status of conventional energy sources	Analysing
			<b>CO3</b>	<b>Illustrate</b> the working principles of Renewable Energy systems	Understanding

5	ES2131ME	Sciences and Engineering	<b>CO4</b>	Analyse and Compare waste heat recovery systems and energy storage	Analysing
			<b>CO5</b>	Relate energy economics, standards and future challenges	Understanding
			<b>CO6</b>	Explain causes of pollution, control methods and relate to pollution	Understanding
6	PC221CE	Solid Mechanics	<b>CO1</b>	Explain the mechanical properties, elastic theories of behavior, stress-strain relationships of solid deformable bodies under various loadings (such as axial, bending, shear, combinations and multi-axial bending).	Understanding
			<b>CO2</b>	Apply the basic concepts of elasticity and static equilibrium to develop (derive) mathematical relations involving loads/stresses and deformations/strains in solid structural members under various load types, within elastic limits of the material	Applying
			<b>CO3</b>	Make use of the mathematically formulated relations based on elastic theories in solid mechanics to solve for the stresses, strains, load bearing capacities and associated quantities in a structural member subjected to various loadings.	Applying
			<b>CO4</b>	Examine the solid material behaviour subject to various load types loads by constructing and analyzing diagrams such as Stress-Strain diagram, Mohr's Circle, Shear Force Diagram, Bending Moment Diagram, Bending stress and shear stress distributions, etc.	Analysing
			<b>CO5</b>	Evaluate two or more geometries and/or material types to choose the more safe and economical design of a structural member for a specific loading type.	Evaluating
			<b>CO6</b>	Design simple structural members to be able to safely resist axial, bending, shear, torsion or combined stresses within the imposed factors of permissible stresses and deformations.	Creating

7	PC222CE	Engineering Geology	CO1	<b>Define</b> the process of weathering, formation of minerals, rocks, soil and concept of geomorphology and how they relate with each other	Remembering
			CO2	<b>Illustrate</b> the features of minerals and rocks, geological structures like faults, folds, joints, In construction field to determine the problems that they may arise because of their presence.	Understanding
			CO3	<b>Demonstrate</b> site investigation techniques and scientific exploration methods in identification of geological structures like Folds, faults and Joints and geological features like ground water, properties and behavior of rocks, soil types.	Understanding
			CO4	<b>Interpret</b> rock properties for their suitability in various construction applications and concepts to apply the knowledge of engineering geology with reference to case studies in civil engineering	Understanding
			CO5	<b>Illustrate</b> the geological problems in dams, reservoirs and tunnels, and explain the geological causes of earthquakes, tsunamis and landslides.	Understanding
			CO6	<b>Explain</b> the geological causes of earthquakes, tsunamis and landslides.	Understanding
			CO2	<b>Demonstrate</b> the working principles and applications of basic and modern surveying instruments like chain, prismatic compass, plane table, dumpy level, theodolite and total station.	Understanding

8	PC223CE	Surveying & Geomatics	CO3	Apply the knowledge of surveying & levelling in calculating lengths, bearings, reduced levels, elevation differences and plotting of a ground	Applying
			CO4	Apply the knowledge of theodolite and trigonometry in finding horizontal and vertical angles, heights of inaccessible points	Applying
			CO5	Make use of knowledge of curves concept in surveying, in setting out both horizontal and vertical curves for the purpose of roadway and railway alignment	Applying
			CO6	Analyse the amount of closing error of a traverse after finding out the omitted measurements in traverse and compute the missing data	Analysing
9	PC251CE	Engineering Geology Lab	CO1	Illustrate maps, types of maps their features	Understanding
			CO2	Interpret the structural geological aspects and problems	Understanding
			CO3	Demonstrate the working process of clinometer compass	Understanding
			CO4	Identify the physical properties of minerals, geological and geotechnical characteristics of rocks.	Applying
			CO5	Make use of Vertical electrical sounding method, stereoscopy & aerial photographs to study landforms, vegetation , water bodies.	Applying
			CO6	Test for the specific gravity, porosity, water absorption of different rocks, and Slake durability to identify the properties of rocks.	Analysing
			CO1	Demonstrate the working principles and handling procedures of basic surveying instruments like chain, prismatic compass, plane table in finding out linear and angular measurements	Understanding
			CO2	Make use of surveying equipments in computing lengths, areas & bearings of given field work	Applying

10	PC252CE	Surveying Lab	CO3	<b>Demonstrate</b> the levelling instruments and apply the knowledge of levelling in finding out the reduced levels of ground	Applying
			CO4	<b>Demonstrate</b> the working principles and handling procedures of theodolite and total station	Understanding
			CO5	<b>Make use of</b> theodolite in finding out horizontal and vertical angles and also in setting out horizontal curves	Applying
			CO6	<b>Apply</b> the knowledge of trigonometrical levelling in finding out reduced levels of elevated objects which are both accessible and inaccessible using theodolite and total station	Applying

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B.E V SEMESTER					
<u>S.no</u>	Course Code	Course Title	CO No.	Course Outcome	Taxonomy level
1	PC322CE	Hydraulic Engineering	CO1	Define various types of flows & to classify the channel bottom slopes and surface profiles of open channel flows.	Remembering
			CO2	Explain the concepts of boundary layer analysis & Dimensional analysis and also to explain the different laws of fluid motion related to open channel and pipe flows.	Understanding
			CO3	Make Use of chezy's and manning's equations while solving various engineering problems in open channel flows.	Applying
			CO4	Analyse the type of flow, type of jumps occurring in about energy dissipation and other uses, pipe networks.	Analyzing
			CO5	Evaluate the length, Height and Location of jump in open channel flows.	Evaluating
			CO6	Design the branching of pipes at desired locations to supply water by following suitable counter measures for uninterrupted flow.	Creating
2	PC323CE	Structural Engineering Design and Detailing	CO1	Define the characteristic strength of materials and partial safety factors for load and materials&Explain the design philosophies of working stress method and Limit state method	Understanding
			CO2	Apply the key concepts, theories and mathematical fundamentals to analyze and design the structural elements	Applying
			CO3	Analyze the structural elements for flexure, shear and torsion	Analyzing
			CO4	Examine the serviceability and durability of structural elements	Analyzing
			CO5	Decide the safety of the design as per IS code specification to choose the more safe and economical design of a structural member	Evaluating
			CO6	Design simple structural members to be able to safely resist bending, shear , torsion, deflection and compression within the imposed factors of safety	Creating
			CO1	Explain the classification of soils	Understanding

3	PC324CE	Geotechnical Engineering	CO2	Calculate the Permeability and seepage in Soil	Applying
			CO3	Determine the Compaction characteristics in Soils .	Applying
			CO4	Determine the Shear strength in Soils	Applying
			CO5	Explain and analyse the Earth pressures in Retaining Walls	Analysing
			CO6	Explain and analyse the stability of finite and infinite Earthen slopes	Analysing
4	PC325CE	Hydrology and Water Resources Engineering	CO1	Define the essential components and function of the hydrologic cycle including precipitation, evaporation/evapotranspiration, infiltration .	Remembering
			CO2	Explain different methods that can be used to measure rainfall and flow, as well as their relative advantages and disadvantages and find out average rainfall in a catchment area	Understanding
			CO3	Develop relationship between Rainfall-Runoff using hydrograph, flood frequency analysis, empirical methods rational method , and SCS-CN method	Applying
			CO4	Estimate ground water resources for different hydro-geological boundary conditions and explain the basic aquifer parameters and	Evaluating
			CO5	Determine crop water requirement	Evaluating
			CO6	Analyze the knowledge for various concepts of canal design.	Analyzing
5	PC326CE	Transportation Engineering	CO1	Explain the road network development and Highway planning in India	Understanding
			CO2	Design various geometric elements of the roads based on the geographical conditions	Creating
			CO3	Explain the different traffic characteristics and analyze the data	Understanding
			CO4	Analyze various highway materials for their suitability for highway construction	Analysing
			CO5	Apply different design methods for pavement construction	Applying
			CO6	Explain the principles of construction and maintenance of highways	Understanding
6	PC321CE	Structural Analysis	CO1	Determine degree of static and kinematic indeterminacies of beams and frames and to analyze its responses under external load using Moment Distribution Method and plotting their responses in SFD and BMD	Applying
			CO2	Perform analysis of Continuous beams and frames using Slope Deflection Method and plotting their responses in SFD and BMD	Evaluating
			CO3	Analyze Continuous beams and frames using Rotation Contribution (Kani's) Method and plotting their responses in SFD and BMD	Analysing



			<b>CO4</b>	<b>Explain</b> the analysis of structural elements subjected to moving loads & the analysis of road/railway bridges and gantry girders.	Analysing
			<b>CO5</b>	<b>Analyze</b> cable suspension bridges along with three hinged stiffening girder for static lo	Analysing
			<b>CO6</b>	<b>Analyze</b> the three hinged arches for moving loads.	Analysing

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**B.E VII SEMESTER**

<u>S.no</u>	<u>Course Code</u>	<u>Course Title</u>	<u>CO No.</u>	<u>Course Outcome</u>	
					<b>Taxonomy level</b>
<b>1</b>	<b>PC701CE</b>	<b>Structural Engineering and Drawing-II (Steel)</b>	CO1	<b>Explain</b> the behavior of plate girder, gantry girder and bearings under various loading conditions (such as axial, bending, shear, combinations and multi-axial bending).	Understanding
			CO2	<b>Apply</b> the given loading conditions to structural elements by selecting members from IS HAND BOOK number1 and checking them for stresses and deflections.	Applying
			CO3	<b>Make use of</b> mathematically formulated stress-strain relations and basic strength of materials theories and formulae based on elastic theories and plastic theories to solve for the stresses, strains and associated quantities in girders subjected to various loadings.	Applying
			CO4	<b>Examine</b> the structures elemental behaviour subjected to various load types by constructing and analyzing diagrams such as Stress-Strain diagram, Influence line diagrams.	Analyzing
			CO5	<b>Evaluate</b> two or more geometries and/or materials to choose the more safe and economical design of a structural member.	Evaluating
			CO6	<b>Design</b> simple structural members to be able to safely resist axial, bending, shear and combined stresses within the imposed factors of safety.	Creating
			CO2	<b>Outline</b> the procedures adopted for tendering and allotment of contracts and the role of IT in tenders and allotment of contracts.	Understanding

2	PC702CE	Estimation costing & Specifications	CO3	<b>Make use of</b> standard available procedures and forms like Measurement books, Muster roll, bill of quantities, Schedule of rates in estimation works	Applying
			CO4	<b>Analyze</b> rates of different items of work based on specifications using Schedule of rates.	Analyzing
			CO5	<b>Develop</b> an estimate with the support of computer software / Excel sheets / MS Project.	Creating
			CO6	<b>Develop</b> an estimate of quantities of different items for buildings, roads, irrigation structures and different civil engineering structures.	Creating
3	PC703CE	Finite Element Techniques	CO1	<b>Choose</b> from potential energy and virtual displacement concepts to <b>formulate</b> and solve finite element problems.	Evaluating
			CO2	<b>Perceive</b> the concept of finite element method for various types of elements and also the use of commercial packages for complex problems.	Evaluating
			CO3	<b>Evaluate</b> manually problems of Structural systems involving bars, trusses, beams and frames.	Evaluating
			CO4	<b>Develop</b> 2-D FE formulations involving triangular, rectangular, quadrilateral elements, higher order elements and axi-symmetric elements.	Applying
			CO5	<b>Analyzing</b> the elements displacements for stress and strain parameters.	Analyzing
			CO6	<b>Develop</b> shape functions for various elements and solve simple design problems.	Creating
			CO1	<b>Demonstrate</b> and recognise the importance of materials used in PSC work and to demonstrate the prestressing methods and techniques	Understanding

4	PC704CE	Prestressed Concrete	CO2	<b>Explain</b> the behaviour of a PSC beam section under given prestress and loads and determine the losses in prestressing.	Evaluating
			CO3	Extend the knowledge of analysis to <b>design</b> a PSC beam section for the given conditions.	Creating
			CO4	<b>Analyze</b> the Shear failure of a PSC beam and outline the procedure for safe shear design of PSC beams	Analysing
			CO5	<b>Determine</b> the deflections which occur in PSC elements and Compare the short term and long term deflection	Evaluating
			CO6	<b>Assess</b> the extent of bursting tension in the end block of a PSC beam and develop the method of strengthening the end block	Evaluating
5	PC705CE	Foundation Engineering	CO1	Discuss and <b>calculate</b> the stress distribution in soils	Applying
			CO2	<b>Classify</b> the types of Foundations and to calculate their Bearing capacity	Analysing
			CO3	<b>Discuss &amp; Design</b> of various types of Pile Foundation and well foundation	Creating
			CO4	<b>Discuss</b> the necessity of Geotechnical Investigations	Understanding
			CO5	<b>Discuss</b> about the Foundation related aspects	Understanding
			CO6	<b>Categorize</b> and Outline various records of Investigation for Foundations	Analysing
7	OE775ME	Entrepreneurship Development	CO1	<b>Explain</b> the economic growth and relate the types of enterprises in the Industrial Environment.	Understanding
			CO2	<b>Identify</b> the characteristics of entrepreneurs, environmental influence and source of ideas	Applying
			CO3	<b>Analyze</b> the market, finance and technology for project formulation.	Analyzing
			CO4	<b>Evaluate</b> projects using CPM, PERT techniques and assess the tax burden	Evaluating
			CO5	<b>Explain</b> the leadership and motivational models for entrepreneurship development.	Understanding
			CO6	<b>Explain</b> the Time Management and its various approaches for Entrepreneurship development.	Understanding
			CO1	<b>Analyze</b> and design software requirements in an efficient manner	Understanding

8	OE782IT	Software Engineering	CO2	<b>Make Use of</b> open source case tools to develop software	Applying
			CO3	<b>Implement</b> the design, debug and test the code	Applying
			CO4	<b>Take part in</b> using advanced & behavioral modeling to develop a case study.	Analyzing
			CO5	<b>Design</b> the activities with the help of behavioral modeling.	Evaluating
			CO6	<b>Develop</b> components through architectural modeling.	Creating
			9	PC751CE	Computer Applications Lab
CO2	<b>Make use of</b> software tool to analyze and design of RCC beams using limit state d	Applying			
CO3	<b>Develop</b> computer programs structural engineering problems	Creating			
CO4	<b>Make use of</b> Civil Engineering software STAAD PRO for analysis and design of b	Applying			
CO5	<b>Analyze</b> and solve problems related to hydraulic structures using software.	Analysing			
CO6	<b>Solve</b> the bearing capacity and other geotechnical related problems using software.	Applying			
10	PC761CE	Internships	CO1	<b>Identify</b> career alternatives prior to graduation	Applying
			CO2	<b>Relate</b> theory and practice	Understanding
			CO3	<b>Develop</b> work habits and attitudes necessary for job success	Creating
			CO4	<b>Develop</b> communication, interpersonal and other critical skills in the job interview	Creating
			CO5	<b>Build</b> a record of work experience	Creating
			CO6	<b>Make use of</b> employment contacts leading directly to a full-time job following gra	Applying