

- **Department Name :- Civil Engineering Department**
- **UG Program Name :- Civil Engineering**
- **Vision and Mission :-**

Department Vision:

To be an outstanding department devoted to provide high end research, technical education in Civil engineering which will produce socially aware professionals to provide solutions to global community.

Department Mission:

- To design curriculum based on changing needs of stakeholders & provide excellence in delivery & assessment to ensure holistic development of civil engineering students.
- To enhance research & consultancy resulting in solving problems related to civil engineering infrastructure as well as society at large.
- To mentor students in pursuit of higher education, entrepreneurship and global professionalism.

Sr. No.	Program Outcomes
1.	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2.	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3.	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4.	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5.	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6.	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7.	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8.	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9.	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10.	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11.	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12.	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Sr. No.	Program Specific Outcomes
1.	PSO1: Enhance employability and/or entrepreneur skills through in-house and onsite training.
2.	PSO 2: Provide solutions/procedures to societal and rural development problems through research and innovative practices.

Academic Year 2018-19

Sr. No.	Semester	Course Code	Course Name	Course Outcome
1	SEM III	SH2051	Engineering Mathematics III	<ol style="list-style-type: none"> 1. After successful completion of this course students should be able to: 2. Acquire and apply basic knowledge of basic mathematical fundamentals 3. Calculate deflection of beams with application of linear differential equations. 4. Apply Fourier series to Civil engineering problems. 5. Demonstrate random variable and probability distribution.
2	SEM III	CE2011	Strength of Material	<ol style="list-style-type: none"> 1. Determine & demonstrate strength & behavior of material under axial shear and bending forces. 2. Calculate various types of load. 3. Construct and calculate shear force and bending moment diagrams & shear and bending stresses for different beam sections for given loading and support conditions. 4. Compute principal stresses and strains for a strained material.

				<ol style="list-style-type: none"> 5. Calculate combined direct and bending stresses in the various structural elements. 6. Compute safe axial load on columns with different end conditions.
3	SEM III	CE2151	Building Planning and Design	<ol style="list-style-type: none"> 1. Prepare drawings of various building components using AutoCAD software 2. Design the components of the building for the given dimensional requirements 3. Choose the site for construction of a residential buildings by following the selection criteria 4. Explain the principles of planning of residential buildings 5. Illustrate the concepts of plumbing and drainage plan 6. Describe the procedures of applying various building finishes
4	SEM III	CE2031	Surveying	<ol style="list-style-type: none"> 1. Apply the surveying principles for completion various civil engineering projects. 2. Calculate reduced levels and contour maps. 3. Prepare the maps for various surveying areas by using the theodolite traverse concept. 4. Use Plane table techniques and its accessories for traversing. 5. Design and Set out the curve on field. 6. Illustrate the principles of advanced EDM instruments.
5	SEM III	SH2219	Environmental Science	<ol style="list-style-type: none"> 1. Understand the importance and sensitivity of environment. 2. Avoid over exploitation of natural resources and follow the environmental ethics. 3. Do the sustainable practices for sustainable development. 4. Protect environment and prevent environmental pollution. 5. Apply their knowledge and skills to solve their environment related problems.
6	SEM III	CE2071	Strength of Material Lab	<ol style="list-style-type: none"> 1. Demonstrate behavior of material under axial shear and bending forces. 2. Identify various types of stresses in various structural elements. 3. Calculate various types of load. 4. Find strengths of different construction materials. 5. Select a material for a given use based on considerations of cost and performance.

				6. Understand the limits of materials and the change of their properties with use.
7	SEM III	CE2111	Building Planning and Design Lab	<ol style="list-style-type: none"> 1. Prepare drawings of various building components using AutoCAD software. 2. Design the components of the building for the given dimensional requirements. 3. Choose the site for construction of residential buildings by following the selection criteria. 4. Explain the principles of planning of residential buildings. 5. Illustrate the concepts of plumbing and drainage plan. 6. Describe the procedures of applying various building finishes.
8	SEM III	CE2091	Surveying Lab	<ol style="list-style-type: none"> 1. Apply the surveying principles for completion various civil engineering projects. 2. Perform precise levelling work for topographic surveying. 3. Calculate reduced levels and Prepare contour maps. 4. Prepare the maps for various surveying areas by using the theodolite traverse concept 5. Use Plane table techniques and its accessories for traversing. 6. Design and Set out the curve on field.
9		CE2131	Programming Skills	<ol style="list-style-type: none"> 1. Explain functions & fundamentals of C Language, 2. Apply commands used in C language 3. Discuss concept of C++ language 4. Differentiate between C & C++ 5. Apply various commands used in C++, 6. Read codes written in C++
10		CE2151	Mini Project	<ol style="list-style-type: none"> 1. Develop as an individual and in group leadership quality. 2. Identify and analyse social problems in Civil Engineering. 3. Develop presentation skill through oral and report writing. 4. Acquire theoretical knowledge regarding various problems in Civil Engineering.
11		CE2021	Structural Analysis	<ol style="list-style-type: none"> 1. Calculate slopes and deflections at various locations for different types of beams. 2. Calculate forces in the members of determinate trusses and deflection of determinate trusses.

				<ol style="list-style-type: none"> 3. Calculate hinge reactions at the end hinges of three hinged arches. 4. Calculate shear force and bending moments at the various sections of three hinged arches. 5. Construct ILD for determinate beams and 2D trusses. 6. Analyze and design circular shafts subjected to torsion. 7. Calculate strain energy stored in the material due to gradual, sudden and impact loads. 8. Analyze and design columns using Euler's and Rankine's formulae.
12	SEM IV	CE2141	Fluid Mechanics	<ol style="list-style-type: none"> 1. Analyze different physical properties of fluid. 2. Compute dimensional analysis and model studies. 3. Compute the velocity and acceleration of fluid particle. 4. Know velocity distribution and shear stresses in turbulent flow. 5. Evaluate major and minor losses in pipes. 6. Conversant with dimensional analysis
13		CE2061	Water Resource Engineering	<ol style="list-style-type: none"> 1. Define hydrology and hydrological cycle. 2. Compute average precipitation by Arithmetic, Thiessen polygon and Isohytel method. 3. Discuss the factors affecting on stream flow site selection. 4. Explain factors affecting on runoff. 5. Identify factors governing consumptive use of water. 6. Categorize various factors affecting on groundwater hydrology.
14	SEM IV	CE2081	Engineering Geology and GIS Application	<ol style="list-style-type: none"> 1. Identify common Earth materials and interpret their composition, origin, and uses. 2. Recognize and interpret geological structures, and be able to apply their knowledge and skills to interpret earth processes. 3. Classify hydro geological properties of various rocks. 4. Describe the processes operating at and beneath the Earth's surface, how those processes create the Earth's landscape and how humans affect and are affected by the processes. 5. Compare the suitable site s for construction of dam, tunnel in different geological formation and geological structures. 6. Effectively understand and interpret spatial relationships of geological and geographical features.

15		CE2101	Building Planning and Design	<ol style="list-style-type: none"> 1. Prepare perspective drawings of simple objects and building components using the step wise procedure. 2. Apply the principles of architectural composition in planning and designing of public buildings. 3. Plan and Design a given public buildings based on its functional requirements and site considerations. 4. Describe methods of controlling the noise in the building. 5. Use Sabine's formula for finding reverberation time required for acoustic design of building. 6. Demonstrate the fire extinguishing equipments for preventing the fire in buildings.
16	SEM IV	CE2121	Fluid Mechanics Lab	<ol style="list-style-type: none"> 1. Verify of Bernoulli's theorem 2. Determine of metacentric height 3. Use an orifice for discharge measurement 4. Use a venturimeter for discharge measurement in a pipe flow 5. Compute loss of head due to i) Sudden expansion, ii) contraction iii) elbow iv) bend v) globe Valve etc. 6. Construct flow net for given flow conditions
17		CE2141	Building Planning Design Lab	<ol style="list-style-type: none"> 1. Explain the terms used in perspective drawing 2. Specify the distances between picture plane and station point; and ground level and eye level 3. Prepare one point perspective drawing and two point perspective drawings of given building/ components using AutoCAD 4. Plan and design a given public building based on the requirements 5. Apply the principles of planning and also, the principles of architecture for planning of public buildings 6. Prepare the building plan, elevation, sectional elevation of given public building using AutoCAD software by adopting appropriate scale.
18	SEM IV	CE2161	Engineering Geology and GIS Application Lab	<ol style="list-style-type: none"> 1. Recognize and describe common geological formations of relevance to civil engineering. 2. Identify the different Rock types. 3. Implement various methods for water conservation techniques. 4. Use of electrical resistivity method for determining depth of bedrock or groundwater. 5. Prepare map using any post processing software for data collected by TS and GPS Receiver. 6. Prepare DEM by using GIS software.

19	SEM V	CE3011	Design of Steel Structures	<ol style="list-style-type: none"> 1. Refer and use design codes and hand book for design of steel structural elements. 2. Determine the load carrying capacity of the sections for different actions. 3. Analyze the members for design loads. 4. Design steel structural members. 5. Design the connections.
20	SEM V	CE3031	Soil Mechanics	<ol style="list-style-type: none"> 1. Describe the significance of the basic physical and mechanical properties of soils. 2. Demonstrate the experimental methods used to measure the soil behavior. 3. Compute an engineering classification of a given soil. 4. Recognize the basic fundamental soil mechanics principles underlying common Civil Engineering applications. 5. Estimate the engineering prosperities for various soils to solve geotechnical problems with come across in Civil Engineering, also with aware of more advanced techniques that is available for solving of problems. 6. Calculate water flow through ground, and understand the effects of seepage on the stability of structures. 7. Recognize the importance of professional, clear, concise technical reports and letters to clients and colleagues.
21	SEM V	CE3051	Infrastructure Engineering I	<ol style="list-style-type: none"> 1. Geometric design flexible and rigid pavement of road sections. 2. Design and construction of pavements. 3. Design and construction methods of tunnel. 4. Geometric design and construction methods of Airport. 5. Geometric design and construction methods of Docs and Harbors
22	SEM V	CE3071	Water Supply Engineering	<ol style="list-style-type: none"> 1. Explain Quality and Quantity of water. 2. Prepare to calculate Water requirement for domestic use. 3. Investigate water source and water treatment for various water quality parameters. 4. Design water supply scheme and water treatment plant.

				5. Evaluate efficiency of water treatment units and distribution network.
23	SEM V	CE3091	Engineering Management	<ol style="list-style-type: none"> 1. Identify the need of project management for success of Civil engineering projects. 2. Develop and analyze the network diagram of civil engineering project. 3. Calculate optimum time and optimum cost of project through network compression. 4. Discuss computer based project management. 5. Analyze network diagram by precedence method. 6. Choose most economical alternative for civil engineering projects through various economic comparison methods. 7. Apply various techniques for inventory control.
24	SEM V	CE3111	Soil Mechanics Laboratory	<ol style="list-style-type: none"> 1. Describe the significance of the basic physical and mechanical properties of soils. 2. Demonstrate the experimental methods used to measure the soil behavior. 3. Compute an engineering classification of a given soil. 4. Recognize the basic fundamental soil mechanics principles underlying common Civil Engineering applications. 5. Estimate the engineering prosperities for various soils to solve geotechnical problems with come across in Civil Engineering, also with aware of more advanced techniques that is available for solving of problems. 6. Calculate water flow through ground, and understand the effects of seepage on the stability of structures. 7. Recognize the importance of professional, clear, concise technical reports and letters to clients and colleagues.
25	SEM V	CE3131	Transportation Engineering Lab	<ol style="list-style-type: none"> 1. Solve problems from highway pavement design. 2. Understand different d methods of testing of materials. 3. Differentiate physical properties of highway materials as per IRC. 4. Visit report based on live structure construction
26	SEM V	CE3151	Engineering Management Lab	<ol style="list-style-type: none"> 1. Identify the need of project management for success of Civil engineering projects.

				<ol style="list-style-type: none"> 2. Develop and analyze the network diagram of civil engineering project. 3. Calculate optimum time and optimum cost of project through network compression. 4. Discuss computer based project management. 5. Analyze network diagram by precedence method. 6. Choose most economical alternative for civil engineering projects through various economic comparison methods. 7. Apply various techniques for inventory control.
27	SEM V	CE3171	Water Supply Engineering Lab	<ol style="list-style-type: none"> 1. Explain Quality and Quantity of water. 2. Prepare to calculate Water requirement for domestic use. 3. Investigate water source and water treatment for various water quality parameters. 4. Design water supply scheme and water treatment plant. 5. Evaluate efficiency of water treatment units and distribution network.
28	SEM VI	CE3021	Theory of Structures	<ol style="list-style-type: none"> 1. Analyse indeterminate structures using force methods- Consistent deformation method and three moment equation. 2. Apply energy principles/theorems for analysis of indeterminate beams, truss, portal frames and two hinged parabolic arches. 3. Analyse indeterminate structures using displacement methods- Slope-deflection equation and moment distribution method. 4. Analyse indeterminate beam and portal frame using matrix methods of analysis-
29	SEM VI	CE3041	Foundation Engineering	<ol style="list-style-type: none"> 1. Investigate soil using different soil exploration methods. 2. Compute settlement & bearing capacity of shallow and deep foundation 3. Design shallow and deep foundation for different soil type. 4. Analyze stability of slope using different slope stability analysis techniques.
30	SEM VI	CE3061	Estimation and Costing	<ol style="list-style-type: none"> 1. Apply standard requirements to prepare detailed estimate. 2. Prepare detailed estimate of building, factory shed, road, canal and culvert. 3. Derive Rates for construction items. 4. Prepare tenders and contracts documents. 5. Perform valuation of property.
31	SEM VI	CE3081	Concrete Technology	<ol style="list-style-type: none"> 1. Apply material properties in the process of design and manufacture of concrete mixes.

				<ol style="list-style-type: none"> Justify qualities of ordinary and special concretes based on their properties. Design concrete mixes of given grade using standard mix design procedures. Evaluate the quality of concrete through visual inspection/non-destructive testing. Illustrate various mechanisms affecting the durability properties of concrete.
32	SEM VI	CE3101	Wastewater Engineering	<ol style="list-style-type: none"> Interpret characteristics of wastewater and its significance in design of Treatment Plant. Select appropriate treatment technology for wastewater treatment. Design sewerage system and wastewater treatment plant (STP) for domestic wastewater. Suggest appropriate method for disposal of wastewater. Illustrate emerging technologies for waste water treatment.
33	SEM VI	CE3141	Design of Steel Structures Laboratory	<ol style="list-style-type: none"> Analyze and design steel industrial shed using STAAD-Pro software. Interpret the results obtained from the software. Prepare structural drawing of steel industrial shed.
34	SEM VI	CE3121	Estimating & Costing Lab	<ol style="list-style-type: none"> Perform market survey to collect current market rates of civil engineering materials and labours. Prepare detailed estimate of different structures like building, road, canal, culvert and factory shed etc. Prepare bar bending schedule of different RCC items.
35	SEM VI	CE3161	Concrete Technology Lab	<ol style="list-style-type: none"> Conduct quality control tests on various ingredients of concrete Design and Test concrete mix as per the standard guidelines Evaluate the quality of concrete or elements of concrete using Non-destructive testing equipments. Prepare formwork models for RCC element.
36	SEM VII	CE3081	Design of Reinforced Concrete Elements	<ol style="list-style-type: none"> Analyze and design singly & doubly reinforced and flanged beams. Analyze and design R.C.C. slab and R.C.C. staircase. Analyze and design R.C.C. columns, isolated pad footing and combined footing.
37	SEM VII	CE4041	Infrastructure Engineering II	<ol style="list-style-type: none"> Design Geometric Components of Rail Transportation System Analyze need of modern rail system Perform site investigation for bridge

				<ol style="list-style-type: none"> 4. Estimate surface runoff and classify bearings and joints 5. Interpret IS standards for railway and road bridge system
38	SEM VII	CE3041	Irrigation & Hydraulic Structure	<ol style="list-style-type: none"> 1. Discuss construction and maintenance aspects of hydraulic structures. 2. Design hydraulic structures. 3. Analyze gravity and earthen dam for various hydraulic conditions. 4. Discuss components parts of hydraulic structures. 5. Illustrate river training works required to regulate the flow.
39	SEM VII	CE4071	Construction Methods and Equipments	<ol style="list-style-type: none"> 1. Plan equipment utilization for earthwork operation. 2. Perform economic analysis of equipments 3. Select earthwork equipment based on production and site requirements 4. Optimize Plant layout. 5. Justify the construction method selected for particular task
40	SEM VII	CE4051	Earthquake Resisting Structure	<ol style="list-style-type: none"> 1. Evaluate dynamic response for SDOF system for different loads. 2. Calculate lateral loads developed due to earthquake force by linear methods. 3. Examine different methods available for reducing effects of dynamic loads.
41	SEM VII	CE4061	Design of Concrete Structure Lab	<ol style="list-style-type: none"> 1. Estimate design loads on building referring appropriate Indian Standard Codes and handbooks. 2. Design the component parts of the building manually. 3. Design the building using any standard software.
42	SEM VII	CE4111	Construction Contracts and Valuation Lab	<ol style="list-style-type: none"> 1. Apply rights and responsibilities of parties involved in contracts 2. Prepare contract document. 3. Classify different types of values and methods of valuation. 4. Prepare valuation report for the open land and different buildings.
43	SEM VII	CE4231	Primavera Lab	<ol style="list-style-type: none"> 1. Prepare schedule plan for construction project. 2. Develop residential building construction project in primavera software. 3. Analyze construction project in primavera software. 4. Prepare and present various types of reports.
44	SEM VII	CE4091	Estimating and Costing Lab II	<ol style="list-style-type: none"> 1. Prepare estimate for public building. 2. Discuss specifications for various items of public building.

				3. Perform rate analysis for various items of public building
45	SEM VII	CE4232	Employment Enhancement Skills	<ol style="list-style-type: none"> 1. Develop technical competence in a Soft skill in the Civil Engineering field, 2. Apply the techniques and soft skills for Civil Engineering practice. 3. Develop oral and written presentation skills for soft skill project. 4. Design and interpret data by soft skill Civil Engineering projects.
46	SEM VIII	CE4121	Advanced Structural Design	<ol style="list-style-type: none"> 1. Analyze the slabs of irregular shapes by yield line theory and design rectangular and circular slabs for yield moments. 2. Analyze and design flat slab. 3. Analyze and design cantilever and counter fort retaining walls. 4. Analyze and design building frames. 5. Analyze and design over head water tanks. 6. Analyze and design pile foundation.
47	SEM VIII	CE4171	Advanced Structural Analysis	<ol style="list-style-type: none"> 1. Construct ILD for indeterminate beams and two hinged arches. 2. Compute bending stresses in beam subjected to unsymmetrical bending 3. Analyze beams curved in plan, multistoried buildings and space frames.
48	SEM VIII	CE4271	Advanced Engineering Geology	<ol style="list-style-type: none"> 1. Evaluate geological formations and site suitability for construction of major civil structures 2. Apply geophysical methods for subsurface exploration 3. Examine the geo-environmental hazards
49	SEM VIII	CE4201	Finite Element Analysis	<ol style="list-style-type: none"> 1. Apply variational and direct approach method for 1D, 2D problems. 2. Develop stiffness matrix for linear spring, bars, beam and truss (1D, 2D & 3D problem). 3. Explain terminology used in FEM 4. Generate relationship between natural and cartesian coordinate system. 5. Formulate element stiffness matrix for axisymmetric elements.
50	SEM VIII	CE4121	Advanced Structural Design	<ol style="list-style-type: none"> 1. Analyze and design RC structures and their components like building frames, flat slab, retaining walls, water tanks and piles. 2. Use relevant codes and apply codal provisions for analysis and design of RC structures and their components.

				<ol style="list-style-type: none"> 3. Analyze the slabs of irregular shapes by yield line theory and design rectangular and circular slabs for yield moments. 4. Show detailing of reinforcement in structural components of building frames, flat slab, retaining walls, water tanks and piles.
51	SEM VIII	CE4151	Solid and Hazardous Waste Management	<ol style="list-style-type: none"> 1. Determine solid waste properties and quantity for municipal and hazardous waste. 2. Illustrate health effects by municipal, hazardous waste. 3. Design Physicochemical and biological treatment and landfill site for solid waste.
52	SEM VIII	CE4241	Geo-informatics for Engineering	<ol style="list-style-type: none"> 1. Apply GIS tool for solving civil engineering industry problem 2. Perform infrastructural planning 3. Analyse spatial data and query analysis 4. Develop base and thematic maps 5. Develop projects and device solution for the area.
53	SEM VIII	CE4311	Advanced Foundation Engineering	<ol style="list-style-type: none"> 1. Interpret wells, caissons foundation & cofferdams in soil. 2. Discriminate soil structure interaction between static & dynamic analysis. 3. Illustrate the application of various modern techniques in construction of foundation. 4. Justify the appropriate method for the design of foundation.
54	SEM VIII	CE4141	Air Pollution and Control	<ol style="list-style-type: none"> 1) Explain structure of the atmosphere Air Pollution, Scales of air pollution 2) Interpret on sources of air pollution natural and artificial, air pollution Episodes 3) Explain effect of different air pollutants on man, animals and plants. 4) Design Stack height and explain meteorology, transport and control mechanism 5) Explain noise pollution.
55	SEM VIII	CE4211	Advanced Construction Materials	<ol style="list-style-type: none"> 1. Summarize the properties of various advanced & special materials of construction. 2. Recommend the use of appropriate building materials to suit the construction requirements. 3. Illustrate the application methods of various building materials for construction works.
56	SEM VIII	CE4231	Project Appraisal	<ol style="list-style-type: none"> 1) Apply project appraisal performance measurements to a project, 2) Analysis project on basis of market & demand, technical feasibility, financial feasibility & cash flow.

				<ul style="list-style-type: none"> 3) Interpret social cost benefit analysis of Civil Engineering project. 4) Estimate environmental & social impact of project.
57	SEM VIII	CE4251	Construction Safety	<ul style="list-style-type: none"> 1. Suggest safety precautions to be taken during the execution of various construction works 2. Predict possible hazards and accidents in construction projects 3. Interpret various legal aspects of safety in construction.
58	SEM VIII	CE4361	Fundamentals of Urban Planning	<ul style="list-style-type: none"> 1. Explain principles and necessity of town planning. 2. Interpret all public Amenities useful for town planning. 3. Compare most efficient traffic management system for town planning. 4. Choose public utility services for rapid transportation. 5. Criticize planning on various Central Acts and State Acts.
59	SEM VIII	CE4381	Optimization Techniques	<ul style="list-style-type: none"> 1. Identify the necessity and scope of optimization techniques. 2. Analyze the managerial problem through models and arrive at an optimal solution or decision.
60	SEM VIII	CE4241	Disaster Management	<ul style="list-style-type: none"> 1. Analyze effects of natural and manmade disasters. 2. Demonstrate disaster management program. 3. Analyze vulnerable conditions and risk assessment. 4. Construct layout for sanitary landfill site and composting site 5. Describe stakeholder's role in disaster response.
61	SEM VIII	CE4261	Building Services and Maintenance	<ul style="list-style-type: none"> 1. Develop asset management plan, 2. Perform structural assessment of civil engineering structures, 3. Decide repairs and preventive actions required for buildings, 4. Develop detailed maintenance plan, 5. Select structural strengthening method and material.
62	SEM VIII	CE4291	Green Technologies in Civil Engineering	<ul style="list-style-type: none"> 1. Explain the economic benefits of a green building 2. Classify the terms and the construction methodologies between "traditional building" and "green building". 3. Evaluate the status of building for various green building rating system

63	SEM VIII	CE4461	Industrial Waste Treatment	<ol style="list-style-type: none"> 1. Explain the economic benefits of a green building 2. Classify the terms and the construction methodologies between “traditional building” and “green building”. 3. Evaluate the status of building for various green building rating system
64	SEM VIII	CE4191	Design of Flyovers and Bridges	<ol style="list-style-type: none"> 1. Design superstructure and sub-structure for different types of bridges 2. Design different types of bearings for bridges 3. Design of long span bridges
65	SEM VIII	CE4321	Probability and Statistics	<ol style="list-style-type: none"> 1. Use statistical methodology and tools in the engineering problem-solving process. 2. Compute and interpret descriptive statistics using numerical techniques. 3. Apply the basic concepts of probability, random variables, probability distribution, and joint probability distribution. 4. Compute point estimation of parameters, explain sampling distributions, and understand the central limit theorem. 5. Construct confidence intervals on parameters for a single sample.
66	SEM VIII	CE4581	Advanced Structural Design Lab	<ol style="list-style-type: none"> 1. Analyze and design structures such as flat slab, retaining wall, overhead water tanks and foundation using standard software. 2. Sketch the detailing of the reinforcement.
67	SEM VIII	CE4461	Industrial Wastewater Treatment	<ol style="list-style-type: none"> 1. Interpret techniques of wastewater volume and strength reduction in industrial process. 2. Analyze and explain characteristics of industrial wastewater. 3. Select appropriate treatment technology for industrial wastewater treatment. 4. Design Effluent Treatment Plant (ETP) for industrial wastewater treatment.. 5. Explain role of statutory bodies and legal aspects in pollution control.
68	SEM VIII	CE4421	Industrial Wastewater Treatment Lab	<ol style="list-style-type: none"> 1. Analyze and explain characteristics of industrial wastewater. 2. Select appropriate treatment technology for industrial wastewater treatment. 3. Design Effluent Treatment Plant (ETP) for industrial wastewater treatment.
69	SEM VIII	OE413	Environmental Impact Assessment	<ol style="list-style-type: none"> 1. To study and apply EIA methods. 2. To analyse the all projects by using Environmental Impact assessment tool.

				<ol style="list-style-type: none"> 3. To provide solution for decision making in Industrial development Problem. 4. To prepare EIA report for submission to concerned authority.
70	SEM VIII	OE412	Material Management	<ol style="list-style-type: none"> 1. Apply management principles to material management. 2. Develop and apply codification and standardization process for materials. 3. Derive material procurement plan and evaluate vendors for procurement. 4. Apply inventory control techniques for material management. 5. Develop stores layout for optimum stores management. 6. Apply M.R.P. logic and systems to material management