Department of Civil Engineering

SEMESTER - III

NAME OF COURSE:		**SURVEYING & GEOMATICS**	
COURSE CODE:	**CV31**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. PPW**

CV31.1	Carry out temporary adjustments of modern surveying equipments.
CV31.2	Use the surveying instruments namely levels, theodolite, EDM, total station for surveying measurements such as horizontal/ vertical/inclined distance, horizontal/ vertical angles, bearings, reduced levels, and coordinates
CV31.3	Develop plans, draw maps and draft reports for surveying projects of Civil Engineering works
CV31.4	Use the modern surveying techniques namely remote sensing, Global positioning system and Geographic information system for Civil Engineering applications.
CV31.5	Demonstrate the attributes of leadership, working in the team and professional ethics while performing the surveying projects.

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Department of Civil Engineering

NAME OF COURSE:		**FLUID MECHANICS AND FLUID MACHINES**	
COURSE CODE:	**CE32**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CE32.1	Identify and obtain values of fluid properties and relationship between them
CE32.2	Carry out calibration of discharge measuring equipments.
CE32.3	Carry out hydraulic design of notched, weirs and spillways
CE32.4	Analyze fluid flows and will be able to design pipe networks
CE32.5	Explain the working of Pelton, Francis and Kaplan turbines and pumps along their performance parameters.
CE32.6	Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics.

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Department of Civil Engineering

NAME OF COURSE:		**CONCRETE TECHNOLOGY, MATERIAL TESTING & EVALUATION**	
COURSE CODE:	**CE33**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CE33.1	Perform laboratory testing of various ingredients of concrete for determining their physical properties
CE33.2	Explain properties of fresh and hardened concrete and apply this knowledge on field.
CE33.3	Select appropriate type of concrete, admixture and chemicals for specific requirements
CE33.4	Design a concrete mix of required strength and durability, for given field conditions, using suitable ingredients
CE33.5	Evaluate properties of construction materials viz. steel, bricks, timber, tiles etc.in laboratory for the quality assurance

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Department of Civil Engineering

NAME OF COURSE:		**STRUCTURAL MECHANICS-I**	
COURSE CODE:	**CE35C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VMG**

Course Outcomes:

CE35C.1	Employ the knowledge of structural mechanics to depict the behavior of structures.
CE35C.2	Identify principal planes and find principal stresses in beams and effect of combined bending and torsion
CE35C.3	Identify all potential failure modes of an item
CE35C.4	Draw Shear force diagrams and bending moment diagrams of statically determinate beams.
CE35C.5	Evaluate bending and shear stresses in beams.
CE35C.6	Analyse the behavior of structure under moving load using Influence line diagrams

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NAME OF COURSE:		**LAB PRACTICE**	
COURSE CODE:	**CE410 L**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. MDL**

Course Outcomes:

CE410 L.1	Architectural floor plan of a small residential building
CE410 L.2	The geometric constructions, multi-view, sectional view, dimensioning and detail drawings of typical 2-D engineered objects.
CE410 L.3	Views like elevation, section, furniture plan for a small residential building
CE410 L.4	Detailed formatted and dimensioned Civil Engineering drawings.

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Department of Civil Engineering

NAME OF COURSE:		**ENVIRONMENTAL ENGINEERING-1**	
COURSE CODE:	**CE41**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. KCM**

Course Outcomes:

CE41.1	1. Plan and design water conveyance systems for a rural/urban area based on population forecasts
CE41.2	2. Design various water treatment units and plan their operations on the basis of raw water quality and water demand.
CE41.3	3. Apply knowledge of advanced water treatment processes for individual water purification units.
CE41.4	4. Plan and design water distribution systems and identify operation and maintenance problems in water supply systems and suggest suitable solutions.

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NAME OF COURSE:		**BUILDING PLANNING & DESIGN**	
COURSE CODE:	**CE42**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CE42.1	Plan residential and public buildings, according to the prevalent building byelaws
CE42.2	Prepare „Municipal building permission drawings" of residential buildings using CADD software tool
CE42.3	Plan appropriate building services for a building
CE42.4	Design a rain water harvesting system for a building
CE42.5	Plan appropriate acoustics, sound insulation and fire fighting arrangements for a building

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NAME OF COURSE:		**STRUCTURAL MECHANICS-II**	
COURSE CODE:	**CE43**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VMG**

Course Outcomes:

CE43.1	Employ the knowledge of structural mechanics to describe the behavior of structures under combined direct and bending and also behavior of long columns.
CE43.2	Evaluate slope and deflection in beams and analysis of 3 hinged arch
CE43.3	Analyze determinate and indeterminate structural members subjected to different types of loadings.
CE43.4	Discretize simple structures; identify static and kinematic degrees of freedom
CE43.5	Analyze beams, trusses and frames for joint displacements, and forces in members, by force method and displacement method
CE43.6	Select and use appropriate application software for structural analysis

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NAME OF COURSE:		**ENGINEERING MATHEMATICS – III**	
COURSE CODE:	**CE44**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SRK**

Course Outcomes:

CE44.1	Solve higher order linear differential equation with constant coefficient
CE44.2	Solve partial differential equation of first order
CE44.3	Express a function in terms of sine and cosine components so as to model simple periodic functions
CE44.4	Apply Laplace and inverse Laplace transforms for solving linear differential equations.
CE44.5	Find the relation between two variables for the given data using regression
CE44.6	Sketch and explain various probability distribution functions

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NAME OF COURSE:		**ENGINEERING GEOLOGY**	
COURSE CODE:	**CE45**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. KCM**

Course Outcomes:

CE45.1	To describe issues concerning the geological formations and geological structure of a region.
CE45.2	To distinguish the characteristics of the most important geological formations and problems that may arise in the various civil engineering projects in such formations.
CE45.3	To interpret and explain the geological structures in the geological maps and cross sections.
CE45.4	To assess and appropriately adjust the results of geological study in order to ascertain secure construction and operation of a civil engineering projects like dams, reservoirs hilly roads and railway tracks.
CE45.5	To receive, analyze and evaluate data and appropriately and solve technical as well as ground water related problems.

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NAME OF COURSE:		**COMPUTER PROGRAMMING & NUMERICAL METHODS**	
COURSE CODE:	**CE48**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**S.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SHL**

Course Outcomes:

CE48.1	Various Civil Engineering Problems
CE48.2	Matrix operations, which are necessary for structural analysis.
CE48.3	Calculating Roots of equation, Numerical Integration, ordinary differential equations and their various applications in Civil Engineering.
CE48.4	Carrying out statistical analysis of data for various statistical methods, with applications from Civil Engineering domain

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SEMESTER - V

NAME OF COURSE:		**DESIGN OF STEEL STRUCTURES**	
COURSE CODE:	**CE51C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VMG**

Course Outcomes:

CE51C.1	Understand the Philosophy and design criteria, Select appropriate load combinations for 'Limit State' design of various elements of steel structures for strength and serviceability
CE51C.2	Analyze and design simple connections between structural members including Bolted and welded connections
CE51C.3	Analyze and design Tension members, Compression members, and their connections.
CE51C.4	Analyze and design of flexural members by limit state method.
CE51C.5	Plastic analysis of (flexural members) beams.
CE51C.6	Design Columns, Column base (slab base, gusseted base) for given loading conditions.

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NAME OF COURSE:		**GEOTECHNICAL ENGINEERING**	
COURSE CODE:	**CE52C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CE52C.1	Determine various index properties of soil in the laboratory to characterize and classify the soil.
CE52C.2	Estimate the permeability and seepage through soil mass by applying basic hydraulic flow principles.
CE52C.3	Draw stress contours in soil mass by applying stress distribution theory.
CE52C.4	Determine shear strength parameters of soil under various drainage conditions
CE52C.5	Determine compaction properties and consolidation settlement of soil for given loading conditions.
CE52C.6	Determine earth pressure for earth retaining structure.

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NAME OF COURSE:		**HIGHWAY AND TUNNEL ENGINEERING**	
COURSE CODE:	**CE53C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CE53C.1	Choose the ideal alignment for highways after thorough understanding of planning and different surveys.
CE53C.2	Design various geometric elements of highway as per IRC standards
CE53C.3	Evaluate the pavement materials through various tests in the laboratory and design the crust thickness of flexible and rigid pavements as per IRC standards.
CE53C.4	Recognize different layers of pavement and illustrate the construction process and also suggest maintenance activities for flexible and rigid pavement.
CE53C.5	Select appropriate method of tunnel construction in different types of soils.

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NAME OF COURSE:		**HYDROLOGY AND WATER RESOURCE ENGINEERING**	
COURSE CODE:	**CE54C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKG**

Course Outcomes:

CE54C.1	Estimate runoff, based on rainfall data and watershed characteristics.
CE54C.2	Estimate design flood for a civil engineering project.
CE54C.3	Calculate yield of open well and tube well for various types of aquifers using knowledge of ground water hydrology.
CE54C.4	Elaborate National and State Water Policies
CE54C.5	Select appropriate water application technique of irrigation, depending upon type of crop, soil moisture and water availability.
CE54C.6	Select suitable soil & water conservation techniques for particular watershed.

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NAME OF COURSE:		**DESIGN OF CONCRETE STRUCTURES-I**	
COURSE CODE:	**CE55C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CE55C.1	Interpret the basic concept of limit state method.
CE55C.2	Design appropriate type of slab for a given condition.
CE55C.3	Analyze and Design suitable type of beam for a given condition
CE55C.4	Analyze and Design beam subjected to combined bending, shear and torsion.
CE55C.5	Analyze and Design axially as well as eccentrically loaded columns.

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NAME OF COURSE:		**ENVIRONMENTAL ENGINEERING-II**	
COURSE CODE:	**CE56C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. MDL**

Course Outcomes:

CE56C.1	Plan the layout of sewage collection system, matching with topography of the region and characterization of sewage
CE56C.2	Select aerobic or anaerobic wastewater treatment processes and decide their sequence.
CE56C.3	Design of aerobic and anaerobic wastewater treatment units and disposal of treated wastewater into the streams.
CE56C.4	Elaborate the novel decentralized wastewater treatment systems.
CE56C.5	Select appropriate methods of Solid waste Disposal and Management of hazardous waste based on their characteristics.
CE56C.6	Analyze air pollution and adopt various measures to control air pollution.

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NAME OF COURSE:		**PLANNING & DESIGN OF PUBLIC BUILDING**	
COURSE CODE:	**CE59L**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CE59L.1	Plan and design a "Public Building" according to requirements adhering to National Building Code norms and standards.
CE59L.2	Prepare "Permission Drawing" for public buildings for obtaining building permission from competent authority by using suitable 'Computer Aided Drawing and Design' application software.
CE59L.3	Plan and design appropriate building services layout for "Furniture requirement, Electrification points, Water supply and Drainage System" for a building as per standards norms by using suitable 'Computer Aided Drawing and Design' application software.
CE59L.4	Prepare "Perspective drawing of the Building" and "Line plan of any two Public Buildings" by using suitable 'Computer Aided Drawing and Design' application software.

CE59L.5	Prepare a report on selected Public Building.

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NAME OF COURSE:		**ELECTIVE (SELF LEARNING MODE) ECONOMICS**	
COURSE CODE:	**SL5**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

SL5.1	Identify the Basic Economic problems, Resource Constraints
SL5.2	Apply various theories of economics for economic growth
SL5.3	Identify causes of Inflation consequence and remedies
SL5.4	To assess the impact of International Trade, foreign exchange on Indian economy

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NAME OF COURSE:		**ELECTIVE (SELF LEARNING MODE) INTELLECTUAL PROPERTY RIGHTS FOR TECHNOLOGY DEVELOPMENT AND MANAGEMENT**	
COURSE CODE:	**SL5**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

SL5.1	Appreciate the intellectual property rights coming out of research and intellectual works
SL5.2	Demonstrate their knowledge about the process of acquiring the patents and copyrights for the innovative works.
SL5.3	Elaborate the role of Indian IPR system and role of WTO in protecting Intellectual Property Rights
SL5.4	Avoid the plagiarism in their thesis, research papers etc. which can be questioned legally

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Department of Civil Engineering

NAME OF COURSE:		**ELECTIVE (SELF LEARNING MODE) INTRODUCTION TO SOCIOLOGY**	
COURSE CODE:	**SL5**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

SL5.1	Interpret the effect of various social phenomena on sociology
SL5.2	Elaborate the role of urbanization on the society
SL5.3	Appreciate the need of social institutions for better society.
SL5.4	Assess the role of modernization, industrialization, environmental/ecological changes in the development of society.

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NAME OF COURSE:		**ELECTIVE (SELF LEARNING MODE) PROFESSIONAL ETHICS & HUMAN VALUE**	
COURSE CODE:	**SL5**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

SL5.1	Inculcate the human values in their behavior
SL5.2	Demonstrate the Engineering ethics in their professional practice.
SL5.3	Practice the safety and responsibility and professional rights in their professional practice.
SL5.4	Incorporate the code of ethics of Global organizations such as ASME

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NAME OF COURSE:		**ELECTIVE (SELF LEARNING MODE) PROFESSIONAL ETHICS & HUMAN VALUE**	
COURSE CODE:	**SL5**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

SL5.1	Inculcate the human values in their behavior
SL5.2	Demonstrate the Engineering ethics in their professional practice.
SL5.3	3Practice the safety and responsibility and professional rights in their professional practice.
SL5.4	Incorporate the code of ethics of Global organizations such as ASME

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SEMESTER - VI

NAME OF COURSE:		**FOUNDATION ENGINEERING**	
COURSE CODE:	**CE61C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. KCM**

Course Outcomes:

CE61C.1	Evaluate bearing capacity of soil by various analytical and experimental approaches by obtaining the data from soil exploration.
CE61C.2	Perform geotechnical design of shallow foundation such as isolated footing, combined footing, raft foundation.
CE61C.3	Apply suitable ground improvement techniques for construction of footing in difficult soil.
CE61C.4	Perform geotechnical design of deep foundation such as Pile foundation and Caisson foundation
CE61C.5	Investigate slope stability of embankments

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NAME OF COURSE:		**HYDRAULIC STRUCTURES AND WATER POWER ENGINEERING**	
COURSE CODE:	**CE63C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CE62C.1	Plan and design the reservoirs depending upon the water resources potential.
CE62C.2	Analyze and design Gravity dams and Earth dams (Simple Designs).
CE62C.3	Elaborate the design principles of Arch dams.
CE62C.4	Carry out Hydraulic Design of spillways
CE62C.5	Select appropriate method of river training depending upon river characteristics.
CE62C.6	Estimate water power potential at a site.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I STRUCTURAL ANALYSIS BY MATRIX METHODS**	
COURSE CODE:	**CE63C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CE63C.1	Describe the concepts of flexibility and stiffness method of analysis for simple problems.
CE63C.2	Analyze continuous beams, rigid frames and trusses by using element flexibility method.
CE63C.3	Analyze continuous beams, rigid frames and trusses by using element stiffness method
CE63C.4	Analyze continuous beams, trusses by direct stiffness method.
CE63C.5	Evaluate secondary stresses.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I STRUCTURAL DYNAMICS**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Dr. PPT**

Course Outcomes:

CE63E.1	Develop mathematical models for engineering structures using knowledge of structural Dynamics
CE63E.2	Apply different theories for vibration study of structures.
CE63E.3	Interpret dynamic analysis results for design, analysis and research purpose
CE63E.4	Apply structural dynamics theory to earthquake analysis and design of structures.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I DESIGN OF BRIDGES**	
COURSE CODE:	CE63E	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VMG**

Course Outcomes:

CE63E.1	Identify the various elements of bridges along with evaluation of various loads acting on the bridges as per the IRC bridge code
CE63E.2	Design the Solid Deck slab and T Beam Bridge superstructure for two lane and four lane bridges
CE63E.3	Design various components of substructure such as Pier, Abutments, foundations
CE63E.4	Design Bearing and expansion joint
CE63E.5	Carry out maintenance and repair of the bridge

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I DESIGN OF PRE STRESSED CONCRETE STRUCTURES**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CE63E.1	Study of different prestressing techniques
CE63E.2	Design of PSC beams for shear and torsion
CE63E.3	Design of Anchor block
CE63E.4	Analyse of complex structural systems (Indeterminate structures) and composite materials
CE63E.5	Analysis and design of prestressed concrete pipes

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I AIRPORT PLANNING AND DESIGN**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CE63E.1	Elaborate various components of an airport and aircraft characteristics affecting the design of airports.
CE63E.2	Design the runway and taxiway geometrics based on the likely aircrafts using the airport.
CE63E.3	Plan the requirements of terminal area and suggest an optimum layout for the terminal area based on passenger and baggage volume.
CE63E.4	Suggest a suitable method of grading and leveling work involved in the area along with drainage provisions for surface and subsurface water flows.
CE63E.5	Explain various air traffic control aids required for safe landing and take-off of aircrafts at the airport.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I PAVEMENT DESIGN**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. PPW**

Course Outcomes:

CE63E.1	List and explain the various factors affecting design and performance of pavements.
CE63E.2	Calculate ESWL and analyze various traffic parameters
CE63E.3	Calculate the stresses and deflection in flexible and rigid pavements.
CE63E.4	Design flexible and rigid pavements
CE63E.5	Design the overlay thickness for existing pavement as per IRC standards

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I CONSTRUCTION ENGINEERING MATERIALS**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CE63E.1	Examine the properties of common construction materials along with their behaviors under different environments, short- or long-term.
CE63E.2	Assess material properties, mechanical tests and quality control tests for, concrete, masonry, glass, plastics, iron and steel, paints and protective coatings, bituminous products, gypsum products, resilient flooring, and carpeting.
CE63E.3	Appraise appropriateness and sustainability of materials for construction projects.
CE63E.4	Select the sustainable materials based on the international standard practices and certification.
CE63E.5	Explain about innovative sustainable construction materials and their uses in construction.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I SYSTEMS ENGINEERING & ECONOMICS**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CE63E.1	Analyze the Systems in Engineering planning
CE63E.2	Build the model of system in Planning and Engineering
CE63E.3	Carry out 'Economic Evaluation' of Engineering system
CE63E.4	Explain Microeconomics for Engineers and Planners

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I ADVANCED CONCRETE TECHNOLOGY**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Dr. PPT**

Course Outcomes:

CE63E.1	Select proper admixtures to obtain concrete of desired properties
CE63E.2	Use of additions in concrete to enhanced properties
CE63E.3	Adopt appropriate type of special concrete for desired results
CE63E.4	Design a concrete mix of required strength and workability properties
CE63E.5	Adopt appropriate method for repairs and rehabilitation of concrete structures

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I OPEN CHANNEL FLOW & RIVER HYDRAULICS**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CE63E.1	Demonstrate basic principles of the open channel flow.
CE63E.2	Analyze the various types of flows viz. uniform and non-uniform flow, gradually varied flow, rapidly varied flow etc.
CE63E.3	Explain the mechanics of sediment transport
CE63E.4	Apply the knowledge of open channel hydraulics to river engineering.
CE63E.5	Apply the knowledge of dimensional analysis to develop different hydraulic models

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I SOLID AND HAZARDOUS WASTE MANAGEMENT**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. MDL**

Course Outcomes:

CE63E.1	Develop solid waste management systems with respect to its physical properties
CE63E.2	Select and adopt the appropriate methods for solid waste collection, transportation, redistribution and disposa
CE63E.3	Identify the types of hazards and describe methods of disposal of hazardous solid waste
CE63E.4	Implement legal, political and administrative considerations in design and operation of solid and hazardous waste management.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-I URBAN HYDROLOGY AND HYDRAULICS**	
COURSE CODE:	**CE63E**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VMG**

Course Outcomes:

CE63E.1	Develop intensity duration frequency curves for urban drainage systems.
CE63E.2	Develop design storms to size the various components of drainage systems.
CE63E.3	Apply best management practices to manage urban flooding.
CE63E.4	Prepare master drainage plan for an urbanized area.

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Department of Civil Engineering

NAME OF COURSE:		**DESIGN OF CONCRETE STRUCTURES-II**	
COURSE CODE:	**CE64C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CE64C.1	Analyze and Design of RCC Stairs and Column Footings.
CE64C.2	Analyze and Design of RCC Retaining walls and Water tanks.
CE64C.3	Analyze Pre stress concrete sections.
CE64C.4	Determine Loss of Pre stress and Design of Pre stress Beams.
CE64C.5	Analyze and Design the End Block of post tensioned PSC girder.

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NAME OF COURSE:		**PRINCIPLES OF MANAGEMENT AND QUANTITATIVE TECHNIQUES**	
COURSE CODE:	**CE65C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CE65C.1	Demonstrate decision making and communication as a member of a team as well as Lead a team for effective management of construction projects.
CE65C.2	Apply the Optimization techniques for decision making in construction industry.
CE65C.3	Explain the lean construction technique and its use in construction industry
CE65C.4	Carry out ABC analysis, Break even analysis and calculate EOQ and Inventory costs for construction project.
CE65C.5	List the various types of master libraries in the ERP system.
CE65C.6	Use Statistical Methods and Control charts (X, R, p, c charts) for quality control of materials and workmanship in Civil Engineering projects

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NAME OF COURSE:		**RAILWAY, AIRPORT & HARBOUR ENGINEERING**	
COURSE CODE:	**CE66C**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CE66C.1	Identify various components of Permnentway and know the constructions process of railway track.
CE66C.2	Acquires capability of choosing alignment and also design geometric aspects of railway system.
CE66C.3	Illustrate different types of signals, explain the working principles of railway interlocking system.
CE66C.4	Analyze and design the elements for orientation of runways, taxiways and passenger facility systems.
CE66C.5	Understand the various features in Harbours and Ports, their construction and coastal protection works.

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NAME OF COURSE:		**PROJECT ON STEEL STRUCTURES**	
COURSE CODE:	**CE67L**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. KCM**

Course Outcomes:

CE67L.1	Selection of roof truss / Portal frame. Decide various parameters to complete Geometry of truss / Portal frame
CE67L.2	Analyze the steel structure using standard structural engineering application software
CE67L.3	Design of various components of Industrial shed with roof truss or portal frame or gable Frame using relevant software and prepare their detailed computer aided drawing
CE67L.4	Design the various components of Building frame/Foot bridge/Welded plate girder and prepare their detailed computer aided drawing
CE67L.5	Create report for the structure as per Analysis and Design.

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NAME OF COURSE:		**MINI PROJECT USING APPLICATION SOFTWARE**	
COURSE CODE:	**CE69L**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**T.Y. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

CE69L.1	Identification and Selection of problems.
CE69L.2	Define aims and objectives of selected problem
CE69L.3	Decide various relevant parameters
CE69L.4	Find appropriate solution
CE69L.5	Generate technical report

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NAME OF COURSE:		**ENGINEERING ECONOMICS, ESTIMATION & COSTING**	
COURSE CODE:	**CV- 411**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VBG**

Course Outcomes:

CV-411.1	Analyze and evaluate economic alternatives for civil engineering projects.
CV-411.2	Write technical specifications for civil engineering works
CV-411.3	Carry out rate analysis based on market rates , schedule of rates and other relevant standard documents and codes.
CV-411.4	Take off quantities of items of construction for civil engineering works.
CV-411.5	Prepare tender documents and explain contract procedures.
CV-411.6	Prepare the valuation reports for land and buildings.

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NAME OF COURSE:		**CONSTRUCTION ENGINEERING, MANAGEMENT & CONSTRUCTION PRACTICES**	
COURSE CODE:	**CV- 412**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CV-412.1	Plan the project and prepare Bar chart and Network to optimize the project duration and cost
CV-412.2	Update the network and re evaluate the resources.
CV-412.3	Use appropriate project management application software for planning

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NAME OF COURSE:		**DESIGN OF CONCRETE STRUCTURES-II**	
COURSE CODE:	**CV- 413**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-413.1	Analyze and Design of RCC Stairs and Column Footings.
CV-413.2	Analyze and Design of RCC Retaining walls and Water tanks.
CV-413.3	Analyze Pre stress concrete sections
CV-413.4	Determine Loss of Pre stress and Design of Pre stress Beams.
CV-413.5	Analyze and Design the End Block of post tensioned PSC girder.

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NAME OF COURSE:		**EARTHQUAKE ENGINEERING**	
COURSE CODE:	**CV- 414**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Dr. PPT**

Course Outcomes:

CV-414.1	Apply the principles of Earthquake resistant philosophy in planning, design and construction of building.
CV-414.2	Perform the dynamic analysis of structures under earthquake load.
CV-414.3	Incorporate the Earthquake resistant features for various types of construction.
CV-414.4	Adopt the provisions of IS 1893
CV-414.5	.Incorporate the ductility features in the structures.

Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (A) METAL STRUCTURE BEHAVIOUR- I**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. PPW**

Course Outcomes:

CV-415.1	Able to design bolted and welded connections for tension and compression members and beams
CV-415.2	Able to analyze beam column behaviour
CV-415.3	Able to understand behaviour of Light gauge steel members
CV-415.4	Able to understand design concepts of cold formed/unrestrained beams
CV-415.5	Able to understand Fire resistance concept required for present days.

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (B) ADVANCED STRUCTURAL ANALYSIS**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CV-415.1	Draw ILD for indeterminate structures
CV-415.2	Analyze the beams curved in plan and beams resting on elastic foundation
CV-415.3	Analyze the Beam column
CV-415.4	Analyze the structures using structure oriented stiffness method.
CV-415.5	Analyze the structures using member oriented stiffness method

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (C) FINITE ELEMENT METHOD**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CV-415.1	Find solution to problems using direct approach methods like Rayleigh – Ritz or Galerkin‟s Method
CV-415.2	Analyze 1-D problems related to structural analysis like Bars, Trusses, Beams and Frames using finite element approach.
CV-415.3	Solve 2-D & 3D problems using knowledge of theory of elasticity.
CV-415.4	Apply Shape function, Natural Co-Ordinate systems, and classification of Isoparametric & Axisymmetric elements
CV-415.5	Analyze plate & shell elements
CV-415.6	Students will be able to implement the knowledge of numerical methods in FEM to find the solution to the various problems in statics and dynamics.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (D) TRAFFIC ENGINEERING AND MANAGEMENT**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CV-415.1	Undertake various traffic studies and analysis of traffic data including parking studies and calculation of parking demand.
CV-415.2	Explain relation between flow, density, speed, concept of level of service for urban and rural area.
CV-415.3	Explain the regulations on vehicle, driver and speed and Vehicle as per Motor Vehicle Rules.
CV-415.4	Design intersections and signals and propose various traffic signs, road marking and lighting at various locations.
CV-415.5	Explain applications and principles of various modern instruments used in traffic studies.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (E) GEOSYNTHETICS AND SOIL STRUCTURES**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CV-415.1	Identify the different types of geo textile and their suitability for the soil reinforcement structures;
CV-415.2	Perform the laboratory testing of Geo synthetics
CV-415.3	Design RE retaining structures
CV-415.4	Design the soil reinforcement for erosion control, Drainage and filtration
CV-415.5	Design soil reinforcement using Geo synthetic for pavement application and landfills

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (F) ADVANCED RAILWAY TRACK**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-415.1	Supervise a set of workers in the rectification of track defects including use of track machines
CV-415.2	Carry out special repairs to formation, track or bridges.
CV-415.3	Identify and quantify track defects
CV-415.4	Analyse slewing of curves.
CV-415.5	Inspect various track sites like Points and Crossings, curves level crossings and be able to fill the proforma in the inspection registers.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (G) CONSTRUCTION PRODUCTIVITY**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CV-415.1	Assess productivity effects & reasons of low productivity in construction industry.
CV-415.2	Differentiate responsibilities & roles of project participants to improve productivity.
CV-415.3	Measure and analyze productivity using classical methods of data gathering.
CV-415.4	Apply advance construction management approaches to improve productivity.
CV-415.5	Present and implement productivity improvement findings.
CV-415.6	Explore impact factors affecting productivity and quantity lost productivity.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (H) ENVIRONMENTAL SYSTEMS**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Dr. PPT**

Course Outcomes:

CV-415.1	To understand the concept of modeling & its classification
CV-415.2	To introduce about ecological modeling, single and multi-species modeling in brief.
CV-415.3	To study modeling waste water management system
CV-415.4	To study equations of continuity

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-II 415 (I) WATER POWER ENGINEERING**	
COURSE CODE:	**CV- 415**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CV-415.1	Estimate the available hydropower in a project
CV-415.2	Select suitable types of hydro-power system for particular site conditions
CV-415.3	Design penstock and anchor blocks
CV-415.4	Analyze the different types of loads on power plants
CV-415.5	Design the components of Tidal power plant

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NAME OF COURSE:		**PROJECT ON R. C. C. STRUCTURES**	
COURSE CODE:	**CV- 416**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CV-416.1	Apply codal provisions in the analysis and design of structures in accordance with relevant IS codes.
CV-416.2	Prepare detailed drawing of R.C.C section of designed building.
CV-416.3	Perform the analysis using relevant application software.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (A) INDUSTRIAL STRUCTURES**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-421.1	Plan different types of industrial structures.
CV-421.2	Analyze shed using single storey portal frame with and without gantry
CV-421.3	Analyze and design pressed circular steel tanks.
CV-421.4	Analyze steel chimney.
CV-421.5	Analyze and design steel towers.
CV-421.6	Analyze and design foundation for rotary machine and impact machine.

Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 415 (B) REPAIRS & REHABILITATION OF STRUCTURES**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CV-421.1	Understand the fundamentals of maintenance and repair strategies.
CV-421.2	Identify for serviceability and durability aspects of concrete.
CV-421.3	Know the materials and techniques used for repair of structures.
CV-421.4	Decide the appropriate repair and retrofitting techniques.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (C) PUBLIC TRANSPORTATION SYSTEMS**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. PPW**

Course Outcomes:

CV-421.1	Understand fundamentals of Public Transportation Systems.
CV-421.2	Differentiate different PTS user services
CV-421.3	Select appropriate technology depending upon site specific conditions.
CV-421.4	Design and implementation of Public Transportation Systems.
CV-421.5	Apply the various methodologies for Public Transportation Systems.
CV-421.6	Define the significance of Public Transportation Systems under Indian conditions

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (D) AIRPORT PLANNING AND DESIGN**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CV-421.1	Elaborate various components of an airport and aircraft characteristics affecting the design of airports.
CV-421.2	Design the runway and taxiway geometrics based on the likely aircrafts using the airport.
CV-421.3	Plan the requirements of terminal area and suggest an optimum layout for the terminal area based on passenger and baggage volume.
CV-421.4	Suggest a suitable method of grading and leveling work involved in the area along with drainage provisions for surface and subsurface water flows.
CV-421.5	Understand the various air traffic control aids required for safe landing and take-off of aircrafts at the airport.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (E) HIGH SPEED RAIL ENGINEERING**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-421.1	Introduced the regional planning for an HSR
CV-421.2	Explain the significance of HSR as a mode of transport.
CV-421.3	Demonstrate the basic design of HSR
CV-421.4	Carry out Structural Design of HRS system

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (F) CONSTRUCTION COST ANALYSIS**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. KCM**

Course Outcomes:

CV-421.1	Analyze various elements of the cost associated with the engineering project
CV-421.2	Estimate cost using estimating models
CV-421.3	Measure progress and track the cost of engineering projects
CV-421.4	Execute the cost management of project
CV-421.5	Explain value management process and relate Project Value and Risk
CV-421.6	carry out earned value analysis in an engineering project

Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (G) CONSTRUCTION EQUIPMENT & AUTOMATION**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CV-421.1	Compare the Construction equipments in terms of its suitability, efficiency and economy.
CV-421.2	Explain the 3D printing construction process and components.
CV-421.3	Explain the application of building management system and automation in on and offsite projects.
CV-421.4	Solve the construction issues through robotic techniques and Apply Robotics in Construction
CV-421.5	Apply computer in construction Information processing and explain the concepts of Communication and office automation system

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (H) RURAL WATER SUPPLY & ONSITE SANITATION SYSTEMS**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. LKJ**

Course Outcomes:

CV-421.1	Identify the problems pertaining to rural water supply and sanitation.
CV-421.2	Design water supply and sanitation system for rural community.
CV-421.3	Design low cost waste management systems for rural areas.
CV-421.4	Plan and design an effluent disposal mechanism.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (I) AIR AND NOISE POLLUTION AND CONTROL**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. PPW**

Course Outcomes:

CV-421.1	Proper understanding about the various air pollutants, their source of generation, their impacts, their effect on human, plants, environment and materials.
CV-421.2	Apply knowledge of meteorology for controlling air pollution and Design air pollution controlling equipments.
CV-421.3	Apply knowledge of legislation for prevention and control of air pollution.
CV-421.4	Knowledge to analyze quality of air in the form of air quality index and dispersion modeling.
CV-421.5	Basic information about Noise and its control.
CV-421.6	Hands on experience on sampling and measurements of air Pollutants

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-III 421 (J) SURFACE HYDROLOGY**	
COURSE CODE:	**CV- 421**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CV-421.1	Conduct Rainfall-Runoff Analysis, Solve Problems.
CV-421.2	Analyze hydrological and probabilistic data.
CV-421.3	Conduct frequency analysis, Learn Unit Hydrograph Theory.
CV-421.4	Determine catchment yield
CV-421.5	Learn the use of hydrological models and carry out flood routing. learn the use of instruments for the collection of Hydrological Field Data

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (A) METAL STRUCTURE BEHAVIOUR- II**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. SBA**

Course Outcomes:

CV-422.1	To understand the design of connections
CV-422.2	Analyze and design a Roof truss for given loading conditions
CV-422.3	To understand the analysis and design concept of round tubular structures
CV-422.4	To understand the design concept of different type of steel water tank
CV-422.5	To understand the design concept of lattice tower and steel chimney.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (B) DESIGN OF BRIDGES**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-422.1	Identify the various elements of bridges along with evaluation of various loads acting on the bridges as per the IRC bridge code
CV-422.2	Design the Solid Deck slab and T Beam Bridge superstructure for two lane and four lane bridges.
CV-422.3	Design various components of substructure such as Pier, Abutments, foundations
CV-422.4	Design Bearing and expansion joint
CV-422.5	Carry out maintenance and repair of the bridge.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (C) INFRASTRUCTURE PLANNING AND DESIGN**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof.PPW**

Course Outcomes:

CV-422.1	Apply Infrastructure Engineering concepts and a understand Project life cycle.
CV-422.2	Apply the principles of Public private partnership in Infrastructure
CV-422.3	Explain different risks involved in infrastructure projects and apply risk mitigation techniques.
CV-422.4	Explain policies and technologies prevailing in infrastructural engineering and the social aspects of infrastructure development.
CV-422.5	Apply the Information Technology and Systems tools for successful infrastructure Management.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (D) TRANSPORTATION ECONOMICS**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CV-422.1	Understand fundamentals of transportation economics
CV-422.2	Select appropriate technology for economic evaluation of transportation systems depending upon site specific conditions.
CV-422.3	Apply the various methodologies for Public Transportation Systems.
CV-422.4	Define the significance of transportation economics under Indian conditions.

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Department of Civil Engineering

NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (E) RAILWAY PROJECT DESIGN & PLANNING FOR CIVIL ENGINEERING**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. AGC**

Course Outcomes:

CV-422.1	Analyse the aspects which have to be considered for planning a railway project.
CV-422.2	Identify the technical parameters which have to go into a project.
CV-422.3	Estimate the very broad cost of the project.
CV-422.4	Assess the financial viability of the project based on inputs of revenue.
CV-422.5	Analyse and make an intelligent choice between various options for type spans for bridges, be able to plan a rough alignment on a topo sheet.
CV-422.6	Plan a rough alignment on a topo sheet.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (F) GROUND IMPROVEMENT TECHNIQUES**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. PPW**

Course Outcomes:

CV-422.1	1. Classify ground modification techniques for various type of soil
CV-422.2	2. Design shallow compaction system as well as deep dynamic compaction system
CV-422.3	3. Design hydraulic modification system such as PVD system, sand drains, stone columns, dewatering systems
CV-422.4	4. Apply various techniques of Physico-Chemical modification which suits the soil at the site
CV-422.5	5. Apply various techniques of soil Modification by inclusions and confinement.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (G) ADVANCED CONCRETE TECHNOLOGY**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-422.1	1. Select proper admixtures to obtain concrete of desired properties
CV-422.2	2. Adopt appropriate type of special concrete for desired results
CV-422.3	3. Design a concrete mix of required strength and workability properties
CV-422.4	4. Adopt appropriate method for repairs and rehabilitation of concrete structures

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (H) ENTREPRENEURSHIP**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. KCT**

Course Outcomes:

CV-422.1	1) Exhibit skills necessary to craft strategies and initiatives which can enable growth and sustainability in an entrepreneurial venture.
CV-422.2	2) Prepare preliminary and final project report
CV-422.3	3) Exhibit higher-level critical thinking skills, evidenced by analysis, evaluation, and synthesis.
CV-422.4	4) Demonstrate skills to establish and manage the accounting process, to employ break even and cost-volume-profit tools.

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (I) WATER & AIR QUALITY MODELLING**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. VMG**

Course Outcomes:

CV-422.1	1. To be able to understand the water quality programs and their implementation including the water sampling and analysis
CV-422.2	2. To be able to use water sampling and analysis techniques, water quality data analysis and WQI calculations. Students are also be able to understand of water quality modelling and exposure to some of the conventionally used water quality models.
CV-422.3	3. Learning of the techniques employed in the monitoring of particulates and gaseous pollutants in ambient air and stack gas
CV-422.4	4. Gaining knowledge about modelling of air quality through the use of different software

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NAME OF COURSE:		**PROFESSIONAL ELECTIVE COURSE-IV 422 (J) WATER RESOURCES FIELD METHODS**	
COURSE CODE:	**CV- 422**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof.LKJ**

Course Outcomes:

CV-422.1	1. Apply the knowledge of different aspects related to irrigation for better irrigation
CV-422.2	2. Decide irrigation charges
CV-422.3	3. Utilise proper technique of flow measurement through streams and canals.
CV-422.4	4. Apply the appropriate method of water distribution
CV-422.5	5. Use appropriate techniques of watershed management

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NAME OF COURSE:		**RAILWAY, AIRPORT & HARBOUR ENGINEERING**	
COURSE CODE:	**CV- 423**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof. YNB**

Course Outcomes:

CV-423.1	1. Acquires capability of choosing alignment and also design geometric aspects of railway system, runway and taxiway
CV-423.2	2. Understand the Construction techniques and Maintenance of Track laying and Railway stations and calculate the material quantities required for construction.
CV-423.3	3. Illustrate different types of signals explain the working principles of railway interlocking system.
CV-423.4	4. Gain an insight on the planning and site selection of Airport Planning and design.
CV-423.5	5. Analyze and design the elements for orientation of runways and passenger facility systems.
CV-423.6	6. Understand the various features in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted.

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NAME OF COURSE:		**OPEN ELECTIVE-III: ECONOMIC POLICIES IN INDIA**	
COURSE CODE:	**CV- 424**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	**Prof.AGC**

Course Outcomes:

CV-424.1	1. Analyze India's economic growth and development
CV-424.2	2. Assess industrial reforms in a mixed economic set-up
CV-424.3	3. Suggest tax reforms and financial sector reforms
CV-424.4	4. Explain Indian banking sector developments
CV-424.5	5. Analyze India and WTO regulations
CV-424.6	6. Analyze recent policy initiatives

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NAME OF COURSE:		**PROFESSIONAL PRACTICE, LAW & ETHICS**	
COURSE CODE:	**CV- 425**	**ACADEMIC YEAR :**	**2023-24**
CLASS :	**B.E. B.Tech**	**NAME OF SUBJECT TEACHER:**	

Course Outcomes:

CV-425.1	1. Explain role of various stakeholders in the Civil Engineering profession and
CV-425.2	2. Draft and interpret contracts and contracts management in civil engineering, dispute resolution mechanisms and laws governing engagement of labour
CV-425.3	3. Explain process of filing Intellectual Property Rights and Patents.
CV-425.4	4. Interpret and explain fundamental ethics governing the profession society as practitioners of the civil engineering profession.
CV-425.5	5. Explain legal and practical aspects of Civil Engineering profession