COs of All Programs

CIVIL ENGINEERING	
Course Code	**TRANSFORM CALCULUS, FOURIER SERIES AND NUMERICAL TECHNIQUES - 18MAT31**
C01	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
CO2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and field theory.
CO3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
CO4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
CO5	Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
Course Code	**STRENGTH OF MATERIALS - 18CV32**
C01	To evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements.
CO2	To evaluate the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements.
CO3	To analyse different internal forces and stresses induced due to representative loads on structural elements.
CO4	To evaluate slope and deflections of beams.
CO5	To evaluate the behaviour of torsion members, columns and struts.
Course Code	**FLUIDS MECHANICS - 18CV33**
C01	Possess a sound knowledge of fundamental properties of fluids and fluid continuum
CO2	Compute and solve problems on hydrostatics, including practical applications
CO3	Apply principles of mathematics to represent kinematic concepts related to fluid flow
CO4	Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
CO5	Compute the discharge through pipes and over notches and weirs
Course Code	**SBUILDING MATERIALS AND CONSTRUCTION - 18CV34**
C01	Select suitable materials for buildings and adopt suitable construction techniques.
CO2	Decide suitable type of foundation based on soil parameters
CO3	Supervise the construction of different building elements based on suitability
CO4	Exhibit the knowledge of building finishes and form work requirements
Course Code	**BUILDING MATERIALS AND CONSTRUCTION - 18CV34**

C01	Select suitable materials for buildings and adopt suitable construction techniques.
CO2	Decide suitable type of foundation based on soil parameters
CO3	Supervise the construction of different building elements based on suitability
CO4	Exhibit the knowledge of building finishes and form work requirements
Course Code	**BASIC SURVEYING - 18CV35**
C01	Posses a sound knowledge of fundamental principles Geodetics
CO2	Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
CO3	Capture geodetic data to process and perform analysis for survey problems
CO4	Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours
Course Code	**ENGINEERING GEOLOGY - 18CV36**
C01	Apply geological knowledge in different civil engineering practice.
CO2	Students will acquire knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials.
CO3	Civil Engineers are competent enough for the safety, stability, economy and life of the structures that they construct.
CO4	Able to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems.
CO5	Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering construction.
Course Code	**COMPUTER AIDED BUILDING PLANNING AND DRAWING - 18CVL37**
C01	Prepare, read and interpret the drawings in a professional set up.
CO2	Know the procedures of submission of drawings and Develop working and submission drawings for building.
CO3	Plan and design aresidential or public building as per the given requirements.
Course Code	**BUILDING MATERIALS TESTING LABORATORY - 18CVL38**
C01	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.
CO2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
CO3	Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.
Course Code	**ADDITIONAL MATHEMATICS – I 18MATDIP31**
C01	Apply concepts of complex numbers and vector algebra to analyze the problems arising in related area.
CO2	Use derivatives and partial derivatives to calculate rate of change of multivariate functions.
CO3	Analyze position, velocity and acceleration in two and three dimensions of vector valued functions.
CO4	Learn techniques of integration including the evaluation of double and triple integrals.
CO5	Identify and solve first order ordinary differential equations.
Course Code	**COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHOD 18CV41**
C01	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.

CO2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
Course Code	**ANALYSIS OF DETERMINATE STRUCTURES - 18CV42**
C01	Identify different forms of structural systems.
CO2	Construct ILD and analyse the beams and trusses subjected to moving loads
CO3	Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and beams.
CO4	Determine the stress resultants in arches and cables.
Course Code	**APPLIED HYDRAULICS - 18CV43**
C01	Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters
CO2	Design the open channels of various cross sections including economical channel sections
CO3	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation,
CO4	Compute water surface profiles at different conditions
CO5	Design turbines for the given data, and to know their operation characteristics under different operating conditions
Course Code	**CONCRETE TECHNOLOGY - 18CV44**
C01	Relate material characteristics and their influence on microstructure of concrete.
C02	Distinguish concrete behavior based on its fresh and hardened properties.
C03	Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.
C04	Adopt suitable concreting methods to place the concrete based on requirement.
C05	Select a suitable type of concrete based on specific application.
Course Code	**ADVANCED SURVEYING - 18CV45**
C01	Apply the knowledge of geometric principles to arrive at surveying problems
CO2	Use modern instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems.
CO3	Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments
CO4	Design and implement the different types of curves for deviating type of alignments.
Course Code	**WATER SUPPLY AND TREATMENT ENGINEERING - 18CV46**
C01	Estimate average and peak water demand for a community.
C02	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
C03	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
C04	Design a comprehensive water treatment and distribution system to purify and distribute water The required quality standards.

Course Code	ENGINEERING GEOLOGY LABORATORY - 18CVL47
C01	The students able to identify the minerals, rocks and utilize them effectively in civil engineering practices.
C02	The students will interpret and understand the geological conditions of the area for implementation of civil engineering projects.
C03	The students will interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
C04	The students will learn the techniques in the interpretation of LANDSAT Imageries to find out the lineaments and other structural features for the given area.
C05	The students will be able to identify the different structures in the field.
Course Code	**FLUID MECHANICS AND HYDRAULIC MACHINES LABORATORY - 18CVL48**
C01	Properties of fluids and the use of various instruments for fluid flow measurement.
CO2	Working of hydraulic machines under various conditions of working and their characteristics.
Course Code	**ADDITIONAL MATHEMATICS – II 18MATDIP41**
C01	Solve systems of linear equations using matrix algebra.
C02	Apply the knowledge of numerical methods in modelling and solving of engineering problems.
C03	Apply the knowledge of numerical methods in modelling and solving of engineering problems.
C04	Classify partial differential equations and solve them by exact methods.
C05	Apply elementary probability theory and solve related problems.
Course Code	**CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP - 18CV51**
C01	Prepare a project plan based on requirements and prepare schedule of a project by understanding the activities and their sequence.
CO2	Understand labour output, equipment efficiency to allocate resources required for an activity / project to achieve desired quality and safety.
CO3	Analyze the economics of alternatives and evaluate benefits and profits of a construction activity based on monetary value and time value.
CO4	Establish as an ethical entrepreneur and establish an enterprise utilizing the provisions offered by the federal agencies.
Course Code	**ANALYSIS OF INDETERMINATE STRUCTURES - 18CV52**
C01	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope defection method
CO2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
CO3	Construct the bending moment diagram for beams and frames by Kani's method.
	Construct the bending moment diagram for beams and frames using flexibility method
CO4	Analyze the beams and indeterminate frames by system stiffness method.
Course Code	**DESIGN OF RC STRUCTURAL ELEMENTS - 18CV53**
C01	Understand the design philosophy and principles.
CO2	Solve engineering problems of RC elements subjected to flexure, shear and torsion.
CO3	Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings.
CO4	Owns professional and ethical responsibility.

Course Code	BASIC GEOTECHNICAL ENGINEERING - 18CV54
C01	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
CO5	Capable of estimating load carrying capacity of single and group of piles
Course Code	**MUNICIPAL WASTEWATER ENGINEERING - 18CV55**
C01	Select the appropriate sewer appurtenances and materials in sewer network.
CO2	Design the sewers network and understand the self purification process in flowing water.
CO3	Deisgn the varies physic- chemical treatment units
CO4	Design the various biological treatment units
CO5	Design various AOPs and low cost treatment units.
Course Code	**HIGHWAY ENGINEERING - 18CV56**
C01	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
CO2	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
CO3	Design road geometrics, structural components of pavement and drainage.
CO4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.
Course Code	**SURVEYING PRACTICE - 18CVL57**
C01	Apply the basic principles of engineering surveying and for linear and angular measurements.
CO2	Comprehend effectively field procedures required for a professional surveyor.
CO3	Use techniques, skills and conventional surveying instruments necessary f o r engineering practice.
Course Code	**CONCRETE AND HIGHWAY MATERIALS LABORATORY - 18CVL58**
C01	Able to interpret the experimental results of concrete and highway materials based on laboratory tests.
C02	Determine the quality and suitability of cement.
C03	Design appropriate concrete mix Using Professional codes.
C04	Determine strength and quality of concrete.
C05	Evaluate the strength of structural elements using NDT techniques.
C06	Test the soil for its suitability as sub grade soil for pavements.
Course Code	**DESIGN OF STEEL STRUCTURAL ELEMENTS - 18CV61**
C01	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel.
C02	Understand the Concept of Bolted and Welded connections.
C03	Understand the Concept of Design of compression members, built-up columns and columns splices.

C04	Understand the Concept of Design of tension members, simple slab base and gusseted base.
C05	Understand the Concept of Design of laterally supported and un-supported steel beams.
Course Code	**APPLIED GEOTECHNICAL ENGINEERING - 18CV62**
C01	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C02	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C03	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C04	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C05	Capable of estimating load carrying capacity of single and group of piles
Course Code	**HYDROLOGY AND IRRIGATION ENGINEERING - 18CV63**
C01	Understand the importance of hydrology and its components.
C02	Measure precipitation and analyze the data and analyze the losses in precipitation.
C03	Estimate runoff and develop unit hydrographs.
C04	Find the benefits and ill-effects of irrigation.
C05	Find the quantity of irrigation water and frequency of irrigation for various crops.
C06	Find the canal capacity, design the canal and compute the reservoir capacity.
Course Code	**MATRIX METHOD OF STRUCTURAL ANALYSIS (Elective) - 18CV641**
C01	Evaluate the structural systems to application of concepts of flexibility and stiffness matrices for simple problems.
C02	Identify, formulate and solve engineering problems with respect to flexibility and stiffness matrices as applied to continuous beams, rigid frames and trusses.
C03	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
C04	Evaluate secondary stresses.
Course Code	**SOLID WASTE MANAGEMENT (Elective) - 18CV642**
C01	Analyse existing solid waste management system and to identify their drawbacks.
CO2	Evaluate different elements of solid waste management system.
CO3	Suggest suitable scientific methods for solid waste management elements.
CO4	Design suitable processing system and evaluate disposal sites.
Course Code	**ALTERNATE BUILDING MATERIALS (Elective) - 18CV643**
C01	Solve the problems of Environmental issues concerned to building materials and cost effective building technologies;
C02	Select appropriate type of masonry unit and mortar for civil engineering constructions; also they are able to Design Structural Masonry Elements under Axial Compression.
C03	Analyse different alternative building materials which will be suitable for specific climate and in an environmentally sustainable manner. Also capable of suggesting suitable agro and industrial wastes as a building material.
C04	Recommend various types of alternative building materials and technologies and design a energy efficient building by considering local climatic condition and building material.
Course Code	**GROUND IMPROVEMENT TECHNIQUES (Elective) - 18CV644**
CO1	Give solutions to solve various problems associated with soil formations having less strength.

CO2	Use effectively the various methods of ground improvement techniques depending upon the requirements.
CO3	utilize properly the locally available materials and techniques for ground improvement so that economy in the design of foundations of various civil engineering structures
Course Code	**RAILWAYS, HARBOUR, TUNNELING AND AIRPORTS (Elective) - 18CV645**
C01	Acquires capability of choosing alignment and also design geometric aspects of railway system, runway and taxiway.
CO2	Suggest and estimate the material quantity required for laying a railway track and also will be able to determine the hauling capacity of a locomotive.
CO3	Develop layout plan of airport, harbor, dock and will be able relate the gained knowledge to identify required type of visual and/or navigational aids for the same.
CO4	Apply the knowledge gained to conduct surveying, understand the tunneling activities.
Course Code	**REMOTE SENSING AND GIS (Elective) -18CV651**
C01	Collect data and delineate various elements from the satellite imagery using their spectral signature.
CO2	Analyze different features of ground information to create raster or vector data.
CO3	Perform digital classification and create different the maticmaps for solving specific problems
CO4	Make decision based on the GIS analysis on thematic maps.
Course Code	**TRAFFIC ENGINEERING(Elective) - 18CV652**
C01	Understand the human factors and vehicular factors in traffic engineering design.
CO2	Conduct different types of traffic surveys and analysis of collected data using statistical concepts.
CO3	Use anappropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
CO4	Understand the basic knowledge of Intelligent Transportation System.
Course Code	**OCCUPATIONAL HEALTH AND SAFETY (Elective) - 18CV653**
C01	Identify hazards in the work place that poseadangeror threat to their safety or health, orthatofothers.
CO2	Control unsafe or unhealthy hazards and propose methods to eliminate the hazard.
CO3	Present a coherent analysis of a potential safety or health hazard both verbally and in writing, citing the occupational Health and Safety Regulations as well as supported legislation.
CO4	Discuss the role of health and safety in the workplace pertaining to the responsibilities of workers, managers, supervisors.
CO5	Identify the decisions required to maintain protection of the environment, workplace as well as personal
Course Code	**SUSTAINABILITY CONCEPTS IN CIVIL ENGINEERING (Elective) - 18CV654**
C01	Learn the sustainability concepts; understand the role and responsibility of engineers in Sustainable Development.
CO2	Quantify sustainability, and resource availability, Rationalize the sustainability based on scientific merits.
CO3	Understand and apply sustainability concepts in construction practices, designs, product developments and processes across various engineering disciplines.

CO4	Make a decision in applying green engineering concepts and become a lifelong advocate of sustainability in society.
Course Code	**SOFTWARE APPLICATION LABORATORY - 18CVL66**
C01	Use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work
Course Code	**ENVIRONMENTAL ENGINEERING LABORATORY - 18CVL67**
C01	Acquire capability to conduct experiments and estimate the concentration of different parameters.
CO2	Compare the result with standards and discuss based on the purpose of analysis.
CO3	Determine type of treatment, degree of treatment for water and waste water.
CO4	Identify the parameter to be analyzed for the student project work in environmental stream.
Course Code	**EXTENSIVE SURVEY PROJECT - 18CVP68**
C01	Apply Surveying knowledge and tools effectively for the projects
CO2	Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioral competencies.
CO3	Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills.
CO4	Professional etiquettes at workplace, meeting and general
CO5	Establishing trust based relationships in teams & organizational environment
CO6	Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques
Course Code	**QUANTITY SURVEYING AND CONTRACT MANAGEMENT - 18CV71**
C01	Taking out quantities and work out the cost and preparation of abstract for the estimated cost for various civil engineering works.
CO2	Prepare detailed and abstract estimates for various road works, structural works and water supply and sanitary works.
CO3	Prepare the specifications and analyze the rates for various items of work.
CO4	Assess contract and tender documents for various construction works.
CO5	Determine the externals of functional and solve the simple problem of the calculus of variations.
Course Code	**DESIGN OF RCC AND STEEL STRUCTURES - 18CV72**
C01	Students will acquire the basic knowledge in design of RCC and Steel Structures.
CO2	Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.
Course Code	**THEORY OF ELASTICITY (Elective-1) - 18CV731**
C01	Ability to apply knowledge of mechanics and mathematics to model elastic bodies as continuum.
CO2	Ability to formulate boundary value problems; and calculate stresses and strains.
CO3	Ability to comprehend constitutive relations for elastic solids and compatibility constraints.
CO4	Ability to solve two-dimensional problems (plane stress and plane strain) using the concept of stress function
Course Code	**AIR POLLUTION AND CONTROL (Elective-1) - 18CV732**
C01	Identify the major sources of air pollution and understand their effects on health and environment.

CO2	Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
CO3	Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
CO4	Choose and design control techniques for particulate and gaseous emissions.
Course Code	**PAVEMENT MATERIALS AND CONSTRUCTION (Elective-1) - 18CV733**
C01	Students will be able to evaluate and assess the suitability of any pavement material to be used in various components of pavement by conducting required tests as per IS,IRC specifications
CO2	Students will be able to formulate the proportions of different sizes of aggregates to suit gradation criteria for various mixes as per MORTH and also design bituminous mixes.
CO3	Students will be competent to adapt suitable modern technique and equipment for speedy and economic construction.
CO4	Student will be able to execute the construction of embankment, flexible, rigid pavement and perform required quality control tests at different stages of pavement construction.
Course Code	**GROUND WATER HYDRAULICS (Elective-1) - 18CV734**
C01	Find the characteristics of aquifers
CO2	Estimate the quantity of ground water by various methods.
CO3	Locate the zones of ground water resources.
CO4	Select particular type of well and augment the ground water storage.
Course Code	**MASONRY STRUCTURES (Elective-1) - 18CV735**
C01	Select suitable material for masonry construction by understanding engineering properties.
CO2	Compute loads, load combinations and analyze the stresses in masonry.
CO3	Design masonry under compression (Axial load) for various requirements and conditions.
CO4	Design masonry under bending (Eccentric, lateral, transverse load) for various requirements and conditions.
CO5	Assess the behavior of shear wall and reinforced masonry.
Course Code	**EARTHQUAKE ENGINEERING (Elective-2) -18CV741**
C01	Acquire basic knowledge of engineering seismology.
CO2	Develop response spectra for a given earthquake time history and its implementation to estimate response of a given structure.
CO3	Understanding of causes and types of damages to civil engineering structures during different earthquake scenarios.
CO4	Analyze multi-storied structures modeled as shear frames and determine lateral force distribution due to earthquake input motion using IS-1893 procedures.
CO5	Comprehend planning and design requirements of earthquake resistant features of RCC and Masonry structures thorough exposure to different IS-codes of practices.
Course Code	**DESIGN CONCEPT OF BUILDING SERVICES (Elective-2) - 18CV742**
C01	Describe the basics of house plumbing and waste water collection and disposal.
CO2	Discuss the safety and guidelines with respect to fire safety.
CO3	Describe the issues with respect to quantity of water, rain water harvesting and roof top harvesting.
CO4	Understand and implement the requirements of thermal comfort in buildings.
Course Code	**REINFORCED EARTH STRUCTURES (Elective-2) - 18CV743**
C01	Identify, formulate reinforced earth techniques that are suitable for different soils and in different structures;

CO2	Understand the laboratory testing concepts of Geo synthetics
CO3	Design RE retaining structures and Soil Nailing concepts
CO4	Determine the load carrying capacity of Foundations resting on RE soil bed.
Course Code	**DESIGN OF HYDRAULIC STRUCTURES (Elective-2) - 18CV744**
C01	Check the stability of gravity dams and design the dam.
CO2	Estimate the quantity of seepage through earth dams.
CO3	Design spillways and aprons for various diversion works.
CO4	Select particular type of canal regulation work for canal network.
Course Code	**URBAN TRANSPORT PLANNING (Elective-2) - 18CV745**
C01	Design, conduct and administer surveys to provide the data required for transportation planning.
CO2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
CO3	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
CO4	Adopt the steps that are necessary to complete a long-term transportation plan.
Course Code	**FINITE ELEMENT METHOD (Elective-3) -18CV751**
C01	The student will have the knowledge on advanced methods of analysis of structures.
Course Code	**NUMERICAL METHODS AND APPLICATIONS (Elective-3) - 18CV752**
C01	The students will have a clear perception of the power of numerical techniques, ideas and would be able to demonstrate the applications of these techniques to problems drawn from Industry, management and other engineering fields.
Course Code	**ENVIRONMENTAL PROTECTION AND MANAGEMENT - (Elective-3)**
C01	Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards.
CO2	Lead pollution prevention assessment team and implement waste minimization options.
CO3	Develop, Implement, maintain and Audit Environmental Management systems for Organizations.
Course Code	**COMPUTER AIDED DETAILING OF STRUCTURES - 18CVL76**
C01	Prepare detailed working drawings of Steel Structures
CO2	Prepare detailed working drawings of RCC Structures
Course Code	**GEOTECHNICAL ENGINEERING LABORATORY -18CVL77**
C01	Physical and index properties of the soil
CO2	Classify based on index properties and field identification
CO3	To determine OMC and MDD, plan and assess field compaction program
CO4	Shear strength and consolidation parameters to assess strength and deformation characteristics
Course Code	**DESIGN OF PRE- STRESSECONCRETE - 18CV81**
C01	Understand the requirement of PSC members for present scenario.
CO2	Analyse the stresses encountered in PSC element during transfer and at working.
CO3	Understand the effectiveness of the design of PSC after studying losses
CO4	Capable of analyzing the PSC element and finding its efficiency
CO5	Design PSC beam for different requirements.

Course Code	BRIDGE ENGINEERING (Elective-2) -18CV821
C01	Understand the load distribution and IRC standards.
CO2	Design the slab and T beam bridges.
CO3	Design Box culvert, pipe culvert
CO4	Use bearings, hinges and expansion joints
CO5	Design Piers and abutments.
Course Code	**PREFABRICATED STRUCTURES (Elective-2) -18CV822**
C01	Use modular construction, industrialized construction
CO2	Design prefabricated elements
CO3	Design some of the prefabricated elements
CO4	Use the knowledge of the construction methods and prefabricated elements in buildings
Course Code	**ADVANCED FOUNDATION ENGINEERING (Elective-2) - 18CV823**
C01	Estimate the size of isolated and combined foundations to satisfy bearing capacity and settlement criteria.
CO2	Estimate the load carrying capacity and settlement of single piles and pile groups including laterally loaded piles.
CO3	Understand the basics of analysis and design principles of well foundation, drilled piers and caissons.
CO4	Understand basics of analysis and design principles of machine foundations.
Course Code	**REHABILITATION AND RETROFITTING (Elective-2) - 18CV824**
C01	Identify the causes for structural (Concrete) deterioration.
CO2	Assess the type and extent of damage and carry out damage assessment of structures through various types of tests.
CO3	Recommend maintenance requirements of the buildings and preventive measures against influencing factors.
Course Code	**PAVEMENT DESIGN (Elective-2) - 18CV825**
C01	Systematically generate and compile required data's for design of pavement (Highway & Airfield).
CO2	Analyze stress, strain and deflection by boussinesq's, bur mister's and westergaard's theory.
CO3	Design rigid pavement and flexible pavement conforming to IRC58-2002 and IRC37-2001
CO4	Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements
Course Code	**PROJECT WORK PHASE-2 - 18CVP83**
C01	Describe the project and be able to defend it.
CO2	Develop critical thinking and problem solving skills.
CO3	Learn to use modern tools and techniques.
CO4	Communicate effectively and to present ideas clearly and coherently both in written and oral forms.
C05	Develop skills to work in a team to achieve common goal.
CO6	Develop skills of project management and finance.
CO7	Develop skills of self learning, evaluate their learning and take appropriate actions to improve it.
CO8	Prepare them for life-long learning to face the challenges and support the technological changes to meet the societal needs.

Course Code	TECHNICAL SEMINAR - 18CVS84
C01	Develop knowledge in the field of Civil Engineering and other disciplines through independent learning and collaborative study
CO2	Identify and discuss the current, real-time issues and challenges in engineering & technology.
CO3	Develop written and oral communication skills.
C04	Explore concepts in larger diverse social and academic contexts.
CO5	Apply principles of ethics and respect in interaction with others.
CO6	Develop the skills to enable life-long learning.
Course Code	**INTERNSHIP /PROFESSIONAL PRACTICE - 18CVI85**
CO1	Students will get the field exposure and experience