

METHODIST COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

Academic Year 2019-20

B.E III SEMESTER

<u>S.no</u>	<u>Course Code</u>	<u>Course Title</u>	<u>CO No.</u>	<u>Course Outcome</u>	<u>Taxonomy level</u>
1	MC112CE	Environmental Science	CO1	Explain Environmental ethics and verbally discuss environmental issues to attain sustainable development.	Understanding
			CO2	List out common and adverse human impacts on biotic communities, soil, water, and air quality and suggest sustainable strategies to mitigate these impacts	Remembering
			CO3	Identify various levels, values and threats of biodiversity and bio-geographical classification of India.	Applying
			CO4	Explain social and environmental issues to prevent future damage of the environment.	Understanding
			CO5	Explain the importance of Environmental legislation policies.	Understanding
			CO6	Classify the types of environmental pollution and the various treatment technologies for the diminution of environmental pollutants and contaminants.	Understanding
2	MC113PY	Essence of Indian Traditional Knowledge	CO1	Outline the history of civilization in Indian context since pre-Vedic times	Understanding
			CO2	Outline the various schools of Indian Philosophy	Understanding
			CO3	Demonstrate the diversity in Indian Thought , Languages , regional culture , dress, living style etc.	Understanding
			CO4	Identify the various religious and social reform movements which took place in the past few centuries	Applying
			CO5	Classify the wealth of Indian Fine Arts and the diversity associated with it over the length and breadth of the country	Understanding
			CO6	List the various subjects which flourished in ancient system of education and the progression thereof to modern India.	Remembering
3	MC204CE	Overview of Civil Engineering	CO1	Illustrate the relevance of civil engineering in the society & describe the uses of various construction materials	Understanding
			CO2	Explain the new technology/concepts of architecture in planning	Understanding
			CO3	What are the basics of surveying, transportation and geotechnical systems.	Remembering
			CO4	What are the basics of environmental, water resources.	Remembering
			CO5	What is Structural engineering systems	Remembering
			CO6	Which are the various software used in the field of civil engineering	Remembering
			CO1	Apply the Concepts , theory in Industrial perspective	Applying

4	HS203PS	Industrial Psychology	CO2	Explain the role played of psychological factors like Motivation , Human needs , Incentives , Job satisfaction , Counselling etc . , and their application in Industry	Understanding
			CO3	Evaluate Consumer behaviour towards production enhancement	Evaluating
			CO4	Evaluate the present work methods and analyze their deficiencies and identify corrective methods	Analyzing
			CO5	Identify the consequences of disturbing work environment due to factors like Noise , Illumination , Atmospheric conditions , work efficiency, fatigue etc. and discuss to mitigate them.	Applying
			CO6	Examine a Holistic and Humane approach and apprise workers in Industry	Analyzing
5	BS206BZ	Biology for Engineers	CO1	Recall the diversity in the living world	Remembering
			CO2	Compare between microorganisms, plants, animals and the human system.	Understanding
			CO3	Choose the organism for its employment in real time design and planning applications.	Evaluating
			CO4	Use of the knowledge of organism their systems and utilize to simulate, design and in planning applications.	Creating
			CO5	Utilise the knowledge to analyze, distinguish and draw inference about the functioning of the living systems.	Analyzing
			CO6	Apply the fundamental knowledge in projects related to human society.	Applying
6	ES211CE	Engineering Mechanics	CO1	Apply the fundamental concepts of forces, equilibrium conditions for static loads.	Applying
			CO2	Determine the Centroid and moment of inertia for cross various sections.	Evaluating
			CO3	Analyse the forces in the members of a truss using method of joints and method of sections	Analysing
			CO4	Explain the concept of friction for single and connected bodies.	Understanding
			CO5	Apply the basic concepts of dynamics, their behavior, analysis and motion bodies	Applying
			CO6	Solve problems involving work energy principles and impulse momentum theory.	Applying
7	ES213ME	Energy Sciences and Engineering	CO1	Explain the basics of various sources of energy.	Understanding
			CO2	Analyse the present status of conventional energy sources	Analysing
			CO3	Illustrate the working principles of Renewable Energy systems	Understanding
			CO4	Analyse and Compare waste heat recovery systems and energy storage.	Analysing
			CO5	Relate energy economics, standards and future challenges	Understanding
			CO6	Explain causes of pollution, control methods and relate to pollution standards	Understanding
			CO1	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

8	PC221CE	Solid Mechanics	CO2	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
			CO3	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
			CO4	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
			CO5	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
			CO6	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
9	PC222CE	Engineering Geology	CO1	Define the process of weathering, formation of minerals, rocks, soil and concept of geomorphology and how they relate with each other	Remembering
			CO2	Illustrate 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	Demonstrate 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	Interpret 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	Illustrate the geological problems in dams, reservoirs and tunnels.	Understanding
			CO6	Explain the geological causes, merits & demerits of earthquakes, tsunamis and landslides.	Understanding
10	PC223CE	Surveying & Geomatics	CO1	Explain the terminologies and concepts involved in basic and modern surveying equipments & technologies and also defines the concepts of horizontal and vertical curves.	Understanding
			CO2	Demonstrate the working principles and applications of basic and modern surveying instruments like chain, prismatic compass, plane table, dumpy level, theodolite and total station.	Understanding
			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
11	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
12	PC252CE	Surveying Lab	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
			CO3	Demonstrate the levelling instruments and apply the knowledge of levelling in finding out the reduced levels of ground	Applying
			CO4	Demonstrate the working principles and handling procedures of theodolite and total station	Understanding
			CO5	Make use of theodolite in finding out horizontal and vertical angles and also in setting out horizontal curves	Applying
			CO6	Apply 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 IV SEMESTER

S.no	Course Code	Course Title	CO No.	Course Outcome	Taxonomy level
1	MC111PO	Indian Constitution	CO1	Explain the conditions prior to evolution of Indian Constitution	Understanding
			CO2	Explain the structure of Governance in Post Independent India and powers and limitations of the executive	Understanding
			CO3	Relate the importance of Fundamental rights and associated duties as enshrined in the constitution	Understanding
			CO4	Develop the relationship between central and state governments in terms of duties and responsibilities	Applying
			CO5	Summarize the role of statutory bodies like Election Commission , NHRC , NCW	Understanding
			CO6	Explain the role of constitutions of different countries and the contributions of leaders	Understanding
2	HS201EG	Effective Technical Communication in English	CO1	Define the fundamentals of Technical Communication and relate the knowledge to differentiate between general and technical writing.	Remembering
			CO2	Demonstrate the ability to choose the right mode of Written Communication in Official Correspondence	Understanding
			CO3	Classify various types of Reports to competently use them based on the requisite	Analyzing
			CO4	Determine the importance of using and writing different kinds of Manuals along with their Classification	Evaluating
			CO5	Make use of various kinds of visual aids and develop the skill to use them appropriately in their presentations	Applying
			CO6	Compile both Oral and Visual Presentation Skills to be able to adapt to the changing scenario of the present	Creating
3	HS202CM	Finance & Accounting	CO1	Explain the financial and Accounting aspects of a business	Understanding
			CO2	Evaluate financial Performance of the business unit.	Evaluating
			CO3	Illustrate about the financial system and markets.	Understanding
			CO4	Evaluate the viability of projects by using Capital budgeting Techniques.	Evaluating
			CO5	Analyse the overall financial functioning of an Enterprise.	Analyzing
			CO6	Outline the decision on procurement of finances.	Understanding
4	BS205MT	Mathematics-III	CO1	Find solutions of first order and second order partial differential equations.	Remembering
			CO2	Apply Fourier series to find solutions of partial differential equations.	Applying
			CO3	Solve complex and real integrals using residue theorem.	Applying
			CO4	Analyze a given function in the form of Fourier series	Analyzing
			CO5	Determine the analyticity of a complex functions and expand functions as Taylor and Laurent series.	Evaluating
			CO6	Classify types of partial differential equations and find their solution.	Understanding
5	ES212ME	Elements of Mechanical Engineering	CO1	Demonstrate the mechanical engineering components working principle and apply mathematical formulae	Understanding
			CO2	Recall and formulate the formulas related to engines,gasturbines,power transmission elements.	Remembering
			CO3	Analyze and interpret the data by understanding the problems related to prime movers and other mechanical systems	Analyzing
			CO4	Demonstrate the working of machines and contribute toward health,safety of society.	understanding
			CO5	Apply the basics of mechanical engineering and design the mechanical systems which are environment friendly	Applying

6	PC231ME	Mechanics of Materials and Structures	CO6	Apply ethical principals in designing mechanical systems.	Applying
			CO1	Apply the basic concepts of engineering for various structures & types of loadings applied.	Applying
			CO2	Evaluate the crippling load of columns for various end conditions using different formulas	Evaluating
			CO3	Solve the deflections of determinate beams due to transverse loads by various methods	Applying
			CO4	Analyse statically indeterminate beams such as propped cantilever, fixed beams and continuous beams and draw the shear force and bending moment diagrams	Analysing
			CO5	Analyse the beams and frames and to find deflections by energy principle	Analysing
			CO6	Analyse the three hinged and two hinged arches, cables and suspension bridges	Analysing
7	PC232CE	Fluid Mechanics	CO1	Define the fluid properties and pressure measurement by using different manometers. (like Specific wei	Remembering
			CO2	Evaluate the pressure measurement by using different types of manometers	Evaluating
			CO3	Compare different types of flow patterns and different types of fluid flows	Understanding
			CO4	Apply basic physics fundamentals and obtain the pressure drop in flow systems.	Applying
			CO5	Evaluate the discharge of flow by using different flow meters	Evaluating
			CO6	Apply Euler's, Bernoulli's and Momentum equation to solve fluid dynamic problems	Applying
8	PC233CE	Materials : Testing and Evaluation	CO1	Explain the types of construction materials like bricks, stones, steel, timber and their uses	Understanding
			CO2	Explain the composition, properties and tests of cement and aggregates	Understanding
			CO3	Explain the requirements of quality of water and effect of water impurities on properties of concrete	Understanding
			CO4	Classify the types of admixtures and their functions	Understanding
			CO5	Explain the manufacturing of concrete, properties and tests of fresh & hardened concrete	Understanding
			CO6	Explain the types, properties of miscellaneous building materials like pointing, white & color washing,	Understanding
9	PC261CE	Solid Mechanics Lab	CO1	Examine behaviour of a ductile material under direct tension & twisting and determine elastic properties using the stress-strain curve and Hooke's law	Applying
			CO2	Determine the hardness of various metals like steel, brass, copper, aluminium etc.	Applying
			CO3	Calculate the compressive strength of different engineering materials	Applying
			CO4	Determine the flexural properties of beams (simply supported, cantilever and fixed) made of different materials like wood, steel, copper etc.	Applying
			CO5	Determine the Spring stiffness, Capacity and shear modulus using the Tension and Compression tests on Springs	Applying
			CO6	Evaluate the impact resistance capacity and energy absorption of various materials using impact tests	Evaluating
10	PC262CE	Materials : Testing and Evaluation Lab	CO1	Determine the different properties of Cement like Standard consistency, Initial and final setting time, Compressive strength etc.	Understanding
			CO2	Identify the different properties of fine aggregates like Fineness modulus, Bulk density, Bulking etc.	Understanding
			CO3	Determine the various properties of Coarse aggregates	Understanding
			CO4	Determine the workability of concrete	Understanding
			CO5	Determine the mechanical behavior of concrete subjected to Tension, compression, flexure	Understanding
			CO6	Determine the compressive strength and water absorption	Understanding

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B.E V SEMESTER

S.no	Course Code	Course Title	CO No.	Course Outcome	Taxonomy level
1	PC501CE	Reinforced Cement Concrete	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
2	PC502CE	Theory of Structures - I	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	Evaluating
			CO2	Analysis of Continuous beams and frames using Slope Deflection Method and plotting their responses in SFD and BMD	Analysing
			CO3	Analyse Continuous beams and frames using Rotation Contribution (Kani's) Method and plotting their responses in SFD and BMD	Analysing
			CO4	Apply strain energy principles for the displacements and Redundant forces of Trusses and displacements of beams and Frames.	Applying
			CO5	Evaluate the stresses generated in determinate and indeterminate arches of various geometries by applying strain energy principles.	Evaluating
			CO6	Evaluate beams and frames using unit load, fictitious and virtual work method	Evaluating
3	PC503CE	Concrete Technology	CO1	Identify the functional role of ingredients of concrete and apply this knowledge to mix design philosophy	Applying
			CO2	Explain the fresh and hardened properties of concrete	Understanding
			CO3	Evaluate the effect of the environment on service life performance, properties and failure modes of structural concrete and demonstrate techniques of measuring the Non Destructive Testing of concrete structure	Evaluating
			CO4	Develop an awareness of the utilization of waste materials as novel innovative materials for use in concrete	Applying

			CO5	Design a concrete mix which fulfils the required properties for fresh and hardened concrete	Creating
			CO6	Adapt the concepts of mix design according to American standards, British standards and Indian standards and comparison of standards and durability concepts for each type of mix	Creating
4	PC504CE	Hydraulic Machines	CO1	Explain the significance of reynold's, Froude and Mach similarity laws.	Understanding
			CO2	Define the different types of pumps on the basis of principle on which it works.	Remembering
			CO3	Make Use of the knowledge in selection of hydraulic turbines and pumps	Applying
			CO4	Apply the basic principles in the design of Hydraulic Machines	Applying
			CO5	Analyse the turbine/pump laws and constant for hydraulic design.	Analyzing
			CO6	Develop the pipe network systems with given friction and velocity in pipes	Creating
5	PC505CE	Transportation Engineering -I	CO1	Explain the fundamentals of highway planning and perform geometric design of a transportation facility	Understanding
			CO2	Determine the key elements on various traffic studies, present and analyze traffic data.	Evaluating
			CO3	Interpret basic concepts of material characterization as per standard specifications including mix design.	Understanding
			CO4	Design flexible pavements as per IRC guidelines.	Creating
			CO5	Design rigid pavements as per IRC guidelines.	Creating
			CO6	Make use of various construction techniques adopted in field, identify the causes of various pavement failures and suggest appropriate treatment.	Applying
6	PC506CE	Environmental Engineering	CO1	Identify the sources of water and estimate the water quality	Applying
			CO2	Determine the water demand for different cities and Design the water supply network	Applying
			CO3	Design the components of water treatment plant	Creating
			CO4	Calculate the sewage flow using different approaches through various sources and Design the c	Analysing
			CO5	Explain the knowledge on sludge, solid waste treatment and disposal	Understanding
			CO6	Design of septic tank, oxidation ponds and RBC and its components	Creating
7	PC507CE	Water Resource Engineering -I	CO1	Define water rights and water quality management principles , types of dams and spillways	Remembering
			CO2	Classify between Single and multipurpose projects, dams, irrigation tanks, spillways and spillwa	Understanding
			CO3	Apply the knowledge of storage works and regulatory systems	Applying
			CO4	Analyze the structural stability of different storage works	Analysing
			CO5	Design different types of storage works and fixation of different levels of reservoirs (LWL, FRL)	Creating
			CO6	Apply the Design of different types of storage works and regulatory systems as per USBR guide	Applying
			CO1	Illustrate the basic theory of infrastructure engineering, Defining, economic zone and Compare urban infrastructure and Rural Infrastructure projects, Summarize, the Infrastructure Projects in power Sector, Water Supply and Sanitation Sector, Transportation Sector.	Understanding

8	PE503CE	Infrastructure Engineering	CO2	Explain Infrastructure Privatization, Compare public and private sector role in infrastructure development, Define Problems with Infrastructure Privatization	Understanding
			CO3	Explain infrastructure planning and implementation, Identifying Risks related to infrastructure Projects.	Understanding
			CO4	Assess the Social & Environmental impacts due to infrastructure Projects. List the Environmental laws.	Evaluating
			CO5	Explain the strategies for successful Infrastructure project implementation, Risk Management framework For infrastructure projects.	Understanding
			CO6	Explain the role of Government in infrastructure implementation.	Understanding
9	PC551CE	Fluid Mechanics Lab - II	CO1	Explain the flow and fluid properties	Understanding
			CO2	Identify the competence in working principles of hydraulic pumps and turbines	Applying
			CO3	Assess the flow measuring devices used in pipes, channels and tanks.	Evaluating
			CO4	Classify the Laminar and Turbulent flows.	Understanding
			CO5	Apply the practical knowledge of fluid mechanics in engineering field problems.	Applying
10	PC552CE	Transportation Engineering Lab	CO1	Identify the grade & properties of bitumen	Applying
			CO2	Create the awareness about various traffic studies in the field	Creating
			CO3	Find out peak hour traffic & peak time for a given location on the road	Remembering
			CO4	Find design speed, maximum speed & minimum speed limits of a location through spot speed	Remembering
			CO5	Identify engineering properties of aggregate	Applying
			CO6	Explain mix design of bitumen and CBR test etc	Understanding
11	PC553CE	Environmental Engineering Lab	CO1	Determine physical, chemical and biological characteristics of water and wastewater	Applying
			CO2	Outline the procedure for preparations of stock and standard solutions, their handling, storage, e	Understanding
			CO3	Determine break - point chlorination	Applying
			CO4	Assess the suitability of water for drinking, irrigation purpose and concreting works.	Evaluating
			CO5	Determine the BOD, COD and bacterial density of portable water.	Applying
			CO6	Assess the quality of water and wastewater	Evaluating

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B.E VI SEMESTER					
S.no	Course Code	Course Title	CO No.	Course Outcome	Taxonomy level
1	PC601CE	Steel Structures	CO1	Explain the connections in steel sections	Understanding
			CO2	Explain the differences of welded and bolted connections	Understanding
			CO3	Explain the basics of design of steel structures and adapt IS codal provisions	Understanding
			CO4	Explain the design of different types of connections.	Understanding
			CO5	Estimate the design of tension, compression members, column bases and beams.	Creating
			CO6	Explain the design of roof trusses.	Understanding
2	PC602CE	Structural Engineering Design & Detailing-I	CO1	Explain the behavior of soil pressure on combined footing and principles of design, understand the concepts of water tank design philosophies and bridge slab design & Understanding the IRC loadings for the analysis of bridges according to IRC5: 2000 and IRC6: 2000	Understanding
			CO2	Analyse cantilever and counter fort retaining walls for different load conditions with limit state method according to IS 456: 2000	Analysing
			CO3	Analyse water tanks, resting on ground and overhead water tanks according to IS3370: 2009	Analysing
			CO4	Design rectangular combined footing and understand the principles of design of trapezoidal footing with limit state method according to IS 456: 2000	Creating
			CO5	Design of cantilever type and counter fort type retaining walls. Design of staging of water tanks	Creating
			CO6	Design of Deck Slab bridge and T-beam bridge with IRC loadings according to IRC21: 2000	Creating
3	PC603CE	Theory of Structures-II	CO1	Define various terminology involved in analysis of complex structural problems and indeterminate structures.	Remembering
			CO2	Explain the basics of Engineering sciences in analyzing structures subjected to moving loads.	Understanding
			CO3	Apply basic concepts to analyze structures subjected to moving loads by drawing ILD's and compute its Reactions, Maximum Shear Force and Bending moment.	Applying
			CO4	Analyse indeterminate structures through matrix methods of analysis (Flexibility and Stiffness methods), and Direct element approach.	Analysing
			CO5	Determine the impact of cables and suspension bridges on structures.	Evaluating
			CO6	Select FEM based Software's for design and analysis of Structures.	Remembering
			CO1	Define the different components of hydraulic structures.	Remembering

4	PC604CE	Water Resources Engineering –II	CO2	Explain the concepts of canals, weirs, seepage forces, canal falls types, regulators ; modules and cross drainage works.	Understanding
			CO3	Make use of the Garrette’s diagram for design of canals, fixation of still level of head sluice, scouring sluice and crest level of weir and selection of cross drainage works.	Applying
			CO4	Analyze the causes of failure of structure on permeable foundations, significance of exit gradient.	Analysing
			CO5	Evaluate different possible hydraulic structures to choose the more safe and economical design for conveyance and storage of water for the needy.	Evaluating
			CO6	Design of lined canals, Head regulators, vertical Drops, sloping glacis weir, surface & sub-surface flow, length- level-thickness of D/S apron , U/S & D/S Cutoffs, protection works, types of Cross Drainage works.	Creating
5	PC605CE	Soil mechanics	CO1	Explain the classification of soils	Understanding
			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
6	PC606CE	Transportation Engineering-II	CO1	Classify railway lines, gauges, tracks, level crossings, air crafts and airport terminals along with their characteristics.	Understanding
			CO2	Explain the requirements of alignment and its surveys and the permanent way components with its functions.	Understanding
			CO3	Identify the elements of railway geometric design.	Applying
			CO4	Illustrate the design, techniques for construction and maintenance of railway track.	Understanding
			CO5	Make use of ICAO standards and guidelines for selecting a site for airport and geometric design	Applying
			CO6	Identify and draw wind rose diagrams and the corrected runway length.	Applying
7	PE 602 CE	Ground Improvement Techniques	CO1	Explain terminologies in Ground improvement techniques and various materials used in it	understanding
			CO2	Explain the necessity of ground improvement and potential of a particular site to with stand the infrastructure.	understanding
			CO3	Identify the appropriate techniques in the improvement of in situ cohesive soils as well as Cohesion less soils	Applying
			CO4	Analyze an in-situ site, Select the ideal method to attain desired levels of improvement.	Analysing
			CO5	Evaluate the proposed plan of action in improving ground stability that substantiate the structural loads.	Evaluating

			CO6	Build a plan so that project being managed and executed to obtain required level of ground stability.	Applying
8	OE601ME	Industrial Robotics	CO1	Explain the mechanical structure of industrial robots, operational workspace, various types of grippers, design considerations.	Understanding
			CO2	Compare the various types of grippers, sensors and Analyze the best and economical sensors for specific applications.	Understand & Analyzing
			CO3	Analyze forward and inverse kinematics problems for serial and parallel robots.	Applying
			CO4	Explain the techniques of robot vision, various programming languages and apply these techniques to build robots.	Understanding & Applying
			CO5	Explain about RGV and AGV , safety considerations and economic analysis of robots	Understanding
			CO6	Categorize an industrial robot for a given purpose economically.	Analyzing
9	OE602ME	Material Handling	CO1	Explain working of various conveying systems, bulk solids handling systems, equipment used in each system and modern material handling systems that available in industry	Understanding
			CO2	Identify the problems in manual work and factors influencing the selection of equipment.	Applying
			CO3	Distinguish one material handling system with other along with their merits and demeris.	Analyzing
			CO4	Distinguish one material handling system with other along with their merits and demeris.	Analyzing
			CO5	Analyze different material handling systems and can implement effective material handling system which is ergonomic in nature.	Analyzing
			CO6	Estimate number of MH systems required, storage space, cost and maintenance	Evaluating
10	PC651CE	Soil Mechanics Lab	CO1	Determine the Index properties of Soil	Evaluating
			CO2	Determine the Atterberg's limits of fine grained Soil	Evaluating
			CO3	Identify and classify the soil the soil	Analysing
			CO4	Calculate the Permeability of Soils	Analysing
			CO5	Determine the Engineering properties of Soil	Evaluating
			CO6	Determine the Shear Parameters of Soil by Direct Shear Test	Evaluating
11	PC652CE	Concrete Technology Lab	CO1	Identify functional role of ingredients of concrete	Applying
			CO2	Assess the different properties of aggregate	Evaluating
			CO3	Summarize the concept of workability and testing of concrete.	Understanding
			CO4	Apply fundamental knowledge in the fresh and hardened properties of concrete	Applying
			CO5	Apply this knowledge to mix design philosophy to get different grade of concrete	Applying

			CO6	Take part in team work to achieve the objective	Analyzing
12	PW661CE	Survey Camp	CO1	Apply surveying knowledge and tools effectively for projects	Applying
			CO2	Develop knowledge of practical application of different survey works	Applying
			CO3	Organise tasks, goals and responsibilities	Applying
			CO4	Build interpersonal communication skills	Applying
			CO5	Develop their leadership qualities as well as ability to work in teams	Applying
			CO6	Create a report on topics based on work done during the survey camp	Creating

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B.E VII SEMESTER

S.no	Course Code	Course Title	CO No.	Course Outcome	Taxonomy level
1	PC701CE	Structural Engineering and Drawing-II (Steel)	CO1	Explain 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	Apply the given loading conditions to structural elements by selecting members from IS HAND BOOK number1 and checking them for stresses and deflections.	Applying
			CO3	Make use of 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	Examine the structures elemental behaviour subjected to various load types by constructing and analyzing diagrams such as Stress-Strain diagram, Influence line diagrams.	Analyzing
			CO5	Evaluate two or more geometries and/or materials to choose the more safe and economical design of a structural member.	Evaluating
			CO6	Design simple structural members to be able to safely resist axial, bending, shear and combined stresses within the imposed factors of safety.	Creating
2	PC702CE	Estimation costing & Specifications	CO1	Define and Demonstrate a basic knowledge on types of estimates, tenders, contracts and different specifications required for construction works.	Understanding
			CO2	Outline the procedures adopted for tendering and allotment of contracts and the role of IT in tenders and allotment of contracts.	Understanding
			CO3	Make use of standard available procedures and forms like Measurement books, Muster roll, bill of quantities, Schedule of rates in estimation works	Applying
			CO4	Analyze rates of different items of work based on specifications using Schedule of rates.	Analyzing
			CO5	Develop an estimate with the support of computer software / Excel sheets / MS Project.	Creating

			CO6	Develop an estimate of quantities of different items for buildings, roads, irrigation structures and different civil engineering structures.	Creating
3	PC703CE	Finite Element Techniques	CO1	Choose from potential energy and virtual displacement concepts to formulate and solve finite element problems.	Evaluating
			CO2	Perceive the concept of finite element method for various types of elements and also the use of commercial packages for complex problems.	Evaluating
			CO3	Evaluate manually problems of Structural systems involving bars, trusses, beams and frames.	Evaluating
			CO4	Develop 2-D FE formulations involving triangular, rectangular, quadrilateral elements, higher order elements and axi-symmetric elements.	Applying
			CO5	Analyzing the elements displacements for stress and strain parameters.	Analyzing
			CO6	Develop shape functions for various elements and solve simple design problems.	Creating
4	PC704CE	Prestressed Concrete	CO1	Demonstrate and recognise the importance of materials used in PSC work and to demonstrate the prestressing methods and techniques	Understanding
			CO2	Explain 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 design a PSC beam section for the given conditions.	Creating
			CO4	Analyze the Shear failure of a PSC beam and outline the procedure for safe shear design of PSC beams	Analysing
			CO5	Determine the deflections which occur in PSC elements and Compare the short term and long term deflection	Evaluating
			CO6	Assess 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 calculate the stress distribution in soils	Applying
			CO2	Classify the types of Foundations and to calculate their Bearing capacity	Analysing
			CO3	Discuss & Design of various types of Pile Foundation and well foundation	Creating
			CO4	Discuss the necessity of Geotechnical Investigations	Understanding
			CO5	Discuss about the Foundation related aspects	Understanding
			CO6	Categorize and Outline various records of Investigation for Foundations	Analysing

6	OE774EE	Non- Conventional Energy Sources	CO1	Explain the different types of conventional and non conventional energy sources	Understanding
			CO2	Discuss the working of different fuel cells	Understanding
			CO3	Discuss the solar energy power development and its application	Understanding
			CO4	Explain the principle of wind energy conversion system and conversion methods	Understanding
			CO5	Discuss the energy conversion from ocean in terms of tides, waves, thermal and also the energy from Geo thermal	Understanding
			CO6	Demonstrate the methods of biomass energy conversion and prospects	Understanding
7	OE775ME	Entrepreneur ship	CO1	Explain the economic growth and relate the types of enterprises in the Industrial Environment.	Understanding
			CO2	Identify the characteristics of entrepreneurs, environmental influence and source of ideas	Applying
			CO3	Analyze the market, finance and technology for project formulation.	Analyzing
			CO4	Evaluate projects using CPM, PERT techniques and assess the tax burden	Evaluating
			CO5	Explain the leadership and motivational models for entrepreneurship development.	Understanding
			CO6	Explain the Time Management and its various approaches for Entrepreneurship development.	Understanding
8	OE782IT	Software Engineering	CO1	Relate an appropriate process model for assessing software project development.	Understanding
			CO2	Build necessary requirements for project development eventually composing SRS	Applying
			CO3	Analyze various life cycle activities like analysis, design, implementation, testing and maintenance	Applying
			CO4	Survey visual models to describe non-algorithmic solutions for project build out.	Analyzing
			CO5	Choose solutions for recurring problems development exerting knowledge on design principals and patterns.	Evaluating
			CO6	Determine product quality through testing techniques, employing appropriate metrics	Evaluating
9	PC751CE	Computer Applications Lab	CO1	Demonstrate the software skills to solve civil engineering related analysis and design	Understanding
			CO2	Make use of software tool to analyze and design of RCC beams using limit state design	Applying
			CO3	Develop computer programs for structural engineering problems	Creating
			CO4	Make use of Civil Engineering software STAAD PRO for analysis and design of basic elements of structure	Applying
			CO5	Analyze and solve problems related to hydraulic structures using software.	Analysis
			CO6	Solve the bearing capacity and other geotechnical related problems using software.	Applying

10	PW761CE	Project Work -1	CO1	Choose a particular topic/ research paper from Civil Engineering and define the basic outline or summary of the topic / research paper.	Evaluating
			CO2	Explain the Literature review of selected topic/research paper.	Understanding
			CO3	Asses various sophisticated technologies and methodologies available in the field of civil Engineering	Evaluating
			CO4	Improve oral and written communication skills and draft a report on the study applying the basic knowledge of Civil Engineering.	Creating
			CO5	Develop ethics by framing the required documentation without plagiarism	Creating
			CO6	Make use of MS Office utilities in making the presentation and Report.	Applying
11	SI 762 CE	Summer Internship	CO1	Learn how to approach an industry and get permission	
			CO2	Make technical visit to that plant/sit	
			CO3	Learn the Civil Engineering aspects of that plant/site	
			CO4	Build interpersonal communication skills	
			CO5	Develop their leadership qualities as well as ability to work in teams	
			CO6	Create a report on the visit covering all salient features of that plant/site/activity	

METHODIST COLLEGE OF ENGINEERING AND TECHNOLOGY					
DEPARTMENT OF CIVIL ENGINEERING					
Academic Year 2019-20					
B.E VII SEMESTER					
<u>S.no</u>	<u>Course Code</u>	<u>Course Title</u>	<u>CO No.</u>	<u>Course Outcome</u>	<u>Taxonomy level</u>
1	PC 801CE	Construction Management & Technology	CO1	Explain the objectives and Functions of Construction Management	Understanding
			CO2	Develop the time scheduling using PERT and CPM	Applying
			CO3	Analyze the cost time in network planning,	Analyzing
			CO4	Estimate The optimistic time for the completion of a Project.	Creating
			CO5	Classify types of contracts, List the advantages and disadvantages of types of contracts. Explain Tender forms documents etc, Understand project models – BOT, BOOT,PPP.	Understanding
			CO6	Develop linear program for optimization, Create graphical method linear programming in construction.	Creating
2	PE 821 CE	Retrofitting and Rehabilitation of Structures (RRS)	CO1	Explain the various definitions related to building repair and maintenance and describe the of maintenance works in buildings.	Understanding
			CO2	Describe and contrast the types of defects and damages in structures, according to their causes, and their preventive measures.	Understanding
			CO3	Describe and explain the various deterioration mechanisms in concrete and steel structures, including their causes and prevention.	Understanding
			CO4	Differentiate and summarize the various non-destructive tests and condition assessment procedures, and their specific applicability.	Understanding
			CO5	Discuss the various types of repair materials, compatibility considerations and techniques used in the repairs of structures.	Understanding
			CO6	Describe and explain the various retrofitting and rehabilitation procedures used for strengthening of damaged structures	Understanding
			CO1	Define the impacts of climate change on natural environment.	Remembering

3	PE 824 CE	Introduction to Climate Change	CO2	Explain the fundamentals of climate system and global water balance	Understanding
			CO3	Utilize the Knowledge of climate changes and its impact on Monsoon and Hydrology	Applying
			CO4	Take part in introduction of climate modelling especially using statistical downscaling techniques.	Analysing
			CO5	Select correction methods in climate science.	Applying
			CO6	Identify international initiatives which support countries to plan for climate change.	Applying
4	PE 833 CE	Groundwater Management	CO1	Describe the socio-economic aspects of ground water hydrology	Understanding
			CO2	Classify the organic, inorganic compounds in ground water	Understanding
			CO3	Identify the ground water contamination sources	Applying
			CO4	Make use of different flow equations to compute the flow from ground water aquifer	Applying
			CO5	Apply the prevention and control measures of sea water intrusions.	Applying
			CO6	Analyse various models in ground water and to apply them in the practical field problems.	Analysing
5	PE 834 CE	Intelligent Transportation Systems	CO1	Explain the concept of Intelligent Transportation Systems	Understanding
			CO2	Describe the concepts of system architecture and their evolution.	Understanding
			CO3	Explain the functional area of ITS	Understanding
			CO4	Explain impact of technology on different modes and movement	Understanding
			CO5	Discuss the capability of key technologies	Understanding
			CO6	Explain how to evaluate technologies, applications and services	Understanding
6	PE 842	Principles of Green Buildings	CO1	Explain the concepts of sustainability and a green buildings, along with its features and benefits.	Understanding
			CO2	Describe the criteria and methods used for site selection & planning and in achieving water efficiency in green buildings.	Understanding
			CO3	Define the terms and explain the methods used for achieving energy efficiency in green buildings.	Understanding

0	CE	Green Building Practices	CO4	Discuss the various types of building materials and waste management methods for a sustainable built environment.	Understanding
			CO5	Describe the methods used to maintain indoor environmental quality.	Understanding
			CO6	List and explain the various Green Building Rating systems applicable in India, and also the standard national and international codes related to green building practices.	Understanding
7	PE 844 CE	Traffic Engineering & Infrastructure Design	CO1	Classify the highway systems, gradients, intersections, road signs and markings	Understanding
			CO2	Solve the geometric design problems like superelevation, sight distance calculation, skid resistance, gradients, intersections etc.,	Applying
			CO3	Illustrate the characteristics and standards to be considered for designing a highway system	Understanding
			CO4	Demonstrate the applications of the infrastructural elements involved in highway infrastructure design	Understanding
			CO5	Explain the design guidelines of subways, foot over bridges, bus bays, cycle tracks and parking facilities	Understanding
			CO6	Explain the principles, objectives and requirements of highway safety elements like traffic islands and pedestrian facilities	Understanding
8	MC 901 EG	Gender Sensitization	CO1	Develop a better understanding of important issues related to gender in contemporary India.	Understanding
			CO2	change the basic dimensions of the biological. Sociological, psychological and legal aspects of gender through discussions, facts, everyday life, literature and film	Applying
			CO3	analyze how gender discrimination works in our society and how to counter it.	Analyzing
			CO4	identify and plan better ways of working and living together as equals.	Applying
			CO5	develop a sense of appreciation of women in all walks of life	Evaluating
			CO6	enable in developing good interpersonal relationships at work places and to develop a sustain interest in gender equality	Creating

9	PW 961 CE	Project Work – II	CO1	Summarize in written form the literature study carried out with relevant data analysis, interpretation and problem identification for the selected project topic.	Understanding
			CO2	Analyse the specific problem using engineering knowledge to arrive at a solution methodology	Analysing
			CO3	Formulate an investigation procedure and analyze, interpret and synthesise the obtained data using a laboratory procedure and/or modern engineering software and tools.	creating
			CO4	Draw valid conclusions and engineering solutions including design, recommendations or estimations, keeping in view the safety norms and regulations in codes of practice.	understanding
			CO5	Discuss and communicate in oral and written forms, the technical contents of the project, observing professional ethical principles of documentation.	understanding
			CO6	Demonstrate individual and teamwork skills in carrying out and managing the project work	applying
10	Mandatory Course	NSS	CO1	Create awareness about the community in which they work	
			CO2	Develop a sense of social and civic responsibility	
			CO3	Identify the needs and problems of the community and involve them in problem solving process	
			CO4	Utilize their knowledge in finding practical solution to individual and community problems	
			CO5	Practice national integration and social harmony	
			CO6	Acquire leadership qualities and democratic attitude	
			Average		