

B. TECH. (CIVIL ENGINEERING)

Establish the correlation between the courses and the Program Outcomes (POs) and Program Specific Outcomes (PSOs).

Program Outcomes:

1. **Engineering knowledge:** An Ability to apply the knowledge of mathematics, science, and engineering fundamentals and an engineering specialization to the solution of complex Civil engineering problems.
2. **Problem analysis:** An Ability to design experiments for the required cause and subsequently analyse and interpret the data acquired from the experiment to draw apt conclusions.
3. **Design/development of solutions:** ability to design, plan and execute a safe system or its component satisfying functionality and serviceability.
4. **Conduct investigations of complex problems:** An ability to analyse, design and execute an Engineering project involving need of multidisciplinary expertise.
5. **Modern tool usage:** An ability to select and use modern equipment's, software programs available to conduct complex tasks in Civil Engineering.
6. **The engineer and society:** An ability to identify and offer solutions to problems in areas of social importance of transportation, water treatment and supply, legal aspects.
7. **Environment and sustainability:** An ability to assess environmental impact of various projects involving Civil Engineering and envisage acceptable sustainable solutions to curb environmental damage
8. **Ethics:** An understanding of professional practice issues and the importance of licensure.
9. **Individual and team work:** An ability to segregate and function in domains of work requiring individual credentials and team effort.
10. **Communication:** Ability to articulate unambiguous technical language through oral and written communication.
11. **Project management and finance:** An ability to exercise efficient planning of the project lifecycle and fund release schedule of the Civil Engineering project.
12. **Life-long learning:** An ability to accommodate ongoing philosophical and technological advances in field of Civil Engineering.

Program Specific Outcomes:

PSO1: The graduates in Civil Engineering will be able to Analyse, Design, Construct, and Maintain and operate infrastructural projects

PSO2: The graduates in Civil Engineering will be able assess the environmental impact of various projects and take required measures to curb environmental deterioration

PSO3: The graduates in Civil Engineering will be able to use latest software pertaining to various streams of Civil Engineering

Course Name: (Concrete Technology -)			
Code	Course Outcomes	POs	PSOs
	Explain the properties of the constituent materials of concrete	P01, P04, P012	PS01
	Describe the behavior of concrete at its fresh and hardened state	P01, P03, P04, P012	-
	Test on hardened concrete	P01, P02, P03, P04, P012	-
	Design the mix proportions by BIS method	P01, P02, P03, P04	PS01
	Explain special concretes and their application for practical purpose	P01, P04, P012	PS01

Course Outcomes and PO / PSO addressed by each CO

Course Name (Concrete Technology)												
CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO1 0	PO1 1	PO1 2
C301.1	2	-	-	1	-	-	-	-	-	-	-	2
C301.2	2	-	1	2	-	-	-	-	-	-	-	2
C301.3	2	3	3	1	-	-	-	-	-	-	-	2
C301.4	2	3	2	1	-	-	-	-	-	-	-	-
C301.5	2	-	-	2	-	-	-	-	-	-	-	2
Average	2	3	2	1.4	-	-	-	-	-	-	-	2

Correlation between COs and Pos

Course Name (Concrete Technology -)			
CO	PS01	PS02	PS03
C301.1	1	-	-
C301.2	-	-	-
C301.3	-	-	-
C301.4	2	-	-
C301.5	1	-	-
Average	1.3	-	-

Correlation between COs and PSOs

Course Name: (Surveying)Year & Sem: II-I												
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO 12
C204.1	2	3	3	3	-	2	-	-	-	-	2	2
C204.2	3	2	2	2	-	1	-	-	-	-	2	2
C204.3	3	3	2	3	-	2	-	-	-	-	2	3
C204.4	3	2	3	2	-	-	-	-	-	-	2	3
C204.5	3	3	3	3	-	-	-	-	-	-	2	2
Average	2.8	2.6	2.6	2.6	-	1.6	-	-	-	-	2	2.4

Course Name: (Surveying)			
CO	PSO1	PSO2	PSO3
C204.1	1	-	-
C204.2	-	-	-
C204.3	1	-	-
C204.4	-	-	-
C204.5	-	-	-
Average	1	-	-

Course Name: (Structural Analysis-I)Year & Sem: II-II												
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
C213.1	3	3	3	-	-	-	-	-	-	-	-	2
C213.2	2	2	2	-	-	-	-	-	-	-	-	-
C213.3	3	3	3	-	-	-	-	-	-	-	-	-
C213.4	2	2	2	-	-	-	-	-	-	-	-	2
C213.5	2	3	2	-	-	-	-	-	-	-	-	2
Average	2.4	2.6	2.4	-	-	-	-	-	-	-	-	2

Course Name: C213(Structural Analysis-I)			
CO	PSO1	PSO2	PSO3
C213.1	1	-	-
C213.2	1	-	-
C213.3	2	-	-
C213.4	1	-	-
C213.5	2	-	-
Average	1.4	-	-

Course Name (Engineering Geology) Year & Sem: III-I												
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO 12
C303.1	3	-	1	2	-	1	1	-	-	-	-	-
C303.2	-	2	-	1	-	2	-	-	-	-	-	-
C303.3	2	-	1	1	-	2	2	-	-	-	-	-
C303.4	-	-	2	2	-	1	1	-	-	-	-	-
C303.5	2	-	2	2	-	1	2	-	-	-	-	-
Average	2.3	2	1.5	1.6	-	1.4	1.5	-	-	-	-	-

Course Name (Engineering Geology)			
CO	PS01	PS02	PS03
C303.1	1	1	-
C303.2	1	1	-
C303.3	1	-	-
C303.4	-	-	-
C303.5	1	1	-
Average	1	1	-

Course Name: C311(Transportation Engineering-I)Year & Sem: III-II												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C311.1	3	2	2	2	-	2	2	-	-	-	1	2
C311.2	2	2	3	2	-	-	-	-	-	-	1	1
C311.3	2	2	3	2	-	-	-	-	-	-	-	2
C311.4	3	3	2	3	-	-	-	-	-	-	-	3
C311.5	2	2	3	2	-	-	-	-	2	-	-	2
Average	2.4	2.2	2.6	2.2	-	2	2	-	2	-	1	2

Course Name: C311(Transportation Engineering-I)			
CO	PS01	PS02	PS03
C311.1	2	2	-
C311.2	2	1	-
C311.3	-	-	-
C311.4	-	-	-
C311.5	1	1	-
Average	1.6	1.3	-

Course Name: C403 (Estimating & Costing) Year & Sem: IV-I												
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO 12
C403.1	2	-	2	2	-	-	-	-	-	-	-	2
C403.2	3	2	3	3	-	-	-	-	-	-	2	2
C403.3	2	3	3	2	-	2	-	-	-	-	-	1
C403.4	2	3	2	2	-	2	-	-	-	-	-	2
C403.5	3	2	3	3	-	-	-	-	-	-	2	3
Average	2.4	2.5	2.6	2.4	-	2	-	-	-	-	2	2

Course Name: C403 (Estimating & Costing)			
CO	PSO1	PSO2	PSO3
C403.1	1	-	-
C403.2	2	-	-
C403.3	1	-	-
C403.4	1	-	-
C403.5	2	-	-
Average	1.4	-	-

Course Name: (Construction Management) Year & Sem: IV-II												
CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
C411.1	2	-	-	-	-	-	-	-	-	-	-	-
C411.2	2	-	-	-	3	-	-	-	-	-	-	-
C411.3	3	-	-	-	-	-	-	-	-	-	2	-
C411.4	2	-	-	-	-	-	-	2	-	-	-	-
C411.5	3	-	-	-	-	-	-	-	-	-	-	-
Average	2.4	-	-	-	3	-	-	2	-	-	2	-

Course Name: (Construction Management)			
CO	PSO1	PSO2	PSO3
C411.1	3	-	-
C411.2	2	-	-
C411.3	3	-	-
C411.4	3	-	-
C411.5	3	-	-
Average	2.8	-	-

Department of Civil Engineering
B. Tech II YEAR I SEMESTER

S. No.	Course Code	Course Title
1	BS301MT	Mathematics-III
2	ES301CE	SurveyingandGeomatics
3	PC301CE	IntroductiontoSolidMechanics
4	PC302CE	IntroductiontoFluidMechanics
5	PC303CE	MaterialTestingandEvaluation
6	ES401ME	ElementsofMechanicalEngineering
7	MC 302CE	EnvironmentalSciences
8	ES351CE	Surveyinglaboratory
9	PC351CE	FluidMechanics-Ilaboratory

B. Tech II YEAR II SEMESTER

S. No.	Course Code	Course Title
1	HS301MC	Managerial Economics andAccountancy
2	PC401CE	MechanicsofMaterials
3	PC402CE	StructuralEngineering
4	PC403CE	HydraulicEngineering
5	PC404CE	Hydrology and water management
6	PC405CE	ConstructionEngineeringandManagement
7	PC401BS	EngineeringGeology
8	PC 451 CE	MaterialTestingLaboratory
9	PC452CE	Fluid mechanics lab-II
10	PC453BS	Engineering Geology Lab
11	ES461CE	SurveyCamp

1. Mathematics-III

Course Name: (Mathematics-III-BS301MT)	
C01	Classify the types of random variables and calculate mean and variance.
C02	Calculate the correlation and regression to the given data.
C03	Understand the foundation for classical inference involving confidence interval and hypothesis testing.
C04	Apply testing of hypothesis for large samples and small samples, stochastic matrix and limiting probabilities.
C05	Describe the queuing system, mean arrival and service rates & Calculate expected queue length and waiting lines, Define random process, Markov chain

2. Surveying and Geomatics

Course Name: (Surveying and Geomatics -ES301CE)	
C01	Identify the use of three basic surveying tools, the tape, the level and the theodolite & application of geometric & trigonometric principles to basic surveying calculations
C02	Assemble efficient & accurate, legible & complete notes in a well-prepared surveying field book & basic type of survey & the responsibilities of a surveying team
C03	Differentiate the limitations of the basic surveying instruments & the possible errors that could arise
C04	Interpret of drawing techniques in the development of a tope graphic map & calculations of areas & volumes of irregular and regular boundaries
C05	Evaluate & recognize the different methods of calculations of heights and distance using angular measurements

3. Introduction to Solid Mechanics

Course Name: (Introduction to Solid Mechanics-PC301CE)	
C01	Calculate the stress and strain developed in structural member due to external load
C02	Draw the shear force and bending moment diagram for different types of beam
C03	Determine the bending and shear stresses of different beam sections
C04	Evaluate the slope and deflection of beams subjected to loads
C05	Determine the principal stresses and strain in structured members

4. Introduction to Fluid Mechanics

Course Name: (Introduction to Fluid Mechanics –PC302CE)	
C01	Understand the broad principles of fluid statics, kinematic and dynamics.
C02	Understand definitions of the basic terms used in fluid mechanics and characterizes of fluids and its flow.
C03	Understand classifications of fluid flow.
C04	Be able to apply the continuity, momentum and energy principle.
C05	Able to demonstrate boundary layer concepts.

5. Materials Testing and Evolution

Course Name: (Material Testing and evaluation-PC303CE)	
C01	Define the Basic terminology that is used in the industry
C02	Categorize different building materials, properties and their uses
C03	Understand the Prevention of damage measures and good workmanship
C04	To realize the technique employed to use waste material in the construction
C05	To understand the temporary equipment scaffolding, underpinning.

6. Elements of Mechanical Engineering

Course Name: (Elements of Mechanical Engineering -ES401ME)	
C01	To understand the mechanical equipment for the usage at civil engineering systems
C02	To familiarize with the general principles and requirement for refrigeration, manufacturing
C03	To realize the techniques employed to construct civil engineering systems.
C04	To familiarize with the general principles and requirement for refrigeration
C05	To familiarize with the general principles and requirement for manufacturing

7. Surveying Laboratory

Course Name:(Surveying Laboratory–ES351CE)	
C01	Gain the practical knowledge on calculation of an area, volume of an irregular and regular land surface using chain & tape.
C02	Operate different types of instruments in surveying. Perform leveling and contouring at ground surfaces.
C03	Apply knowledge of mathematics in surveying field to calculate areas and volume

	for different projects.
C04	Utilize total station and other modern survey instrument.
C05	Apply the principle of surveying for civil Engineering Applications

8.Fluid mechanics Lab-1Laboratory

Course Name: (Fluid mechanics Lab-1 Laboratory-PC351CE)	
C01	Determine coefficient of discharge for orifice and mouthpiece.
C02	Calibrate notches venturi meter orifice meters
C03	Determine minor losses in pipes
C04	Verification of Bernoulli's equation
C05	Calibration of contracted Rectangular Notch / Triangular Notch/Trapezoidal Notch.

9.Managerial Economics and Accountancy

Course Name: (Managerial Economics and Accountancy-HS301MC)	
C01	Understand the various Forms of Business and the impact of economic variables on the Business.
C02	Understand the elasticity of the demand of the product, different types, measurement of elasticity of demand and factors influencing on elasticity of demand.
C03	Enumerate the features, price-output determination under Perfect Competition, Monopoly and Monopolistic competition Markets.
C04	Illustrate the Significance of financial accounting, double entry system, accounts, accounting concepts and convention
C05	Study the firm's financial position by analyzing the Financial Statements of a Company

10. Mechanics of Materials

Course Name: (Mechanics of Materials-PC401CE)	
C01	Determine stresses in the member subjected to Torsion
C02	Analyze columns and struts
C03	Understand the concept of direct and bending stresses
C04	Analyze and design springs, thin and thick cylinders
C05	Understand the concept of unsymmetrical bending

11. Structural Engineering

Course Name: (Structural Engineering -PC402CE)	
C01	Design of reinforced concrete beams by limit state method And working stress method.
C02	Design of reinforced concrete columns by limit state method.
C03	Design of reinforced concrete footings by limit state method.
C04	Design of reinforced concrete slabs by limit state method.
C05	Design of reinforced concrete dog legged stair case by limit state method.

12. Hydraulics Engineering

Course Name: (Hydraulics Engineering -PC403CE)	
C01	Understand the concepts of channel flows.
C02	Compute flow profiles in channel transitions and analyze hydraulic transients
C03	Design the working proportions of hydraulic machines
C04	Understand the working principles for various and working of different components of Kaplan, Francis and Pelton turbines.
C05	Understand the concept of NPSH, performance of pumps and working efficiency.

13. Hydrology & Water Management

Course Name: (Hydrology & Water Management-PC404CE)	
C01	Analyze hydro-meteorological data
C02	Estimate abstractions from precipitation
C03	Compute yield from surface and subsurface basin
C04	Develop rainfall-runoff models
C05	Formulate and solve hydrologic flood routing models

14. Construction Engineering and Management

Course Name: (Construction Engineering and Management -PC405CE)	
C01	Evaluate the principles of quality management and to explain how these principles can be applied within quality management systems
C02	Identify the key aspects of the quality improvement cycle and to select and use appropriate tools and techniques for controlling, improving and measuring quality.
C03	Critically appraise the organizational, communication and teamwork requirements for effective quality management
C04	Critically analyse the strategic issues in quality management, including current issues and developments, and to devise and evaluate quality implementation plans
C05	Outline characteristics of Total Quality Management

15. Engineering Geology

Course Name:(Engineering Geology -PC401BS)	
C01	Understand weathering process and mass movement.
C02	Distinguish geological formations.
C03	Identify geological structures and processes for rock mass quality.
C04	Identify subsurface information and groundwater potential sites through geophysical investigations.
C05	Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels.

16. Material Testing Laboratory

Course Name:(Material Testing Laboratory-PC451CE)	
C01	Conduct tension test on Materials like steel etc.
C02	Conduct compression tests on spring, wood and concrete
C03	Conduct flexural and torsion test to determine elastic constants
C04	Determine hardness of metals
C05	Conduct impact test on Materials like aluminum, cast iron and mild steel.

17. Fluid Mechanics Lab - II

Course Name: (Fluid Mechanics lab - II-PC452CE)	
C01	Understand the concepts of channel flows.
C02	Compute flow profiles in channel transitions and analyze hydraulic transients
C03	Design the working proportions of hydraulic machines
C04	Understand the working principles for various and working of different components of Kaplan, Francis and Pelton turbines.
C05	Understand the concept of NPSH, performance of pumps and working efficiency.

18. Engineering Geology Lab

Course Name: (Engineering Geology Lab -PC453BS)	
C01	Understands the method and ways of investigations required for Civil Engg projects
C02	Identify the various rocks, minerals depending on geological classifications
C03	Will able to learn to couple geologic expertise with the engineering properties of rock
C04	Will able to learn to unconsolidated materials in the characterization of geologic sites for civil work projects
C05	Will able to learn to the quantification of processes such as rock slides and settlement

19. Surveying Camp

Course Name: (Surveying Camp-ES451CE)	
C01	Gain the practical knowledge on calculation of an area, volume of an irregular and regular land surface using chain & tape.
C02	Operate different types of instruments in surveying. Perform leveling and contouring at ground surfaces.
C03	Apply knowledge of mathematics in surveying field to calculate areas and volume for different projects.
C04	Utilize total station and other modern survey instrument.
C05	Apply the principle of surveying for civil Engineering Applications

Department of Civil Engineering
III YEAR I SEMESTER

S. No.	Course Code	Course Title
1	PC3101CE	Professional Practice, Building Laws & Ethics
2	HS3102LA	Law and Engineering
3	PC3103CE	Soil Mechanics
4	PC3104CE	Water Resource Engineering
5	PC3105CE	Theory of Structures
6	PC3106CE	Concrete Technology
7	MC3107CE	Disaster Management
8	PC3108CE	Soil Mechanics Lab
9	PC3109CE	Concrete Technology Lab

III YEAR II SEMESTER

S. No.	Course Code	Course Title
1	PC3201 CE	Environmental Engineering
2	PC3202 CE	Design of Steel Structures
3	PC3203 CE	Foundation Engineering
4	PC3204CE	Transportation Engineering
5	PE-I*	Professional Elective-I
6	PE- II**	Professional Elective-II
7	PE- III**	Professional Elective-III
8	PE3211CE	Green Building Technology
9	PC3213 CE	Environmental Engineering lab
10	PC3214 CE	Transportation Engineering Lab

1. Professional Practice, Building laws & Ethics

Course Name: (Professional Practice, building laws & Ethics-HS310LA)	
C01	Understanding basic purpose of Professional Practice and Ethic on, professional ethics and various moral and social Issues
C02	Awareness of Law of Contract
C03	Arbitration, Conciliation and ADR (Alternative Dispute Resolution) system
C04	Role of Labor in Civil Engineering
C05	Law relating to Intellectual property

2. Soil Mechanics

Course Name: (Soil Mechanics -PC3103CE)	
C01	Understand the mechanism behavior of soil for different loads
C02	Analyze the properties and factors of permeability
C03	Evaluate the various stress distribution of soils
C04	Understand the principles of compaction and its control., Compute and analyze the consolidation settlements
C05	Identify shear strength parameters for field conditions

3. Water Resources Engineering

Course Name:(Water Resources Engineering - PC3104CE)	
C01	Analyze hydro-meteorological data
C02	Estimate abstractions from precipitation
C03	Compute yield from surface and subsurface basin
C04	Develop rainfall-runoff models
C05	Formulate and solve hydrologic flood routing models

4. Structural Analysis - I

Course Name: (Structural Analysis - I -PC3105CE)	
C01	Analyze Perfect, Imperfect and Redundant Frames
C02	Formulate Equilibrium and compatibility equations for structural members
C03	Analyze the beam by using moment distribution method.
C04	Analyze indeterminate structures
C05	Analyze structures for gravity loads, moving loads and lateral loads

5. Concrete Technology

Course Name: (Concrete Technology -PC3106CE)	
C01	Understand the basic physical & chemical properties of cement and admixtures.
C02	Understand the mechanical properties of aggregates.
C03	Describe the properties and factors influencing the work ability of fresh concrete.
C04	Determine the effect of W/C ratio on the strength of hardened concrete & also the strength of concrete by using NDT testing methods.
C05	Analyze the mix design of concrete

7. Soil Mechanics Lab

Course Name: (Soil Mechanics Lab –PC3108CE)	
C01	Determine index properties of soils
C02	Classify soils
C03	Determine engineering properties of soils
C04	Determine the coefficient of consolidation
C05	Determine the shear strength parameters of soil

8. Concrete Technology Lab

Course Name: (Concrete Technology Lab –PC3109CE)	
C01	To Understand the Properties of concrete materials and behavior of concrete
C02	To Understand the concept of fresh concrete
C03	To Understand the properties hardened concrete
C04	Design and test concrete mix
C05	Conduct Non-destructive tests on concrete

10. Environmental Engineering

Course Name: (Environmental Engineering –PC3201CE)	
C01	Analyze characteristics of water and wastewater
C02	Estimate the quantity of drinking water and domestic wastewater generated
C03	Design components of water supply systems and design sewerage system
C04	Design skimming tank, grit chambers, sedimentation tanks, septic tank and sludge digestion tank.
C05	Ability to analyze, examine different physical, chemical and biological properties of water

11. Design of Steel Structures

Course Name:(Design of Steel Structures –PC3202CE)	
C01	Design tension and compression members
C02	Design beams and beam columns
C03	Design bolt and weld connections
C04	Design built up members and column base
C05	Design of plate girders and roof trusses

12. Foundation Engineering

Course Name: (Foundation Engineering – PC3203CE)	
C01	Analyze the of need and methods of soil exploration
C02	Ability to learn the field test and soil investigation
C03	Apply knowledge for stability of slopes of earth dams under different conditions.
C04	Students should be able to understanding earth pressure theories and design of retaining walls, concept of allowable bearing pressure, safe bearing capacity
C05	Ability to learn the theory of shallow foundation

13. Transportation Engineering

Course Name: (Transportation Engineering – PC3204CE)	
C01	Understand the plan and highway network
C02	Design of highway geometric
C03	Understand the traffic engineering parameters & its regulation
C04	Understand the patterns of interaction design
C05	Design of flexible and rigid pavements

14. Design of Irrigation Structures

Course Name:(Design of IrrigationStructures-PE3205CE)	
C01	Plan and irrigation system
C02	Analyze and design gravity dams
C03	Design earthen dams, spillways and energy dissipations works
C04	Plan and design diversion head works
C05	Design irrigation canal structures.

15. Ground Improvement Techniques

Course Name: (GroundImprovementTechniques-PE3209CE)	
C01	Classify the field problems related to problematic soils
C02	Explain the ground improvement techniques like vibro compaction
C03	Design the drainage & dewatering system for the field problems
C04	Classify physical and chemical modification

16. Prestressed Concrete

Course Name: (Prestressed Concrete - PE3212CE)	
C01	Understand the principles of & necessity of prestressed concrete structures
C02	Acquire the knowledge of various prestressing techniques
C03	Develop skills in design of prestressed concrete members as per IS code
C04	Understand analysis and design of prestressed concrete members
C05	Analysis and design of composite beams

17. Environmental Engineering Lab

Course Name: (Environmental Engineering Lab -PC3213CE)	
C01	Categorize the different physical, chemical & biological properties of water
C02	Find the PH in given water sample.
C03	Find the chemicals content in water sample.
C04	Determine the alkalinity & acidity the water sample.
C05	Determine the optimum coagulant dose in water treatment.

18. Transportation Engineering Lab

Course Name: (Transportation Engineering Lab -PC3214CE)	
C01	Identify the properties and behavior of highway material for different loading patterns.
C02	Understand the properties of highway material by conducting specific gravity & water absorption.
C03	Understand techniques to characterize various pavement material through relevant test.
C04	Understand the different types of traffic studies.
C05	Able to understand the types of parking studies.

Department of Civil Engineering
IV YEAR I SEMESTER

S. No.	Course Code	Course Title
1	PC4101CE	Estimation, Costing and Project Management
2	PECIV*	Professional Elective-IV
3	PECV*	Professional Elective-V
4	PECVI*	Professional Elective-VI
5	OE I	Open Elective-I
6	PW4115CE	PROJECTWORKPART A
7	PC4116CE	Computer Aided Building Lab

IV YEAR II SEMESTER

S. No.	Course Code	Course Title
1	PECVII*	Professional Elective-VII
2	PC4204CE	Computer Aided Design and Drafting Lab
3	PW4205CE	PROJECTWORKPART B
4	OEII*	Open Elective
5	MC	Mandatory Non-Credit course

1. Estimation, Costing and Specification

Course Name: (Estimation, Costing and specification-PC4101CE)	
C01	Understand the different types of estimates and prepare detailed estimate
C02	Estimate bar requirement for different RC elements and the earthwork quantities for roads and canals
C03	Evaluate the rates for various items of work in the rate analysis
C04	Apply standard specifications, prepare contract documents and evaluate the valuation of building
C05	Understand the construction project planning and networks

2. Road Safety Engineering

Course Name: (Road Safety Engineering-PE4104CE)	
C01	Understand the fundamentals of traffic safety analysis
C02	Analyze Accident data
C03	Remember the concepts of road safety in urban transport
C04	Apply crash reduction techniques
C05	Design of urban Infrastructure considering safety aspects

3. Rehabilitation and Retrofitting of Structures

Course Name: (Rehabilitation and Retrofitting of Structures -PE4105CE)	
C01	Recognize the mechanism of deterioration of structures and various maintenance.
C02	Able of examine the damages occurred in reinforced concrete building.
C03	Evaluate the existing buildings through field investigations.
C04	Understand and use the different techniques for repairs and structural retrofitting.
C05	Adopt methods in health monitoring of structures.

4. Ground Water Development and Management

Course Name: (Ground Water Development and Management -PE4109CE)	
C01	Understand ground water occurrence
C02	Understand Water Movement
C03	Evaluate groundwater resources using geophysical methods
C04	Model regional groundwater flow
C05	Design water wells

5. Basic Materials Science and Engineering

Course Name: (Basic Materials Science and Engineering-OE4113ME)	
C01	Understand the importance of Material Selection
C02	Correlate the microstructure, properties, processing and performance of materials.
C03	Select metal/alloy for engineering applications
C04	Discuss the characteristics and applications of metals and alloys
C05	Understand the importance of Material Selection

6. Computer Aided Building Lab

Course Name : (Computer Aided Building Lab –PC4116CE)	
C01	Use the AutoCAD commands for drawing 2D & 3D building drawings required for different civil engg applications.
C02	Plan and draw Civil Engineering Buildings as per aspect and orientation
C03	Presenting drawings as per user requirements and preparation of technical report
C04	Able to prepare a layout to be plotted.
C05	Able to draw the different drawings required for civil engineering application & to communicate with each other by the means of civil engineering drawing.

6. ProjectWork-A

Course Name: (Project Work A - PW4115CE)	
C01	Able to make comprehensive use of the technical knowledge gained from previous courses
C02	Able to understand equipment usage in the laboratories concerned with the project
C03	Able to apply project management skills (scheduling work, procuring parts and documenting expenditures and working within the confines of a deadline).
C04	Able to analyze, develop and demonstrate methodology used for the experiments for the concerned projects in civil Engineering
C05	Able to communicate technical information by means of written and oral reports

7. Advanced Concrete Technology

Course Name: (Advanced Concrete Technology – PE4201CE)	
C01	Understand the basic physical & chemical properties of cement and admixtures.
C02	Understand the properties of special concretes.
C03	Describe the properties and factors influencing the work ability of fresh concrete.
C04	Determine the effect of W/C ratio on the strength of hardened concrete & also the strength of concrete by using NDT testing methods.
C05	Analyze the mix design of concrete

8. Computer Aided Design and Drafting Lab

Course Name: (Computer Aided Design and Drafting Lab –PC4204CE)	
C01	Detailing of reinforcement in Cantilever, simply supported and continuous beams
C02	Detailing of reinforcement in canopy & columns
C03	Detailing of reinforcement in RC isolated footings square, one-way to two-way slabs, rectangular, circular and combined footings, dog-legged staircases
C04	Drawing of steel bolted, welded connections, steel compression and tension members
C05	Drafting of steel beams-built-up sections, steel plate girder and steel roof truss

9. Project Work-B

Course Name: (Project Work-B PW4205CE)	
C01	Able to make comprehensive use of the technical knowledge gained from previous courses
C02	Able to understand equipment usage in the laboratories concerned with the project
C03	Able to apply project management skills (scheduling work, procuring parts and documenting expenditures and working within the confines of a deadline).
C04	Able to analyze, develop and demonstrate methodology used for the experiments for the concerned projects in civil Engineering
C05	Able to communicate technical information by means of written and oral reports

10. Non-conventional Energy Sources

Course Name: (Non-conventional Energy Sources – OE4201EE)	
C01	Demonstrate the generation of electricity from various non-conventional sources of energy having a working knowledge on types of fuel cells.
C02	Estimate the solar energy, utilization of it. principles involved in solar energy collection and conversion of it to electricity generation.
C03	Explore the concepts involved in wind energy. And types
C04	By studying wind energy conversion system and its components
C05	Acquire the knowledge on geothermal energy