B.TECH

SEMESTER I	
EST 100 ENGINEERING MECHANICS	
CO1	Recall principles and theorems related to rigid body mechanics
CO2	Identify and describe the components of system of forces acting on the rigid body
CO3	Apply the conditions of equilibrium to various practical problems involving different force system.
CO4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.
CO5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses
SEMESTER II	
EST 120 BASICS OF CIVIL & MECHANICAL ENGINEERING	
CO 1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
CO 2	Explain different types of buildings, building components, building materials and building construction
CO 3	Describe the importance, objectives and principles of surveying.
CO4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
CO5	Discuss the Materials, energy systems, water management and environment for green buildings.
SEMESTER III	
CE201 MECHANICS OF SOLIDS	
CO 1	To understand the concept of simple stresses and strains and the various elastic constants
CO 2	The students will be able to solve the internal forces in members subject toaxial loads, shear, torsion and bending and plot their distributions.
CO 3	The students will be able to understand the theory of simple bending andanalyse the stress variations in composite materials.
CO4	The students will be able to analyse stress at a point and determine theprincipal and maximum shear stresses using equations as well as the Mohr'scircle.
CO5	The students will be able to analyse the deflection of statically determinatebeams.
CE203 FLUID MECHANICS	
CO 1	Understand the significance of basic principles of fluid statics and application of hydrostatic law
CO 2	Understand the principles of kinematics with specific emphasis on application of continuity equation, stream function, velocity potential function etc.
CO 3	Apply the principles of Bernoulli's equation in measurement of discharge in pipes, and in other pipe flow problems.
CO4	Apply the fundamental concepts in analysis of flow through different types of orifices, notches and weirs
CO5	Apply fundamental concepts of fluid mechanics in solving fluid flow problems in pipes, design of pipe, and analysis of pipe networks.
CO6	Understand basic principles of boundary layer theory and application of drag, lift on immersed bodies.
CE205ENGINEERING GEOLOGY	
CO 1	Students will be able to explain the relevance of engg geology in civil engineering
CO 2	Students will be able to classify the different weathering processes
CO 3	Students will be able to explain the concepts of surface water and its engineering significance
CO4	To interprete earthquakes in relation to internal structure of earth
CO5	To identify common rock forming minerals and common rocks based on their physical properties
CO 6	To identify the attitude of geological structures and instruments used
CO 7	To distinguish various natural hazards and its mitigation methods
CE207 SURVEYING	
CO 1	Apply principles of surveying
CO 2	Apply and choose the suitable method of leveling
CO 3	Understand the different methods of area and volume computation
CO4	Use triangulation methods for fixing the stations
CO5	Choose and apply the theory of errors
CO6	apply total station method and understanding the astronomical terms
CE231 CIVIL ENGINEERING DRAFT LAB	
CO 1	To introduce the fundamentals of Civil Engineering drawing.
CO 2	To understand the principles of planning
CO 3	To learn drafting of buildings.
CO 4	To impart knowledge on drafting software such as AutoCAD.
CE233 SURVEYING LAB	
CO 1	The students shall be able, to understand the concept of open traverse surveying and apply the same on the fields.
CO 2	the students shall be able to understand the concept of levelling and applied to find elevations of different points in the field by collimation method for rise and fall method
CO 3	the students shall be able to determine the angle by method of reiteration using theodolite
CO 4	the students shall be able to understand the meaning of slope distance, horizontal distance, and vertical height and its measurement using a total station instrument
CO 5	The students shall be able to use the method of coordinate for the measurement of area using a total station instrument
CO 6	the students shall be able to determine the angle by method of repeatition using theodolite
SEMESTER IV	
CE202 STRUCTURAL ANALYSIS I	
CO 1	Analyse trusses and study displacement response of statically determinate structural systems using energy method
CO 2	Analyse statically indeterminate structureS using unit load method and strain energy method
CO 3	Analyse statically indeterminate structures using strain energy method and method of consistent deformation
CO4	To know about moving loads and influence lines
CO5	know about Statically determinate and indeterminate cables and suspension bridges
CO6	know about Statically determinate arches
CE204 CONSTRUCTION TECHNOLOGY	
CO 1	To study details regarding properties and testing of building materials
CO 2	To study details regarding the construction of building components
CO 3	To study properties of concrete and concrete mix design
CO4	To impart the basic concepts in functional requirements of building and building services
CO5	To develop understanding about framed construction and building failures
CE206 FLUID MECHANICS	
CO 1	To study the Basic principles governing uniform fluid flow to open channel flow
CO 2	To study the Basic principles governing rapidly varied flow in open channel
CO 3	To study the Basic principles governing gradually varied flow in open channel flow
CO4	To understand basic modeling laws in fluid mechanics and dimensional analysis
CO5	To apply the fundamental theories of fluid mechanics for the analysis and design of hydraulic machines
CO6	To apply the fundamental theories of fluid mechanics for the analysis and design of hydraulic machines
CE208 GEOTECHNICAL ENGINEERING I	
CO 1	To impart to the fundamentals of Soil Mechanics principles;
CO 2	To provide knowledge about the basic engineering properties of soils
CO 3	To provide knowledge about the index engineering properties of soils
CO4	Understand the basic principles governing soil behavior.
CO5	Understand the procedure, applicability and limitations of various soil testing methods
CE232 MATERIAL TESTING LAB	
CO 1	To undertake the testing of materials when subjected to tensile loading
CO 2	To understand the behavior of materials subjected to impact loading
SEMESTER V	
CE301 DESIGN OF CONCRETE STRUCTURES I	
CO 1	Apply the fundamental concepts of limit state method
CO 2	Use IS code of practice for the design of concrete elements
CO 3	Understand the structural behavior of reinforced concrete elements in bending, shear, compression and torsion.
CO4	Design beams, slab, stairs, columns and draw the reinforcement details
CO5	Analyze and design for deflection and crack control of reinforced concrete members
CE 303 STRUCTURAL ANALYSIS II	
CO 1	analyse structures using force method
CO 2	analyse structures using displacement method
CO 3	analyse curved beams in plan
CO4	analyse structures using plastic theory

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CE 305 GEOTECHNICAL ENGINEERING - II	
CO 1	Calculate the stresses in soil due to loaded areas.
CO 2	Differentiate active and passive earth pressuresand compute the earth pressure on retaining walls.
CO 3	Evaluate the bearing capacity of soil and compute the settlement.
CO4	Compare the rectangular and trapezoidal combined footings.
CO5	Compare the rectangular and trapezoidal combined footings.
CO6	Analyse various subsoil investigation procedures.
CO7	Make use of the fundamentals of dynamics and oscillations to understand the concept of machine foundations.
CE 307 GEOMATICS	
CO 1	Apply the different methods traversing, balancing the traverse
CO 2	Apply the advanced methods in curve surveying
CO 3	Understand recent advanced techniques such as GPS
CO4	Understand basic principles of remote sensing
CO5	Understand basic principles of GIS and GIS operations
CE309 WATER RESOURCE ENGINEERING	
CO 1	To impart knowledge regarding the availability of water on hydrosphere, its distribution and quantification
CO 2	To convey the knowledge on the scientific methods for computing irrigation water requirements
CO 3	To communicate fundamental knowledge on reservoir engineering and river engineering
CO4	To impart knowledge regarding the movement and distribution of water below earth surface
CE 369 DISASTER MANAGEMENT (Elective)	
CO 1	To understand the concepts of disaster management
CO 2	To get general ideas about the processes involved in natural and anthropogenic disasters
CO 3	To understand the concepts of disaster management and measures to mitigate and contain common episodes of disaster
CE 371 ENVIRONMENTAL POLLUTION (Elective)	
CO 1	Recall the basic knowledge about environment and ecosystem
CO 2	Recall and describe pollution and pollutants
CO 3	Identify and describe the major air pollutants, sources and effects
CO4	Identify and describe the major water pollutants, sources and effects
CO5	Identify and describe solid waste and the major soil pollutants, sources and effects
CO6	Identify and describe noise pollutantion, sources and effects
CE309 WATER RESOURCE ENGINEERING	
CO 1	To impart knowledge regarding the availability of water on hydrosphere, its distribution and quantification
CO 2	To convey the knowledge on the scientific methods for computing irrigation water requirements
CO 3	To communicate fundamental knowledge on reservoir engineering
CO4	To Estimate the storage capacity of reservoirs and their useful life
CO5	To Know the features of various river training works
CO6	To Compute the yield of aquifers and wells.
CE 341 DESIGN PROJECT	
CO 1	To understand the engineering aspects of design with reference to simple products
CO 2	To foster innovation in design of products, processes or systems
CO4	To develop design that add value to products and solve technical
CE 331MATERIAL TESTING LAB	
CO 1	To enable experimental evaluation of properties of the materials used for concrete
CO 2	To obtain the characteristics of the materials.
CE 333 GEOTECHNICAL ENGINEERING LAB	
CO 1	To compute the index properties of soil by different laboratory experiments.
CO 2	To draw the particle size distribution curve of different types of soils and classify the soils as per the result.
CO 3	To know how to calculate the optimum moisture content and maximum dry density using Standard Proctor Test.
CO4	To determine field density using sand replacement and core cutter methods, and compare the results.
CO5	To compute the co-efficient of permeability through different types of soils by constant head and falling head methods.
CO6	To calculate the shear strength of soil, and shear parameters from different laboratory tests like Vane shear test, Direct shear test and Unconfined compression test.
CO7	To know the difference between consolidation and compaction, also to calculate co-efficients related to compressibilty and consolidation by different methods.
	SEMESTER VI
CE 302 DESIGN OF HYDRAULIC STRUCTURES	
CO 1	To impart knowledge regarding the design of the various minor irrigation structures
CO 2	To convey the knowledge on the causes of failure, design criteria and stability analysis of different types of dams
CO 3	To impart knowledge regarding the design of various hydraulic structures
CO4	To convey the knowledge on the causes of failure, design criteria and stability analysis of gravity dam
CO5	To convey the knowledge on the causes of failure and design criteria of arch and earthern dam
CE 304 DESIGN OF CONCRETE STRUCTURES II	
CO 1	Design eccentrically loaded and slender columns using SP 16 design charts and different types of foundations
CO 2	Design different types of foundations
CO 3	Design and detail cantilever retaining wall and understand the design principles of Counter fort retaining wall
CO4	Design and detail circular slabs and domes
CO5	Design rectangular and circular water tanks using IS code coefficients (IS 3370).
CO6	Gain knowledge of prestressed concrete fundamentals and analyse pre and post tensioned beams.
CE306 COMPUTER PROGRAMMING AND COMPUTATIONAL TECHNIC	
CO 1	To attain basic concept about C++, data types and selection statement.
CO 2	To provide adequate knowledge for coding in C ++ using looping statements and arrays
CO 3	To have a basic idea about functions and variables
CO4	To provide knowledge about structure and class in C++ coding
CO5	To give awareness about transidental equations and their implementation to analyse basic engineering problem
CO 6	To give awareness about functional approximation and linear algebric equation and their implementation to analyse basic engineering problem
CE 308 TRANSPORTATION ENGINEERING I	
CO 1	To introduce the principles and practice of Highway Engineering
CO 2	To enable students to have a strong analytical and practical knowledge of geometric design of highways.
CO 3	To introduce pavement design concepts, material properties, construction methods and to design highway pavements.
CO4	To understand the principles of traffic engineering and apply this for efficient management of transportation facilities
CO5	To introduce the principles Airport Engineering.
HS 300 PRINCIPLES OF MANAGEMENT	
CO 1	To develop ability to critically analyse and evaluate a variety of management practices in the contemporary context
CO 2	To understand and apply a variety of management and organisational theories in practice
CO 3	To be able to mirror existing practices or to generate their own innovative management competencies, required for today's complex and global workplace
CO4	To be able to critically reflect on ethical theories and social responsibility ideologies to create sustainable organisations
CE362 GROUND IMPROVEMENT TECHNIQUES (Elective)	
CO 1	To understand about the types of ground Improvement Techniques and soil distribution of India
CO 2	To attain knowledge about various types of grouts and their applications
CO 3	To attain knowledge about types of chemical stabilisation and their construction method
CO4	To understand about ground anchors, rock bolts, and soil nailing
CO5	To attain knowledge about compaction of soil
CO 6	To understand about various methods of dewatering of soil
CE 366 TRAFFIC ENGINEERING AND MANAGEMENT (Elective)	
CO 1	Outline the basic concept of traffic management.
CO 2	Outline the basic concepts of traffic regulations.
CO 3	Determine highway capacity
CO4	Design intersections and traffic signals.
CO5	Understand traffic safety measures.
CO6	Explain theories of traffic flow.

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CE 332 TRANSPORTATION ENGINEERING LAB	
CO 1	To enable the students to conduct different tests to find various properties of aggregates, bitumen and soil subgrade
CO 2	To assess the suitability of pavement materials in construction
CO 3	To assess the knowledge of the student about the various materials in pavement construction
CE334 COMPUTER AIDED CIVIL ENGINEERING LAB	
CO 1	To introduce the fundamentals of Civil Engineering drafting and drawing
CO 2	To familiarize with theStaad software packages for analysis and Design of structures
CE 352 COMPREHENSIVE EXAM	
CO 1	To access the comprehensive knowledge gained in basic courses relevant to the branch of study
CO 2	To comprehend the questions asked and answer them with confidence
	SEMESTER VII
CE401 DESIGN OF STEEL STRUCTURES	
CO 1	Identify and compute the design loads and load combinations of steel structures and suitable connection between members
CO 2	Select the most suitable section for tension members
CO 3	Choose appropriate column and foundation types involving different force systems
CO4	Identify and select beam sections suitable for buildings and bridges
CO5	Apply relevant codal provisions to design appropriate roof trusses for buildings
CO6	Solve the stresses, deflections and design different structural members made of timber and composites
CE403 STRUCTRAL ANALYSIS III	
CO 1	Analyse structures using approximate methods
CO 2	Analyse trusses, continuous beams, rigid frames using flexibility method
CO 3	Analyse trusses, continuous beams, rigid frames using stiffness method metho
CO4	conceive Finite element procedures by direct stiffness method
CO5	use basics of structural dynamics and analyse the response of SDOF System
CE405 ENVIRONMENTAL ENGINEERING - I	
CO 1	Identify and compute the difference sources of water and quantity according to population.
CO 2	To identify the factors affecting the quality of water
CO 3	To recognize the different treatment plant design
CO4	To analyze the different distribution network
CE407 TRANSPORTATION ENGINEERING -II	
CO 1	The students will be able to explain the geometric parameters of a railway track
CO 2	The students will be able to compare different modes of transportation
CO 3	The students will be able to design a turnout
CO4	The students will be able to describe various safety issues in railway engineering
CO5	The students will be able to describe various tunnel driving procedures
CO 6	The students will be able to explain various navigational aids
CO 7	The students will be able to explain the functions of docks
CE409 QUNTITY SURVEYING AND VALUATION	
CO 1	To have an awareness regarding specifications, analysis of rates, valuation etc. in connection with construction
CO 2	To prepare detailed estimates, bar bending schedules of various items of work
CE469 ENVIRONMENTAL IMPACT ASSESSMENT(elective)	
CO 1	Recall the basic knowledge about environment and EIA
CO 2	Recall and describe air pollution and water pollution
CO 3	Describe solid waste and noise pollution
CO4	Identify and describe climate change
CO5	Analysis of EIA
CO6	Analysis of quality of air, water and noise
CE451 SEMINAR AND PROJECT PRELIMINARY	
CO 1	To develop skills in doing literature survey.
CO 2	To develop skills in technical presentation.
CO 3	To develop skills in report preparation.
CO4	To enable project identification and execution of preliminary works on final semester project
CE431 ENVIRONMENTAL ENGINEERING LAB	
CO 1	To assess quality of water for various purposes
CO 2	To analyse different characteristics of wastewater samples
	SEMESTER VIII
CE402 ENVIRONMENTAL ENGINEERING II	
CO 1	To understand various sources and characteristics of wastewater
CO 2	To design sewers for partial and full flow conditions
CO 3	To understand various types of treatment methods for wastewater
CO4	To know the design aspects of various treatment units in wastewater treatment pla
CO5	To understand the sludge treatment and disposal methods
CE404 CIVIL ENGINEERING PROJECT MANAGEMENT	
CO 1	To impart knowledge on principle of planning and scheduling projects with emphasis on construction
CO 2	To understand the suitability of various construction equipment and its codification also the optimization of cost
CO 3	To Study the legal and ethical issues related to construction projects
CO4	To impart knowledge in principles of safe construction practices
CO5	To understand the need of ethical considerations in constructions
CO6	To the became familiar with the TQM and concepts related to construction
CE474 MUNICIPAL SOLID WASTE MANAGEMENT (elective)	
CO 1	To understand different types and sources of waste
CO 2	To apply the characteristics of waste in analysing the solid waste management
CO 3	To enable studentsto understsnt the ill effects of increasing solid wastes
CO4	To understand the various methods available for managing solid wastes generated
CE492 PROJECT	
CO 1	To develop creative thinking in finding viable solutions to engineering problems
CO 2	To think innovatively on the development of components, products, processes or technologies in the engineering field
CO 3	To apply knowledge gained in solving real life engineering problems
CO4	To develop skills in doing literature survey, technical presentation and report preparation

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