Course Outcomes of Department of Civil Engineering

Course Name	Strength of Materials
Course Code	17CV32
CO1	To evaluate the strength of various structural elements internal forces such as compression, tension, shear, bending and torsion.
CO2	To suggest suitable material from among the available in the field of construction and manufacturing.
CO3	To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts
CO4	To understand the basic concept of analysis and design of members subjected to torsion.
CO5	To understand the basic concept of analysis and design of structural elements such as columns and struts.
Course Name	Fluid Mechanics
Course Code	17CV33
CO1	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 Name	Basic Surveying
Course Code	17CV34
CO1	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
CO5	Apply various arithmetic and logical operations on integer and floating point numbers, hard wired control, microcontroller's instructions and embedded systems.
Course Name	Engineering Geology
Course Code	17CV35
CO1	Students will able to apply the knowledge of geology and its role in Civil Engineering
CO2	Students will effectively utilize earth's materials such as mineral, rocks and water in civil engineering practices.
CO3	Analyze the natural disasters and their mitigation.
CO4	Assess various structural features and geological tools in ground water exploration, Natural resource estimation and solving civil engineering problems.
CO5	Apply and asses use of building materials in construction and asses their properties
Course Name	Building Materials and Construction
Course Code	17CV36
CO1	Select suitable materials for buildings and adopt suitable construction techniques.
CO2	Adopt suitable repair and maintenance work to enhance durability of buildings.
Course Name	Building Materials Testing Laboratory
Course Code	17CVL37

CO1	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	17CVL38
CO1	Apply the basic principles of engineering surveying for linear and angular measurements.
CO2	Comprehend effectively field procedures required for a professional surveyor.
CO3	Use techniques, skills and conventional surveying instruments necessary for engineering practice.
Course Name	Analysis of Determinate Structures
Course Code	17CV42
CO1	Evaluate the forces i n determinate trusses by method of joints and sections.
CO2	Evaluate the deflection of cantilever, simply supported and overhanging beams by different methods
CO3	Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and bent frames.
CO4	Determine the stress resultants in arches and cables.
CO5	Understand the concept of influence lines and construct the ILD diagram for the moving loads.
Course Name	Applied Hydraulics
Course Code	17CV43
CO1	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 Name	Concrete Technology
Course Code	17CV44
CO1	Relate material characteristics and their influence on microstructure of concrete.
CO2	Distinguish concrete behaviour based on its fresh and hardened properties.
CO3	Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.
Course Name	Basic Geotechnical Engineering
Course Code	17CV45
CO1	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
CO2	Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
CO3	Will be able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure

CO4	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
CO5	Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same.
Course Name	Advanced Surveying
Course Code	17CV46
CO1	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 Name	Fluid Mechanics Laboratory
Course Code	17CVL47
CO1	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 Name	Engineering Geology Laboratory
Course Code	17CVL48
CO1	Identifying the minerals and rocks and utilize them effectively in civil engineering practices
CO2	Understanding and interpreting the geological conditions of the area for the implementation of civil engineering projects.
CO3	Interpreting subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geo physical methods.
CO4	Thetechniquesofdrawingthecurvesofelectricalresistivitydataanditsinterpretationforgeotechnicalandaquiferboundaries.
Course Name	Design of RC Structural Elements
Course Code	15CV51
CO1	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 Name	Analysis of Indeterminate Structures
Course Code	15CV52
CO1	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.
CO4	Construct the bending moment diagram for beams and frames using flexibility method
CO5	Analyze the beams and indeterminate frames by system stiffness method.
Course Name	Applied Geotechnical Engineering
Course Code	15CV53
CO1	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 Name	Computer Aided Building Planning and Drawing
Course Code	15CV54
CO1	Gain a broad understanding of planning and designing of buildings
CO2	Prepare, read and interpret the drawings in a professional set up.
CO3	Know the procedures of submission of drawings and Develop working and submission drawings for building
CO4	Plan and design a residential or public building as per the given requirements
Course Name	Air Pollution and Control
Course Code	15CV551
CO1	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 Name	Traffic Engineering
Course Code	15CV561
CO1	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 an appropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
CO4	Understand the basic knowledge of Intelligent Transportation System.
Course Name	Geotechnical Engineering Lab
Course Code	15CVL57
CO1	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
CO5	In-situ shear strength characteristics (SPT- Demonstration)
Course Name	Concrete a nd Highway Materials Laboratory
Course Code	15CVL58
CO1	Conduct appropriate laboratory experiments and interpret the results
CO2	Determine the quality and suitability of cement
CO3	Design appropriate concrete mix
CO4	Determine strength and quality of concrete
CO5	Test the road aggregates and bitumen for their suitability as road material.
CO6	Test the soil for its suitability as sub grade soil for pavements.
Course Name	Construction Management and Entrepreneurship

Course Code	15CV61
CO1	Understand the construction management process.
CO2	Understand and solve variety of issues that are encountered by every professional in discharging professional duties.
CO3	Fulfill the professional obligations effectively with global outlook
Course Name	Design of Steel Structural Elements
Course Code	15CV62
CO1	Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
CO2	Understand the Concept of Bolted and Welded connections.
CO3	Understand the Concept of Design of compression members, built-up columns and columns splices.
CO4	Understand the Concept of Design of tension members, simple slab base and gusseted base.
CO5	Understand the Concept of Design of laterally supported and un-supported steel beams.
Course Name	Highway Engineering
Course Code	15CV63
CO1	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 Name	Water Supply and Treatment Engineering
Course Code	15CV64
CO1	Estimate average and peak water demand for a community.
CO2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
CO3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
CO4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.
Course Name	Matrix Method of Structural Analysis
Course Code	15CV652
CO1	Evaluate the structural systems to application of concepts of flexibility and stiffness matrices for simple problems.
CO2	Identify, formulate and solve engineering problems with respect to flexibility and stiffness matrices as applied to continuous beams, rigid frames and trusses.
CO3	Identify, formulate and solve engineering problems by application of concepts of direct stiffness method as applied to continuous beams and trusses.
Course Name	Ground Improvement Techniques
Course Code	15CV654
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 d esign of foundations of various civil engineering structures
Course Name	Water Resources Management
Course Code	15CV661
CO1	Assess the potential of groundwater and surface water resources.
CO2	Address the issues related to planning and management of water resources.
CO3	Know how to implement IWRM in different regions.
CO4	Understand the legal issues of water policy.
CO5	Select the method for water harvesting based on the area.
Course Name	Software Application Lab
Course Code	15CVL67
CO1	use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work
Course Name	Extensive Survey Project /Camp
Course Code	15CVP68
CO1	Understand the practical applications of Surveying.
CO2	Use Total station and other Measurement Equipments.
CO3	Work in teams and learn time management, communication and presentation skills
Course Name	Municipal and Industrial Waste Water Engineering
Course Code	15CV71
CO1	Acquires capability to design sewer and Sewerage treatment plant.
CO2	Evaluate degree of treatment and type of treatment for disposal, reuse and recycle.
CO3	Identify waste streams and design the industrial waste water treatment plant.
CO4	Manage sewage and industrial effluent issues.
Course Name	Design of RCC and Steel Structures
Course Code	15CV72
CO1	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 Name	Hydrology and Irrigation Engineering
Course Code	15CV73
CO1	Understand the importance of hydrology and its components.
CO2	Measure precipitation and analyze the data and analyze the losses in precipitation.
CO3	Estimate runoff and develop unit hydrographs.
CO4	Find the benefits and ill-effects of irrigation.
CO5	Find the quantity of irrigation water and frequency of irrigation for various crops.
CO6	Find the canal capacity, design the canal and compute the reservoir capacity
Course Name	Design of Bridges
Course Code	15CV741
CO1	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 and
CO5	Design Piers and abutments.
Course Name	Ground Water & Hydraulics
Course Code	15CV742
CO1	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.
CO5	Design Piers and abutments.
Course Name	Urban Transportation and Planning
Course Code	15CV751
CO1	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 Name	Environmental Engineering Laboratory
Course Code	15CVL76
CO1	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 Name	Computer Aided Detailing of Structures
Course Code	15CVL78
Course Name	ENVIRONMENTAL ENGINEERING – II
Course Code	10CV71
CO1	Estimate average and peak water demand for a community.
CO2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
CO3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
CO4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.
Course Name	Design of Steel Structural Elements
Course Code	10CV72
CO1	Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
CO2	Understand the Concept of Bolted and Welded connections.
CO3	Understand the Concept of Design of compression members, built-up columns and columns splices.
CO4	Understand the Concept of Design of tension members, simple slab base and gusseted base.

CO5	Understand the Concept of Design of laterally supported and un-supported steel beams.
Course Name	ESTIMATION & VALUATION
Course Code	10CV73
CO1	Prepare detailed and abstract estimates for roads and building.
CO2	Prepare valuation reports of buildings.
CO3	Interpret Contract document's of domestic and international construction works
Course Name	DESIGN OF PRE-STRESSED CONCRETE STRUCTURES
Course Code	10CV74
CO1	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 Name	HIGHWAY GEOMETRIC DESIGN
Course Code	10CV75
CO1	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 Name	10CV763
Course Code	PAVEMENT MATERIALS AND CONSTRUCTION
CO1	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
CO2	Design road geometrics, structural components of pavement and drainage.
CO3	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.
Course Name	10CVL77
Course Code	ENVIRONMENTAL ENGINEERING LABORATORY
CO1	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 Name	Concrete & Highway Materials Laboratory
Course Code	10CVL78
CO1	Conduct appropriate laboratory experiments and interpret the results
CO2	Determine the quality and suitability of cement
CO3	Design appropriate concrete mix
CO4	Determine strength and quality of concrete

CO5	Test the road aggregates and bitumen for their suitability as road material.
CO6	Test the soil for its suitability as sub grade soil for pavements.
Course Name	Quantity Surveying and Contracts Management
Course Code	15CV81
CO1	Prepare detailed and abstract estimates for roads and building.
CO2	Prepare valuation reports of buildings.
CO3	Interpret Contract document's of domestic and international construction works
Course Name	Design of Pre Stressed Concrete Elements
Course Code	15CV82
CO1	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 Name	Advanced Foundation Design
Course Code	15CV834
CO1	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