

Shivaji University, Kolhapur

Department of Technology

Vision

To be a leader in engineering and technology education, a research centre of global standards to provide valuable resources for industry and society through development of competent technical human resources.

Mission

1. To develop technocrats of national & international stature committed to the task of nation building.
2. To organize teaching learning programs to facilitate the development of competent and committed professionals for practice, research and academics.
3. To undertake collaborative research projects that offer opportunities for consistent interaction with industries.

Name of Programme: B.Tech. (Civil Engineering)

Program Outcomes

1. Apply basic knowledge of science, mathematics and engineering to solve complex Civil Engineering problems.
2. Analyze complex Civil Engineering problems to arrive at appropriate solutions using the fundamentals of science and engineering
3. Design and develop safe and environmental friendly systems and their components to meet specific needs
4. Design and conduct experiments for complex Civil Engineering problems to come out with valid conclusions
5. Select and apply appropriate techniques and state of the art tools for accomplishing complex Civil Engineering activities
6. Assess societal, cultural and legal issues and consequent responsibilities pertaining to Civil Engineering practice
7. Understand the impact of Civil Engineering projects on the environment and the need for sustainable development
8. Practice professional ethics while discharging the responsibilities
9. Work in a team as a member or as a leader in diverse professional environments.
10. Comprehend and communicate effectively complex Civil Engineering activities through presentations and reports.
11. Understand financial aspect and apply management principles to civil engineering projects.
12. Engage in independent and lifelong learning in the context of rapid technological changes.

Program Specific Outcomes		
<p>1. Able to perform economic analysis, quality checks, time/labour management and cost estimates related to design, construction, operations and maintenance of systems in the civil technical specialties.</p> <p>2. Able to plan and prepare design and construction documents, such as specifications, contracts, change orders, engineering drawings, and construction schedules.</p>		
Course Outcomes		
Part-I Semester-I		
67895	Engineering Mathematics-I	<ol style="list-style-type: none"> 1. Students in this course will apply the Procedure and methods to solve technical problems. 2. Student can understand how to model real world scenario using Mathematics 3. Students will be able to solve computational problems using Scilab/Matlab.
67896-67942	Engineering Physics	<ol style="list-style-type: none"> 1. The student would be able to apply the concepts of physics in various branches of engineering 2 The student would be able to use the techniques, skills, and modern tools necessary for physics and engineering careers 3. Understands and apply the concepts of light in optical fibers, light wave communication systems, holography. 4. Use lasers as light sources for low and high energy applications. 5. Understand the nature and characteristics of ultrasonic waves and its various engineering applications.
67897-67943	Engineering Mechanics	<ol style="list-style-type: none"> 1. Differentiate between Scalar and Vector Quantities 2. Understand the characteristics of force, system of forces , learn to resolve forces. 3. Understand the moment and couple of forces and effect of moment on rigid body 4. Compute resultant of coplanar concurrent and non-concurrent force system. 5. Distinguish between C.G. and Centroid, Compute moment of inertia of plane figures and composite figures. 6. Understand and analyze beam as a structure and compute support reactions using Lami's theorem & equilibrium Conditions for concurrent, parallel and general force system. 7. Understand Truss as a structural member and analyze plane trusses by the method of joints And sections 8. Understand the concept of dynamic as applied to particle.

		<p>9. Introduce & define Kinematics of Rigid body, get idea about translation, rotation, general Plane motion</p> <p>10. To Know principle of work.</p>
67899-67945	Electronic Component Devices	<ol style="list-style-type: none"> 1. Understand the basics of Electronics component, different materials and their applications. 2. Understand the construction, V-I characteristics and application of semiconductor devices 3. Analyze different electronic circuits based on diode, transistor and SCR 4. Explain the working principle, construction, applications of relays, display devices and transducer. 5. Test and verify results of diode and BJT circuits
67898-67944	Fundamentals of Mechanical Engineering	<ol style="list-style-type: none"> 1. Recall the terms, basic concepts and laws of thermodynamics. 2. Explain the working of various mechanical systems like I.C. Engines, Refrigeration and air conditioning systems, power plants, energy conversion devices and power transmission devices. 3. Explain various types of manufacturing processes. 4. Explain heat and mass transfer and its modes of transfer. 5. Analyze power transmission devices with their functions.
67900-67946	Lab-I Engineering Physics	<ol style="list-style-type: none"> 1. The student would be able to use spectrometer, polar meter, LASER, photodiode for various measurements. 2. Test optical components using principles of interference and diffraction of light 3. Determine the width of narrow slits, spacing between close rulings using lasers and appreciate the accuracy in measurements. 4. Use ultrasonic interferometer for measuring velocity of ultrasound in various liquids.
67901-67947	Lab.-II Engineering Mechanics	<p>After successful completion of this course, the student will be able to:</p> <ol style="list-style-type: none"> 1. Verify and correlate law of polygon of forces. 2. Verify Lami's theorem. 3. Verify Equilibrium conditions. 4. Determine coefficient of friction for two sliding surfaces. 5. Verify Law of Moments. 6. Find value of local gravitational acceleration.

67902-67948	Lab.–III Fundamentals of Mechanical Engineering	<ol style="list-style-type: none"> 1. Explain and demonstrate the working of various mechanical systems like I.C.Engines, Refrigeration and air conditioning systems, power plants and steam generators. 2. Explain and demonstrate the construction and working of mechanical power transmission devices. 3. Explain and demonstrate the construction and working of energy conversion devices. 4. Explain and demonstrate the manufacturing processes.
67903-67949	Lab.–IV Electronic Components of Devices	<ol style="list-style-type: none"> 1. Understand the diode and transistor characteristics. 2. Verify the rectifier circuits using diodes and filter circuits. 3. Design various amplifiers like CE, CC, common source amplifiers 4. Study experimentally the characteristics of SCR and JFET
67904-67950	Lab-V Professional Communication	<ol style="list-style-type: none"> 1. Students will be able to communicate language effectively. 2. Students learn to use grammar rules in spoken and written English. 3. Students will be able to learn personality traits and soft skills. 4. Students acquire required skills for technical writings. 5. Students learn fluency and pronunciation. 6. Students acquire techniques for presentation skills.
67905-67951	Lab- VI Matlab & Scilab	<ol style="list-style-type: none"> 1. To familiarize the student in introducing and exploring MATLAB & SCILAB software's. 2. Understand the main features of the MATLAB and SCILAB 3. To enable the student on how to approach for solving Engineering Mathematics problems using MATLAB and SCILAB. 4. To solve complicated numerical problems by writing MATLAB and SCILAB programs 5. Interpret and visualize simple mathematical functions and operations using MATLAB and SCILAB.
Part-I Semester-II		
67931	Engineering Mathematic-II	<ol style="list-style-type: none"> 1. Students in this course will apply the Procedure and methods to solve technical problems 2. Student can understand how to model real world scenario using Mathematics. 3. Students will be able to solve computational

		problems using Scilab/Matlab.
67932-67906	Engineering Chemistry	<p>After successful completion of this course, the student will able to:</p> <ol style="list-style-type: none"> 1 Have knowledge of water quality parameters and water softening processes, and calculate hardness of water. 2 Classify and describe properties and applications of engineering material. 3 Explain mechanism and properties of lubricants and select lubricants for different service conditions. 4 Understand the mechanism and control methods of corrosion and apply their knowledge for protection of different metals from corrosion. 5 Use instrumental methods for the analysis of material.
67933-67907	Fundamental Of Civil Engineering	<ol style="list-style-type: none"> 1. Understand how civil engineering is related to other branches. 2. Find out linear and angular measurements required to prepare a plan or map by using traditional as well as modern instruments. 3. Find out vertical distances, reduced levels and angles by using total station. 4. Calculate area of irregular surface by using Mechanical and Digital Planimeter. 5. Identify building materials required for construction with current market rates. 6. Understand use, necessity of submission and working drawing. 7. Prepare site visit report.
67935-67909	Fundamental Of Electrical Engineering	<ol style="list-style-type: none"> 1. Develop fundamental understanding about basics of DC and AC circuit . 2. Differentiate between electrical and magnetic circuit. 3. Explain the working principle, construction, applications of DC machines and AC machines. 4. Understand electrical power system, wiring and Ear thing . 5. Apply different circuit laws to solve electrical circuits and verify results experimentally .
67934-67908	Engineering Graphics	<ol style="list-style-type: none"> 1. Identify basic concepts of BIS conventions and their application. 2. Interpret first angle and third angle projection system. 3. Construct orthographic projections of points, lines and planes. 4. Apply principles of projection and construct orthographic and isometric views of an object.

		5. Develop a skill of visualization to understand and read the drawing.
67936-67910	Lab-I Engineering Chemistry	<ol style="list-style-type: none"> 1 Apply basic concepts of chemistry for analysis. 2 Determine the various water quality parameters and preparation of polymers 3 Determine the viscosity of liquid 4 Estimate the amount of copper and zinc from brass solution 5 Understand the use of instrumental methods for analysis of the material
67937-67911	Lab-II Fundamental of Civil Engineering	<p>After successful completion of this course, the student will able to:</p> <ol style="list-style-type: none"> 1. Understand how civil engineering is related to other branches. 2. Find out linear and angular measurements required to prepare a plan or map by using traditional as well as modern instruments. 3. Find out vertical distances, reduced levels and angles by using total station. 4. Calculate area of irregular surface by using Mechanical and Digital Planimeter. 5. Identify building materials required for construction with current market rates. 6. Understand use, necessity of submission and working drawing. 7. Prepare site visit report.
67938-67912	Lab. -III Engineering Graphics	<ol style="list-style-type: none"> 1. Identify and implement basic concepts of BIS conventions to sketch Engineering drawing. 2. Create geometric constructions with hand tools. 3. Construct orthographic projection and sectional view of a machine part. 4. Create isometric projection from multiview drawings of an object. 5. Sketch projection of solids and development of lateral surfaces of solids.
67939-67913	Lab.- IV Fundamental Of Electrical Engineering	<p>After completing this course the student will be able</p> <ol style="list-style-type: none"> 1) Perform and measure the basic electric circuit experiment with knowledge of fundamental laws 2) Demonstrate behavior of R,L, C,AC circuit. 3) Understand use of various electrical measuring instruments. 4) Understand application of DC machines and testing of single phase transformer.
67940-67914	Lab.-V Workshop Practice	<ol style="list-style-type: none"> 1. Execute safety measures, while working in a workshop. 2. Identify and use of various hand tools and measuring instruments.

		<ol style="list-style-type: none"> 3. Demonstrate and use of different fitting tools and prepare a fitting job as per given drawing. 4. Demonstrate and use of different Carpentry tools and prepare a wooden job as per given drawing. 5. Perform Arc welding operation to prepare a welding joint.
67941-67915	Lab.-VI Computer Programming	<ol style="list-style-type: none"> 1. Illustrate the flowchart and design of an algorithm for a given problem and to develop C programs using operators. 2. Develop conditional and iterative statements to write C programs. 3. Design C programs with the use of Pointers to access arrays, strings and functions. 4. Exercise user defined data types including structures and unions to solve problems. 5. Design C programs using pointers and to allocate memory using dynamic memory management. 6. Demonstrate files concept to show input and output of files in C.
Part-II Semester-III		
Course code MA 211	Course title Engineering Mathematics-III	<ol style="list-style-type: none"> 1. Solve Linear Differential Equations and Apply them to realistic problems. 2. Solve Partial Differential Equations for solving problems in Civil Engineering. 3. Understand Application of Fourier series and Probability in Civil Engineering 4. Apply knowledge of Vector Calculus to solve engineering problems.
Course code CE 211	Course title Surveying	<ol style="list-style-type: none"> 1. Explain the permanent adjustments required for levelling instruments, errors and correction in levelling and characteristics of ground. 2. Compute areas and volumes on the basis of field observation by using appropriate method. 3. Explain and describe the principle, instruments used and methods, significance of plane table surveying 4. Use Theodolite for traverse survey and for calculations of elevations by using Trigonometric Levelling 5. Plan a survey for applications such as road alignment and set out the curves. 6. Apply knowledge of tacheometry in the preparation of plan in which horizontal and vertical control is required 7. Apply modern surveying instrument such as Total Station for Engineering Problem. 8. Explain the use of modern surveying technique Remote Sensing

		,GIS, GPS, Photogrammetry in the field of surveying.
Course code CE 212	Course title Strength of Materials	<ol style="list-style-type: none"> 1. Understand the mechanical properties of materials for external actions. 2. Determine stress and strain in axially loaded homogenous and compound bars. 3. Draw SFD & BMD for the given beam 4. Analyze circular shafts & thin walled cylinders. 5. Determine bending stress distribution for given beams. 6. Determine shear stress distribution for given beams. 7. Understand axial and Bi-axial stress distribution in columns. 8. Determine slope and deflection in determinant beams
Course code CE 213	Course title Building Construction	<ol style="list-style-type: none"> 1. Develop the ability and apply the techniques of construction in the design of buildings. 2. Explain Types of foundation, basic component parts of building and their requirements. 3. Develop awareness of low cost housing & green building and new construction techniques 4. Illustrate the Details of brick bond, masonry work, and properties of cement. 5. Categorize Arches and Explain design consideration with technical terms. 6. Explain windows, doors, stairs, lintel as well as roof and roof coverings also flooring materials
Course code CE 214	Course title Fluid Mechanics-I	<ol style="list-style-type: none"> 1. Student will be able to understand the processes and science of fluids. 2. Student will study the basic properties of fluids and their behavior under application of various force systems. 3. Student will discuss the basic concept and principles in fluid statics, fluid kinematics and fluid dynamics with their applications in fluid flow problems. 4. Student will be able to identify and obtain values of fluid properties and relationship between them 5. Student will be able to understand the principles of continuity, momentum and energy as applied to fluid in motion.
Part-II Semester-IV		
Course code CE 221	Course title Theory of Structures-I	<ol style="list-style-type: none"> 1. Understand the Classification of structure based on structural forms. 2. Determine Static and Kinematic degree of indeterminacy (degrees of freedom) of Structures. 3. Determine Slope and deflection of beam by Conjugate Beam Method. 4. Understand concept of strain energy.

		<p>5. Determine deflection of determinate structures – beams, and rectangular portals.</p> <p>6. Analysis of indeterminate structures Beams and Rectangular portal frames by using Castigliano’s Theorem.</p> <p>7. Determine deflections of Determinate Trusses by using Castigliano’s Theorem.</p> <p>8. Determine displacements of Indeterminate Beams by Compatibility Methods, Maxwell’s theorem of reciprocal and Bett’s law</p> <p>9. Analysis of Redundant Trusses by Castigliano’s Theorem.</p> <p>10. Analysis of indeterminate Structures by Displacement Methods of slope deflection and moment distribution method with indeterminacy up to 3 degrees.</p> <p>11. Understand Basic Concept of Influence lines.</p> <p>12. Construction of Influence line diagrams for support reactions, SF and BM at a given section.</p>
Course code CE 222	Course title Engineering Geology	<p>1. Student will generate global vision of Earth processes and identify the subsurface material</p> <p>2. Student will know reasons of phenomena like Earthquakes and Tsunamis.</p> <p>3. Student will know about groundwater availability zones and groundwater management.</p> <p>4. Student will know megascopic and mechanical properties of rocks.</p> <p>5. Student will know field procedures of subsurface explorations and generate subsurface profiles and map structures.</p> <p>6. Student will know considerations for site selection for engineering projects</p>
Course code CE 223	Course title Fluid Mechanics-II	<p>1. Explain the concept of Open channel flow</p> <p>2. Demonstrate application of gradually varied flow</p> <p>3. Explain concept of rapidly varied flow & hydraulic jump</p> <p>4. Explain and apply application of notches and weir to measure the rate of flow</p> <p>5. Explain importance of impact of jet on various shapes of plate</p> <p>6. Demonstrate application of various types of turbines</p> <p>7. Demonstrate and explain concept of centrifugal pump and reciprocating pump</p> <p>8. Explain and apply boundary layer theory</p>
Course code CE 224	Course title Concrete Technology	<p>1. Identify the functional role of ingredients of concrete and apply this knowledge to mix design philosophy</p> <p>2. Acquire and apply fundamental knowledge in the fresh properties of concrete</p>

		<p>3. Acquire and use appropriate admixtures in concrete</p> <p>4. Acquire and apply fundamental knowledge in the hardened properties of concrete</p> <p>5. Design a concrete mix which fulfills the required properties for fresh and hardened concrete</p> <p>6. Develop an awareness of the utilization of waste materials as novel innovative materials for use in concrete and to get acquainted with recent developments in the field of Concrete Technology</p>
<p>Course code</p> <p>CE 225</p>	<p>Course title</p> <p>Building Planning and Design</p>	<p>1. develop the ability and apply the principles of planning in the design of residential buildings</p> <p>2. explain the importance and application of regulations such as building bye laws and codal provisions</p> <p>3. develop awareness of low cost housing & green building</p> <p>4. draw plumbing system, air conditioning system, electrification system, ventilation</p> <p>5. explain paint component, information about building finishing like plastering, pointing, dado, POP, wall paper.</p>
<p>Part-III</p> <p>Semester-V</p>		
<p>Course code</p> <p>CE 311</p>	<p>Course title</p> <p>Design of Steel Structures</p>	<p>1. Understand the use of IS Codes related to structural design of steel structures</p> <p>2. Understand the concept of limit state method</p> <p>3. Design of bolted and welded connections</p> <p>4. Design of tension and compression members of steel structures, columns and column bases</p> <p>5. Design of beam and plate girder</p> <p>6. Prepare detailed structural drawings of a steel structure</p>
<p>Course code</p> <p>CE 312</p>	<p>Course title</p> <p>Transportation Engineering-I</p>	<p>1. Understand concepts and planning of highway engineering and highway safety.</p> <p>2. Understand the concepts and analysis of highway geometric design.</p> <p>3. Understand the principles and design of rigid and flexible pavements.</p> <p>4. Decide the selection of a bridge structures; list the factors affecting, design of a various parameters of bridge structures.</p> <p>5. Design and plan airport, runways terminals buildings, hangers and aprons</p>
<p>Course code</p> <p>CE 313</p>	<p>Course title</p> <p>Geotechnical Engineering-I</p>	<p>1. Understand properties of Soil and its classification.</p> <p>2. Understand the concepts and analysis of permeability and seepage in soil.</p> <p>3. Understand the concept of Compaction and field control of compaction to enhance the strength of soil.</p>

		<p>3. Study the shear strength parameters and method to calculate shear strength of soil.</p> <p>4. Evaluate and understand the pressure distribution in soil.</p> <p>5. Evaluate earth pressures and apply to check external stability of retaining structures</p>
<p>Course code CE 314</p>	<p>Course title Environmental Engineering-I</p>	<p>1. To get knowledge of air and noise pollution</p> <p>2. To make the students familiar with sources and its demand of water.</p> <p>3. To understand the basic characteristics of water and its determination.</p> <p>4. To expose the students to understand the design of water supply lines.</p> <p>5. To provide adequate knowledge about the water treatment processes and its design.</p> <p>6. To have adequate knowledge on operation and maintenance of water supply and leakage Detection and Prevention.</p>
<p>Course code CE 315</p>	<p>Course title Construction Management</p>	<p>1. Understand concepts and planning engineering management.</p> <p>2. Understand the concepts and analysis of resource management on site.</p> <p>3. Understand the financial concepts relating to construction industry.</p> <p>4. Understand the importance of safety on site</p>
<p>Part-III semester-VI</p>		
<p>Course code CE 321</p>	<p>Course title Theory of Structures-II</p>	<p>1. Analyze indeterminate structures using Classical methods.</p> <p>2. Determine unknown forces of indeterminate structures using Flexibility Method.</p> <p>3. Compute unknown displacements of indeterminate structures using Stiffness Method.</p> <p>4. Develop Influence Line Diagram for determinate and indeterminate structures.</p> <p>5. Demonstrate the behavior of arches and their methods of analysis.</p> <p>6. Analyzemultistory frames subjected to gravity loads and lateral loads</p>
<p>Course code CE 322</p>	<p>Course title Water Resources Engineering –I</p>	<p>1. Apply the knowledge of estimation of hydro meteorological parameters.</p> <p>2. Design of efficient hydraulic structures.</p> <p>3. To develop different methods of efficient irrigation and water conservation.</p> <p>4. To develop the methods of consumptive use of surface water and groundwater</p>
<p>Course code CE 323</p>	<p>Course title Transportation Engineering-II</p>	<p>1. Apply basics of railway engineering, its components and geometric design.</p> <p>2. Signalling and interlocking in railway engineering, construction and maintenance of railway track and modern trends in railways.</p>

		<p>3. To Understand principles and basics of tunnel engineering.</p> <p>4. To Understand principles and basics of dock and harbor engineering.</p>
Course code CE 324	Course title Environmental Engineering-II	<p>1 Explain sources, characteristics and collection system of wastewater.</p> <p>2 Design the various treatment processes for wastewater treatment.</p> <p>3 Apply the knowledge to solve different operational problems and their remedies</p> <p>4 Understand importance of solid waste management.</p> <p>5 Describe the effects of air pollution and its control measures.</p>
Course code CE 325	Course title Geotechnical Engineering-II	<p>1. Understand various field test for bearing capacity of soil and to investigate the soil.</p> <p>2. Determine the pre consolidation pressure and consolidation in soil.</p> <p>3. Understand the concept of bearing capacity and its analysis by using various equations.</p> <p>4. Evaluate and understand the consolidation settlement and settlement in soil.</p> <p>5. Design the various types of foundation and its calculations</p>

Part- IV Semester-VII

Course code CE 411	Course title DESIGN OF RCC STRUCTURES-I	<p>1. analyse behaviour of structural members under various loadings</p> <p>2. implement concepts of structural design by Limit-state method</p> <p>3. analyze and design the individual members and hence building as a whole</p>
Course code CE 412	Course title STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING	<p>1. understand the structure and behavior of earth during earthquake.</p> <p>2. design earthquake resistant structures.</p> <p>3. know and understand the concept of vibration isolation and techniques.</p>
Course code CE 413	Course title ESTIMATING AND COSTING	<p>1. take out of quantities for various construction projects</p> <p>2. prepare estimates for various civil engineering works and calculate rates for various items of construction</p> <p>3. draft specifications and tender notice</p> <p>4. prepare valuation report for civil engineering structures</p>
Course code	Course title	1. Explain the basics regarding site selection criteria for

CE 414	WATER RESOURCES ENGINEERING-II	<p>reservoir as well as dams. Design earth dam by slip circle method, to study various failures and seepage control of earth dam.</p> <p>2. Demonstrate the various forces acting on gravity dam with magnitude and direction, stability calculations regarding gravity dam.</p> <p>3. Discuss various types of spillways and spillway gates, methods of dissipation of energy.</p> <p>4. Study of typical canal sections, Discuss Kennedy and Lacey's silt theories, and various cross drainage works and diversion headwork and Bligh's and Khosla's seepage theories.</p> <p>5. Show meandering phenomenon, types of river training work and its design. Describe Hydro power generation process and layout of it with its components</p>
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Course code CE 428	Course title ADVANCED ANALYSIS OF STRUCTURE	<ol style="list-style-type: none"> 1. perform analysis of curved members 2. do multistory frames using approximate methods 3. analyze members subjected to unsymmetrical bending, locate shear center and analyze space trusses <p>understand basics of theory of elasticity</p>
Course code CE 429	Course title ENERGY EFFICIENT AND COST-EFFECTIVE BUILDING TECHNOLOGY	<ol style="list-style-type: none"> 1. Understand Alternative Roofing Systems 2. Understand Concepts of Green Building
Course code CE 430	Course title HUMAN RESOURCE MANAGEMENT IN	<ol style="list-style-type: none"> 1. Students will be able to determine the practical application of Human resource Management. 2. Students will be able to determine requirement of human resource,

	CONSTRUCTION	<p>training pattern for employees.</p> <p>3. Students will be able to understand different performance appraisals techniques and various acts used in India for Human welfare.</p>
<p>Course code</p> <p>CE 431</p>	<p>Course title</p> <p>TRANSPORTATION INFRASTRUCTURE PLANNING AND DEMAND ESTIMATION</p>	<p>1. The students after completion of this course will have an in-depth knowledge in Traffic Engineering, Transport Planning, Highway Design and Construction, Sustainable Urban and Transport Development and will be efficient enough to take up projects in the field.</p> <p>2. As the students have a hands-on experience in working with the Software, live projects, field visits to various organizations and training sessions during the course of study, they will be fully fledged Transport and Highway Planner</p>
<p>Course code</p> <p>CE 432</p>	<p>Course title</p> <p>WATERSHED MANAGEMENT</p>	<p>1. Understand sustainable and integrated watershed management and its social aspects</p> <p>2. Understand watershed modeling and use of modern techniques in watershed management.</p> <p>3. Understand study flood, drought and water quality management</p>
Part-IV semester-VIII		
<p>Course code</p> <p>CE 421</p>	<p>Course title</p> <p>DESIGN OF RCC STRUCTURES-II</p>	<p>1. Understand pre-stressed concrete and method of pre-stressing along with its advantages</p> <p>2. Analyze and design Pre-stressed concrete sections</p> <p>3. Analyze and design water tanks resting on ground</p> <p>4. Analyze and design combined footing and retaining wall</p>

Course code CE 422	Course title CONSTRUCTION PRACTICES	<ol style="list-style-type: none"> 1. knowledge about advanced construction techniques 2. aware paradigm shift in construction techniques 3. exposed to developments taking place in construction practices
Course code CE 423	Course title TOWN AND COUNTRY PLANNING	<ol style="list-style-type: none"> 1. Students will be aware about the applications of principle of Town and country Planning 2. Students will be able to understand various terminologies involved in Town Planning 3. Students will be able to understand various concepts of Town Planning 4. Students will learn the planning and designing aspect of Town Planning
Course code CE 438	Course title ADVANCED DESIGN OF STRUCTURES	<ol style="list-style-type: none"> 1. Understand behaviour of special RC structures under various loadings 2. Analyze and design special RC structures 3 Draft detailing of reinforcement in special RC structures as per IS provisions
Course code CE 439	Course title ADVANCED GEOTECHNICAL ENGINEERING	<ol style="list-style-type: none"> 1. Students will be able to plan and execute soil exploration activity. 2. Student will be able to decide soil parameters for foundation design. 3. Student will be able to design foundation for expansive soil. 4. Student will be able to determine bearing capacity of rock.
Course code CE 440	Course title DEVELOPMENT ENGINEERING	<ol style="list-style-type: none"> 1. Students will be able to determine Household and the development agenda. 2. Students will be able to determine The Society and its Organization 3. Students will be able to understand A Sectorial Engineering System. 4. Students will be able to understand

		GIS.
Course code CE 441	Course title DESIGN OF CONCRETE BRIDGES	<ol style="list-style-type: none"> 1. Select the appropriate bridge type for a given site conditions 2. Have state-of-the-art knowledge and practices in bridge engineering 3. Analyze and design of bridge substructure and superstructure
Course code CE 442	Course title STRUCTURAL DYNAMICS	<ol style="list-style-type: none"> 1. Analyze structures subjected to any kind of dynamic excitation and computing quantities like displacements, forces, stresses, etc. 2. Understand the analytical methods and procedures in a way that emphasize physical insight. 3. apply the structural dynamics theory to real-world problems like seismic analysis and design of structures.
Course code CE 448	Course title ENGINEERING OPTIMIZATION	<ol style="list-style-type: none"> 1. To apply optimization concepts to solve actual problems in engineering field. 2. To formulate the field problem and then select appropriate technique to optimize the same within the constraints. 3. To familiarize with optimizing the given engineering problem by adopting a suitable technique effectively.

Course code CE 449	Course title ENGINEERING ECONOMICS AND VALUATION	<ol style="list-style-type: none"> 1. describe elements of Engineering Economy 2. describe elements of valuation of immovable properties 3. value immovable properties by physical methods value immovable properties by methods based on rent, profit, development policy
Course code CE 450	Course title FINITE ELEMENT METHODS	<ol style="list-style-type: none"> 1. Learn the fundamentals of finite element method 2. Model the structural behavior through FE analysis leading to design of structures. 3. Enhance the knowledge in numerical analysis with FE software's and FE programs
Course code CE 451	Course title NUMERICAL METHODS	<ol style="list-style-type: none"> 1. Explain the consequences of finite precision and the inherent limits of the numerical methods considered. 2. Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources. 3. Demonstrate they understand the mathematics concepts underlying the numerical methods considered. 4. Demonstrate understanding and implementation of numerical solution algorithms applied to the following classes of problems: <ol style="list-style-type: none"> a. Finding roots of equations b. Solving systems of algebraic equations c. Curve fitting d. Interpolation
Course code CE 452	Course title REMOTE SENSING AND GIS APPLICATIONS	<ol style="list-style-type: none"> 1. get a basic and advanced level insight into the approach of latest remote sensing techniques 2. understand the subject of Geographical information system as an extension of application software in civil engineering 3. understand various applications of remote sensing in Civil Engineering

