CSMSS

Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Chhatrapati Sambhajinagar 431 011
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Department of Civil Engineering

A.Y.	Semester	Code of Subject	Name of Subject	CO NO.	CO
2023-24	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 Laplce & 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
		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.

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			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.
	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
	BTCVC304	Hydraulics -I	1	Students will be able to analyze fluid properties.
			2	Students will be able to analyze the principles of flow measurement.
			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
	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.

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				6	Students will be able to describe Layout Of Structure
		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.
		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
2023-24	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
		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.

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				2	Students will be able to explain the principles and processes involved in water treatment, including aeration, sedimentation, and disinfection.
				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.
		BTCVC403	Structural Mechanics - I	1	Students will be able to calculate slope and deflection in determinate beams.
				2	students will be able to execute application of stained 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
		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

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				5	Students will be able to analyze hydrological processes, such as rainfall, runoff, and infiltration
		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 application of momentum principle of impact of jets on plane and the characteristics of hydraulic jump.
				4	Students will be able to explain the turbines working principle.
				5	Students will be able to summarize with the construction and working of pumps.
		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.
				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
2023-24	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
				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
		BTCVC502	Geotechnical Engineering	1	Students will be able to classify different soil properties and behavior

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				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 compresibility parameters to design different structures
		BTCVC503	Structural Mechanics –II	1	Students will be able to calculate the forces in each and every member of truss and horizontal or vertical displacement of a joint by the analysis of determinate and indeterminate trusses by strain energy method with and without considering the effect of settle
				2	Students will be able to analyse the different types of moving loads i.e., single concentrated load, several concentrated loads and uniformly distributed load with the help of Influence line diagram (ILD)
				3	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)
				4	Students will be able to analyse the indeterminate structures by direct flexibility method
				5	Students will be able to analyse the indeterminate structures by direct stiffness method
				6	Students will be able to analyse the indeterminate structures by Finite Element Method
		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.

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				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.
		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.
		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.

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		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 software's 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 developed the concrete mix design in MS excel
		BTCVL509	Geotechnical Engineering Lab.	1	Student will be able to examine the grain size distribution of soil
				2	Student will be able to determine 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
2023-24	VI	BTCVC601	Design of RC Structures	1	Students will be able to discuss various design philosophies for design of Reinforced Concrete Structures
				2	Students will be able to analyze and design reinforced concrete structural elements like singly and doubly reinforced sections, Columns and column footings using or king stress method.
				3	Students will be able to explain limit state design approach and analyze and design reinforced concrete structural elements for shear and bond using limit state method.
				4	Students will be able to analyze and design beams and slabs using limit state method.
				5	Students will be able to analyze and design colums and footing using limit state method.

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		BTCVC602	Foundation Engineering	1	Students will able to predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries.
				2	Students will able to explain the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability.
				3	Students will able to interpret the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters.
				4	student will able to apply geotechnical engineering theories to foundation design
				5	Students will able to analyze the stability of slope by theoretical and graphical methods.
		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	Students 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
		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.

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		Applications of Remote Sensing and Geographic Information Systems	1	Students will able to memorize demonstrating of earth resources management using remote sensing
	BTCVOE605		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
			5	Students will able to explain the concept of Map projections and apply the techniques of remote sensing and GIS to required field
	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 analyses the decentralization of powers between central, state and local self-government.
	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.

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					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.
2023-24	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 identify 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 neccesity and procedure to perform an audit of an structure
		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.
		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

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				measures to real-world scenarios involving diaphragm walls and disaster management
	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.
			5	Students will be able to assess the factors affecting property valuation, and apply various methods to determine property value, considering depreciation and obsolescence.
	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
	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.

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				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.
		BTHM707A	Essence of Indian Traditional Knowledge	1	Students will be able to describe ancient and mediable Indian culture
				2	Students will 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.
2022-23	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.
		BTCESS802A	Energy Efficiency Acoustics and Daylighting 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

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						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 day lighting design principles to optimize indoor environmental quality.