COLLEGE OF ENGINEERING ROORKEE

Department of Civil Engineering

Course Name: Construction Materials **Course Code: BCET 302**
Year of Study: II **Semester: III**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the typical and potential applications of construction materials	Understand	B.L 1
CO 2	Understand the relationship between material properties and structural form	Understand	B.L 1
CO 3	Analyze the experimental verification of material properties	Analyze	B.L 3
CO 4	Understand concepts related Concrete technology which involves types and property of concrete and different materials.	Understand	B.L 1
CO 5	Perform concrete mix design as per IS code guidelines.	Apply	B.L 2

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Department of Civil Engineering

Course Name: Surveying **Course Code: BCET 303**

Year of Study: II **Semester: III**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the basic principles of surveying for Vertical, horizontal, Linear and Angular measurements to arrive at solutions to basic surveying problems.	Understand	B.L-1
CO 2	Understanding leveling (auto level, theodolite) and using it in field of construction. Further draw contours to represent 3D data on plane figures.	Apply	B.L-2
CO 3	Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments.	Analyze	B.L-3
CO 4	Design and implement the different types of curves for deviating type of alignments. And applying surveying techniques to align highway and railway curves.	Create	B.L-4
CO 5	Analyze type of survey operation required for problem solving in field	Analyze	B.L-3

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Department of Civil Engineering

Course Name: Building Planning & Architecture **Course Code: BCET 304**

Year of Study: II **Semester: III**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Learn building components, principles, methods, software's and codes of practices for planning and design of the building.	Understand	B.L-1
CO 2	Apply knowledge of various building components and services to the design and construction of the buildings.	Apply	B.L-2
CO 3	Prepare constructional detailed representation drawing of a building on paper.	Create	B.L-5
CO 4	Analyze the planning laws and recommendations involved in planning, building drawings and architectural concepts of buildings given by the concerned authorities.	Analyze	B.L-3
CO 5	Design the different plans of different types of buildings components and to understand the drawing principles involved in the design.	Evaluate	B.L-4

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Strength of Materials **Course Code: BCET 305**

Year of Study: II **Semester: III**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials.	Understand	B.L-1
CO 2	Apply knowledge of mathematics, science, for engineering applications and ability to identify, formulates, and solves engineering &real-life problems.	Apply	B.L-2
CO 3	Analyze and design structural members subjected to tension, compression, torsion, bending and combined stresses using the fundamental concepts of stress, strain and elastic behavior of materials.	Analyze	B.L-4
CO 4	Analyze S.F.D, B.M.D and Deflection of simply supported, Cantilever, over-hanged Beams.	Analyze	B.L-3
CO 5	Build the necessary understanding and theoretical background for further structural analysis.	Create	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COLLEGE OF ENGINEERING ROORKEE

Course Name: Energy & Environmental Engineering

Course Code: BCET 401

Year of Study: II Semester: IV

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand tools and techniques relevant to the energy and energy-related environmental disciplines along with an understanding of their processes and limitations.	Understand	B.L-1
CO 2	Apply advanced level knowledge, techniques, skills and modern tools in the field of Energy and Environmental Engineering.	Apply	B.L-2
CO 3	Understand energy resources and types, technologies and systems, energy management fundamentals, and technological intervention towards the present and potential future energy.	Understand	B.L-1
CO 4	Respond to global policy initiatives and meet the emerging challenges with sustainable technological solutions in the field of energy and environment.	Evaluate	B.L-4
CO 5	Understand the different energy generation systems and their environmental impacts.	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Construction Technology **Course Code: BCET 402**

Year of Study: II **Semester: IV**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand concepts related Concrete technology which involves types and property of concrete and different materials.	Understand	B.L-1
CO 2	Describe the properties and factors influencing the workability of fresh concrete.	Analyze	B.L-3
CO 3	Understand the behavior of fresh and hardened concrete by understanding composition of various types of concrete and various tests performed on concrete.	Understand	B.L-1
CO 4	Analyze the need for special concretes by involving basic chemistry of Fly ash, Plasticizer, Retarder, etc	Analyze	B.L-3
CO 5	Apply the basic concepts and applications of special concretes at various situations.	Apply	B.L-2

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: **Structural Analysis I** **Course Code: BCET 403**

Year of Study: II **Semester: IV**

Course Outcomes: The student will be able to:

	Course Outcomes	**Bloom's Taxonomy**	**Bloom's Level (B.L)**
CO 1	Compute internal forces and deflections in trusses and frames, and classify frames.	Evaluate	B.L-4
CO 2	Analyze beams and trusses under moving loads using influence lines diagram	Analyze	B.L-3
CO 3	Evaluate horizontal thrust, radial shear and bending moment of three hinged and two hinged arch	Evaluate	B.L-4
CO 4	Learn about behavior of suspension cable under various loading systems	Understand	B.L-1
CO 5	Apply basic energy principles to determinate structures	Apply	B.L- 2

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Department of Civil Engineering

Course Name: Transportation Engineering- I **Course Code: BCET 404**

Year of Study: II **Semester: IV**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand detailed history of road development & twenty years road plan	Understand	B.L 1
CO 2	Understand the factors influencing road vehicle performance characteristics and design and apply basic science principles in estimating stopping and passing sight distance requirements.	Understand	B.L 1
CO 3	Understand the properties of the highway material, their testing and change in behavior in influence to changing climatic parameters. Study horizontal and vertical alignment, including super elevation, which comply standards as per IRC	Evaluate	B.L 4
CO 4	Understand the relationship between the environment and transportation infrastructure and the importance of traffic engineering in real life problems.	Understand	B.L 1
CO 5	Design rigid and flexible pavements which comply with IRC: 37 standards, and factor influencing their maintenance.	Create	B.L 5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Engineering Geology & Remote Sensing

Course Code: BCET 405

Year of Study: II Semester: IV

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Identify different type of rocks, minerals and building stones.	Analyze	B.L-3
CO 2	Apply geologic concepts and approaches on rock engineering projects.	Apply	B.L-2
CO 3	Understand the structural geology terms like dip, strike, joints and learn about the groundwater and methods to recharge them.	Understand	B.L-1
CO 4	Know about the geological investigations for the site selection.	Evaluate	B.L-4
CO 5	Understand natural hazards like earthquakes and tsunamis, their causes and prevention	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Cyber Security **Course Code: BCST 408**

Year of Study: Second Year **Semester: IV**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understanding of the concepts and foundations of computer security, and identify vulnerabilities of IT systems.	Understand	B.L-1
CO 2	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.	Apply	B.L 2
CO 3	Principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics Software/tools.	Analyze	B.L-3
CO 4	Analyze software vulnerabilities and security solutions to reduce the risk of exploitation, Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators.	Analyze	B.L-3
CO 5	Design and develop security architecture for an organization and operational and strategic cyber security strategies and policies. Evaluate the cyber security needs of an organization.	Create	B.L-5
CO 6	Use basic security tools to enhance system security and can develop basic security enhancements in stand-alone applications.	Apply	B.L-2

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COLLEGE OF ENGINEERING ROORKEE

Course Name: Design of RC Elements Course Code: BCET 501

Year of Study: III Semester: V

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Learn the properties of concrete used for construction of structural elements and overall structure.	Understand	B.L-1
CO 2	Learn the various analysis methods (working stress and limit state methods)	Analyze	B.L-4
CO 3	Learn the concept of shear, bond, and anchorage and development length.	Understand	B.L-1
CO 4	Learn designing of various structural elements such as beam, column, one way and two way slabs and footing.	Create	B.L-5
CO 5	Learn stability analysis of retaining wall, design of retaining wall.	Create	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Geotechnical Engineering I **Course Code: BCET 502**
Year of Study: III **Semester: V**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the different types of soils, basic properties and its importance in geotechnical engineering.	**Understand**	B.L-1
CO 2	Solve any practical problems related to soil stresses estimation, permeability and seepage including flow net diagram.	**Evaluate**	B.L-4
CO 3	Solve practical problems related to consolidation settlement and time rate of settlement.	**Evaluate**	B.L-4
CO 4	Evaluate the shear strength of soils, earth pressure and stability of retaining walls.	**Evaluate**	B.L-4
CO 5	Analyze the stability of slopes and evaluate the stress distribution in soils.	**Analyze**	B.L-4

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Fluid Mechanics **Course Code: BCET 503**

Year of Study: III **Semester: V**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the broad principles of fluid statics, kinematics and dynamics and basic terms used in fluid mechanics.	Understand	B.L-1
CO 2	Able to understand and explain fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, etc.	Understand	B.L-1
CO 3	Have the fundamental knowledge of fluid, its properties and behaviour under various conditions of internal and external flows.	Analyze	B.L-3
CO 4	be able to apply the continuity, momentum and energy principles on problems of fluid mechanics.	Apply	B.L-2
CO 5	Determine the losses in a flow system, flow through pipes, boundary layer flow and flow past immersed bodies.	Evaluate	B.L-4

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Structural Analysis II **Course Code: BCET504(A)**

Year of Study: III **Semester: V**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Utilize mathematical tools learned in prerequisite courses to set up and solve relevant engineering problems	Apply	B.L-2
CO 2	Identify the internal forces and moments in beams to develop shear force and bending moment diagrams,	Evaluate	B.L-4
CO 3	Analyze continuous beam using Three Moment Method	Analyze	B.L-3
CO 4	Analyze continuous beams and frames using displacement methods and force methods.	Analyze	B.L-3
CO 5	Learn plastic behavior of structural systems under various loadings	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Transportation Engineering II **Course Code: BOET505 (B)**

Year of Study: III **Semester: V**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Remember the relationship between key materials and their properties along with the behaviour of pavement component systems.	Understand	B.L-1
CO 2	Characterize traffic loads for pavement design and analysis.	Analyze	B.L-3
CO 3	Understand pavement construction procedures; and Design flexible and rigid pavements, joint behaviour, design concept.	Understand	B.L-1
CO 4	Understand the principles of construction and maintenance of highway.	Understand	B.L-1
CO 5	Apply the various traffic characteristics and analysis and use the data for road design	Apply	B.L-2

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Design of RC Structures **Course Code: BCET 601**

Year of Study: III **Semester: VI**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Perform analysis of reinforced concrete members and connections	Analyze	B.L-2
CO 2	Perform design of reinforced concrete members and connections	Evaluate	B.L-4
CO 3	Identify and interpret the appropriate relevant industry design codes	Apply	B.L-2
CO 4	Become familiar with professional and contemporary issues in the design and fabrication of reinforced concrete members.	Understand	B.L-1
CO 5	Understand the properties and role of various constituent materials used in concrete making and the theory and principles of design and solution of Reinforced Concrete structures	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Environmental Engineering –I **Course Code: BCET 602**

Year of Study: III **Semester:** VI

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Identify the source of water and water demand and the water treatment concept.	Understand	B.L-1
CO 2	Select the treatment to raw water with suitable intake with usefulness for domestic and construction purpose.	Apply	B.L-2
CO 3	Plan and implement plumbing work and laying the pipe-network for water supply disposal effectively.	Create	B.L-5
CO 4	Check physicochemical parameters of raw water as per the standards.	Analyze	B.L-3
CO 5	Understand the different methods used to calculate water demands.	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Open Channel Flow **Course Code: BCET 603**

Year of Study: III **Semester:** VI

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand and apply the fundamental principles governing open channel hydraulics to the design of engineering systems.	Understand	B.L-1
CO 2	Able to solve open channel flow problems through the selection and use of appropriate equations.	Evaluate	B.L-4
CO 3	Ability to explain the physical mechanisms of hydraulic jumps, surges, and critical, uniform, and gradually-varying flows.	Analyze	B.L-3
CO 4	Apply mathematical relationships and problems involving weir or notches, hydraulic jumps, surges, and critical, uniform, and gradually-varying flows.	Evaluate	B.L-4
CO 5	Learn the various types of open channel flow and their characteristics.	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Geotechnical Engineering II **Course Code: BCET 604(A)**

COER
COLLEGE OF ENGINEERING ROORKEE

Year of Study: III Semester**: VI**

Course Outcomes: The student will be able to:

	Course Outcomes	**Bloom's Taxonomy**	**Bloom's Level (B.L)**
CO 1	Understand the different types of shallow foundations and evaluate the bearing capacities and settlement of the same.	Evaluate	B.L-4
CO 2	Understand the need for pile foundation and evaluate the bearing capacity and settlement of the same.	Evaluate	B.L- 4
CO 3	Understand the methods of construction of well foundation and analyses its strength and stability.	Analyze	B.L-3
CO 4	Understand the types of machine foundation and apply the mathematical models to check its stability.	Apply	B.L-2
CO 5	Understand the purpose of soil investigation, soil exploration program, soil exploration methods and soil identification in the field.	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Principles of Management **Course Code**: **BCET 605(A)**

COER
COLLEGE OF ENGINEERING ROORKEE

Year of Study: III **Semester: VI**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Identify the different types of principles of management.	Understand	B.L-1
CO 2	Discuss and communicate the management evolution and how it will affect future managers.	Analyze	B.L-3
CO 3	Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.	Evaluate	B.L-4
CO 4	Explain how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.	Understand	B.L-1
CO 5	Practice the process of management's four functions: planning, organizing, leading, and controlling.	Apply	B.L-2

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Bridge Engineering **Course Code: TCE 701**

COER
COLLEGE OF ENGINEERING ROORKEE

Year of Study: IV **Semester: VII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Discuss basic definitions, types and components of bridges and perform hydraulic calculations.	Understand	B.L-1
CO 2	Discuss Sub surface investigations required for bridge constructions and load distribution.	Analyze	B.L-3
CO 3	Understand standard specification for bridge design that helps in analysis of the bridges.	Understand	B.L-1
CO 4	Design of various slab type reinforced concrete bridges, Steel bridges and cable bridges.	Create	B.L-5
CO 5	Perform design of bridges sub-structure, bearings and joints.	Create	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Transportation Engineering II **Course Code: TCE 702**

COER
COLLEGE OF ENGINEERING ROORKEE

Year of Study: IV **Semester: VII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the importance of railway infrastructure planning and design	Understand	B.L-1
CO 2	Identify the factors governing design of railway infrastructures	Understand	B.L-1
CO 3	Prepare structural designs of runway, taxiway and apron-gate area.	Create	B.L-5
CO 4	Design and analyze the railway track system	Analyze	B.L-3
CO 5	Prepare master plans for Airports and Railway track considering railway airport elements	Create	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Seismology and Earthquake Engineering

Course Code: TCE 703

Year of Study: IV Semester: VII

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Identify and understand engineering concepts which are applied in field of earthquake engineering.	Understand	B.L-1
CO 2	Apply basic principles and importance of structural dynamics and earthquake in civil engineering applications.	Apply	B.L-2
CO 3	Evaluate the effects of vibrations in structures that are subjected to vibratory conditions, and compute design response spectra.	Evaluate	B.L-4
CO 4	Analyze the free and forced (harmonic, periodic, non-periodic) vibration of single and multi-degree of freedom linear systems.	Analyze	B.L-3
CO 5	Understand the application of scientific and technological principles of planning, analysis, design of buildings according to earthquake design philosophy.	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Hydraulic Structures Course Code: TCE705

COER
COLLEGE OF ENGINEERING ROORKEE

Year of Study: IV **Semester: VII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the concept of different types of Hydraulic Structures and their types, purposes and design.	Understand	B.L-1
CO 2	Explain the profile of dams, distinguish the types of dams and Apply the concepts and the knowledge in checking the stability of dam against overturning and sliding.	Apply	B.L-2
CO 3	Understand the types of spillways, gates and other terminal structures associated with the hydropower plant.	Understand	B.L-1
CO 4	Evaluate the different canal regulation wok, Cross drainage work, Dam failures and adapt the preventive measures.	Evaluate	B.L-4
CO 5	Design and plan the various appurtenances used in Hydro project.	Create	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Air &Water Pollution **Course Code: TCE707**

COLLEGE OF ENGINEERING ROORKEE

Year of Study: IV **Semester: VII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Learn about the different types and sources of pollution and the various human activities that can cause pollution.	Understand	B.L-1
CO 2	Classify and Compare various controls methods and equipment's for air pollution to reduce its impact on environment.	Analyze	B.L-3
CO 3	Have understanding of the concepts of air pollution and reasoning of the entire episode, identification of the parameters, conditions, and mechanisms.	Understand	B.L-1
CO 4	Analyze the concepts and planning involved in pollution control technologies	Analyze	B.L-3
CO 5	Interpret pollution data and develop capability to assessment of project proposal, air quality pollution index for any region.	Create	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Hydropower Engineering **Course Code: TCE801**

COER
COLLEGE OF ENGINEERING ROORKEE

Year of Study: IV **Semester: VIII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the concept of Hydropower, types, methods and procedure to plan and design a hydropower schemes.	Understand	B.L-1
CO 2	Apply the concepts and aspects of types, design, Location, components Structures involved in a Hydropower plant.	Apply	B.L-2
CO 3	Have the knowledge of different types of Hydropower Schemes and their purposes.	Understand	B.L-1
CO 4	Estimate and study the preliminary flow data to evaluate the power to be generated by the proposed hydropower plant.	Evaluate	B.L-5
CO 5	Evaluate the different design techniques of various components – conveyance structures, intakes, Turbines etc. and to use these techniques in designing the power plant.	Evaluate	B.L-5

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

Department of Civil Engineering

Course Name: Construction Planning and Management

COLLEGE OF ENGINEERING ROORKEE

Course Code: TCE 804

Year of Study: IV **Semester: VIII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Understand the roles and responsibilities of a project manager	Understand	B.L-1
CO 2	Prepare schedule of activities in a construction project	Create	B.L-5
CO 3	Prepare tender and contract document for a construction project	Create	B.L-5
CO 4	Identify the equipment used in construction	Understand	B.L-1
CO 5	Analyze critical path and resource allocation, towards the end of the course	Analyze	B.L-3

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Advanced Highway Engineering Course Code: TCE 806

Year of Study: IV **Semester: VIII**

Course Outcomes: The student will be able to:

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Classify rural and urban roads and understand different Road patterns.	Understand	B.L-1
CO 2	Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes	Analyze	B.L-3
CO 3	Understand and analyze flexible pavements with IRC: 37 standards, and factor influencing their maintenance.	Analyze	B.L-3
CO 4	Understand and analyze rigid pavements	Analyze	B.L-3
CO 5	Evaluate pavement techniques to study and analyze deflection of pavements, and methods of stabilization.	Evaluate	B.L-4

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)

COER
COLLEGE OF ENGINEERING ROORKEE

Course Name: Environmental Management & Sustainable Development

Course Code: TCE 808

Year of Study: IV Semester: VIII

Course Outcomes: The student will be able to

	Course Outcomes	Bloom's Taxonomy	Bloom's Level (B.L)
CO 1	Identify the scope and relationship between the energy, environment and economy from the point of view the Infrastructure.	Understand	B.L-1
CO 2	Understand the concept of ecology and sustainable engineering.	Understand	B.L-1
CO 3	Understand the measures and remedies of the Environmental Impact Management.	Analyze	B.L-3
CO 4	Understanding of the laws, ethics and social responsibility of Environmental Legislations.	Understand	B.L-1
CO 5	Understanding of Sustainable development in Global context of climate change and developing technology.	Understand	B.L-1

B.L – Bloom's Taxonomy Levels
(1- Understand, 2 – Apply, 3 – Analyze, 4 – Evaluate, 5 - Create)