

| Subject Name with Code | Course Outcomes |
|---|---|
| Engineering Mathematics-III 15CV31 | Know the use of periodic signals and Fourier series to analyze circuits and system communications. |
| | Explain the general linear system theory for continuous-time signals and digital signal processing using Fourier Transform and analyze discrete-time systems using convolution and the z-transform. |
| | Employ appropriate numerical methods to solve algebraic and transcendental equations and also to calculate a definite integral numerically. |
| | Apply Green's Theorem, Divergence Theorem and Stokes' theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems. |
| | Determine the externals of functional and solve the simple problem of the calculus of variations. |
| Strength of Materials 15CV32 | To evaluate the strength of various structural elements internal forces such as compression, tension, shear, bending and torsion. |
| | To suggest suitable material from among the available in the field of construction and manufacturing. |
| | To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts. |
| | To understand the basic concept of analysis and design of members subjected to torsion. |
| | To understand the basic concept of analysis and design of structural elements such as columns and struts. |
| Fluid Mechanics 15CV33 | Possess a sound knowledge of fundamental properties fluids and fluid continuum. |
| | Compute and solve problems on hydrostatics, including practical applications. |
| | Apply principles of mathematics to represent kinematic concepts related to fluid flow. |
| | Apply fundamental laws of fluid mechanics- conservation of mass, conservation of linear momentum, & the Bernoulli's principle for practical applications. |
| | Compute the flow through pipes inclusive of their head losses. |
| | Compute the discharge through the weirs, notches, orifices and mouthpieces. |
| Basic Surveying 15CV34 | Understand the basic principles of Geodetics. |
| | Vertical and horizontal, Linear and Angular measurements to arrive at solutions to basic surveying problems. |
| | Employ conventional surveying data capturing techniques and process the data for computations. |
| | Analyze the obtained spatial data to compute areas and volumes and draw contours to represent 3D data on plane figures. |
| Engineering Geology 15CV35 | Students will able to apply the knowledge of geology and its role in Civil Engineering |
| | Students will effectively utilize earth's materials such as mineral, rocks and water in civil engineering practices. |
| | Analyze the natural disasters and their mitigation. |
| | Assess various structural features and geological tools in ground water exploration, Natural resource estimation and solving civil engineering problems. |
| | Apply and asses use of building materials in construction and asses their properties |
| Building Materials and Construction 15CV36 | Students have an understanding of legal Principles relating to construction activities |
| | Identify type of brickwork, plastering and wood |
| | Understand the methodology of prefabrication |
| Building Materials Testing Laboratory 15CVL37 | Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion. |
| | Identify, formulate and solve engineering problems of structural elements Subjected to flexure. |
| | Evaluate the impact of engineering solutions on the society and also will be aware of Contemporary issues regarding failure of structures due to undesirable materials. |
| Basic Surveying Practice 15CVL38 | Apply the basic principles of engineering surveying and for linear and angular measurements. |
| | Comprehend effectively field procedures required for a professional surveyor. |
| | Use techniques, skills and conventional surveying instruments necessary for engineering practice |

| Subject Name with Code | Course Outcomes |
|---|--|
| Engineering Mathematics – IV 15CV41 | Use appropriate single step and multi-step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems. |
| | Explain the idea of analyticity, potential field's residues and poles of complex potentials in field theory and Electromagnetic theory. |
| | Employ Bessel's functions and Legendre's polynomials for tackling problems arising in continuum mechanics, hydrodynamics and heat conduction. |
| | Describe random variables and probability distributions using rigorous statistical methods to analyze problems associated with optimization of digital circuits, information, coding theory and stability analysis of systems. |
| | Apply the knowledge of joint probability distributions and Markov chains in attempting engineering problems for feasible random events. |
| Analysis of Determinate Structures 15CV42 | Evaluate the forces in determinate trusses by method of joints and sections. |
| | Evaluate the deflection of beams-cantilever, simply supported and overhanging beams |
| | by different methods and also evaluations using moment diagram by parts. |
| | Understand the energy principles and energy theorems and its applications to |
| | determine the deflections of trusses and bent frames. |
| | Determine the stress resultants in arches and cables. |
| | Understand the concept of influence lines and construct the ILD diagram for the moving loads. |
| Applied Hydraulics 15CV43 | Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters. |
| | Design the open channels of various cross sections including optimum design sections. |
| | Apply Energy concepts of fluid in open channel, calculate Energy dissipation, compute. Water profiles at different conditions. |
| | Analyze the performance of Turbines and Pumps for various design data and to know their corresponding operation characteristics, including designing the required hydraulic machines for the given data. |
| Concrete Technology 15CV44 | Relate material characteristics and their influence on microstructure of concrete. |
| | Distinguish concrete behaviour based on its fresh and hardened properties. |
| | Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes. |
| Basic Geotechnical Engineering 15CV45 | Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties |
| | Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures |
| | 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 |
| | 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. |
| | Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same. |
| Advanced Surveying 15CV46 | Apply the knowledge of geometric principles to arrive at surveying problems |
| | Use modern instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems. |
| | Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments; |
| | Design and implement the different types of curves for deviating type of alignments. |
| Fluid Mechanics and Hydraulic Machines Laboratory 15CVL47 | Properties of fluids and the use of various instruments for fluid flow measurement. |
| | Working of hydraulic machines under various conditions of working and their characteristics |
| Engineering Geology Laboratory 15CVI48 | Identifying the minerals and rocks and utilize them effectively in civil engineering practices. |
| | Understanding and interpreting the geological conditions of the area for the implementation of civil engineering projects. |
| | Interpreting subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods. |
| | The techniques of drawing the curves of electrical resistivity data and its interpretation for geotechnical and aquifer boundaries |
| Design Of RC Structural Elements 15CV51 | Solve engineering problems of RC elements subjected to flexure, shear and torsion. |
| | Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings. |
| | Owns professional and ethical responsibility. |

| Subject Name with Code | Course Outcomes |
|---|--|
| Analysis of Indeterminate Structures 15CV52 | <p>Develop Slope Deflection equations and analyse continuous beams and sway & non-sway frames by Slope Deflection Method.</p> <p>Define terms like distribution factor and carry over factor and analyse continuous beams and sway & non-sway frames by Moment Distribution Method.</p> <p>Analyse continuous beams and sway & non-sway frames by Kani's method.</p> <p>Develop flexibility and stiffness matrix for beam, plane truss element and axially rigid framed structural element and analyse continuous beam, plane truss and axially rigid plane frames by flexibility and stiffness method.</p> |
| Applied Geotechnical Engineering 15CV53 | <p>Ability to plan and execute geotechnical site investigation program for different civil engineering projects</p> <p>Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils</p> <p>Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures</p> <p>Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure</p> <p>Capable of estimating load carrying capacity of single and group of piles</p> |
| Computer Aided Building Planning & Drawing 15CV54 | <p>Gain a broad understanding of planning and designing of buildings</p> <p>Prepare, read and interpret the drawings in a professional set up.</p> <p>Know the procedures of submission of drawings and Develop working and submission Drawings for building</p> |
| Air Pollution & Control (Elective) 15CV551 | <p>Identify the major sources of air pollution and understand their effects on health and environment.</p> <p>Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.</p> <p>Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.</p> <p>Choose and design control techniques for particulate and gaseous emissions.</p> |
| Remote Sensing and Gis (Elective) 15CV563 | <p>Collect data and delineate various elements from the satellite imagery using their spectral signature.</p> <p>Analyze different features of ground information to create raster or vector data</p> <p>Perform digital classification and create different thematic maps for solving specific problems</p> <p>Make decision based on the GIS analysis on thematic maps.</p> |
| Geotechnical Engineering Laboratory 15CVL57 | <p>Physical and index properties of the soil</p> <p>Classify based on index properties and field identification</p> <p>To determine OMC and MDD, plan and assess field compaction program</p> <p>Shear strength and consolidation parameters to assess strength and deformation characteristics</p> <p>In-situ shear strength characteristics (SPT- Demonstration)</p> |
| Concrete & Highway Materials Laboratory 15CVL58 | <p>Draw the conclusions based on the analysis & interpretation of results through various tests on cement sample by investigation.</p> <p>Analyze and interpret the results obtained from the tests conducted on fresh concrete for its use in construction industry.</p> <p>Design the mix of concrete for the field and various applications from compressive and tensile strength of the hardened concrete.</p> <p>Investigate the properties of bituminous materials and mixes for the design of the pavement.</p> <p>Distinguishes different sizes and shapes of aggregate particles and their effect in construction with respect to the strength, Impact and Abrasion</p> <p>Decide the thickness of the pavement from the density of soil ,by the tests conducted on the given soil sample.</p> |
| Environmental Engineering - I 10CV61 | <p>Explain the need for protected water supply, population forecasting methods & quantity calculation for various use.</p> <p>Explain the Sources of water, Collection & Conveyance of water, & design water distribution mains.</p> <p>Evaluate the Physical, Chemical & Microbiological characteristics of water & the method of examination.</p> <p>Explain the process of sedimentation & coagulation treatment for the removal of settleable & suspended matter from water.</p> <p>Explain the process of Filtration treatment for the removal of suspended matter from water.</p> <p>Explain the process of disinfection & water softening for the removal of micro organisms & hardness from water respectively.</p> <p>Explain miscellaneous water treatment methods like Aeration, Adsorption, Fluoridation & Defluoridation.</p> |

| Subject Name with Code | Course Outcomes |
|---|---|
| Design & Drawing of RC structures 10CV62 | <p>Design of concrete structures like portal frames, retaining walls, water tanks.</p> <p>Prepare structural drawing as per standard publications.</p> <p>Produce design calculations and drawing in appropriate professional format.</p> <p>Prepare schedule of reinforcements and calculate quantity of steel.</p> |
| Transportation Engineering -II 10CV63 | <p>Distinguish various components of rails.</p> <p>Classify various types of sleepers and ballast.</p> <p>Design the geometrical elements of tracks.</p> <p>Explain various types of points and crossings.</p> <p>Discuss the various parts of airports and design the runway.</p> <p>Demonstrate the factors affecting taxiway and design its geometrical elements.</p> <p>Explain different tunneling methods.</p> <p>Classify the harbors and draw the layout with the components.</p> |
| Geotechnical Engineering – II 10CV64 | <p>Specify the essential features and requirements of a site investigation.</p> <p>Explain the drainage and dewatering techniques.</p> <p>Compute the stresses in the soil for various loading conditions.</p> <p>Explain and ability to solve the problems related to seepage through the concept of Flownets.</p> <p>Examine, appraise and calculate active and passive earth pressures.</p> <p>Ascertain the stability of a slope using different analysis methods</p> <p>Identify and calculate the parameters needed such as bearing capacity, effect of water table etc. for the design of foundations, including footing settlement.</p> <p>Identify the type of foundation required and to proportion the shallow and deep foundations.</p> |
| Hydraulic Structures &Irrigation Design Drawing 10CV65 | <p>Explain and discuss reservoir planning</p> <p>Enumerate the various forces acting on gravity dam and its importance.</p> <p>Understand earthen bund concepts</p> <p>Design &detailed drawing of Surplus weir, Tank sluice, Canal Drop, Canal Cross regulator &Aqueduct structure</p> |
| Alternative Building Materials and Technologies 10CV662 | <p>Express the environmental issues concerned to building materials.</p> <p>Implement the different building blocks to minimize the impact on environment and economize the structures.</p> <p>Demonstrate the importance of lime pozzolana cement and types of agro wastes.</p> <p>Implement alternative building technologies.</p> <p>Analyse and Design the masonry buildings using IS-code provisions.</p> <p>Incorporate cost saving techniques for buildings during planning, design and construction.</p> <p>Utilize different equipments for the production of alternative building materials.</p> |
| Rural Water Supply and Sanitation 10CV666 | <p>Explain the need for protected water supply and identify drinking water quality standards.</p> <p>Define water supply systems, ground water contamination and explain different water treatment methods, (Disinfection methods, Defluoridation process) their importance and requirement.</p> <p>Explain the need for rural sanitation and summaries the different methods of disposal such as trenching, composting, septic tank etc.</p> <p>Plan Rain water harvesting system.</p> <p>Describe different types of communicable diseases and state their control measures.</p> <p>Explain Refuse collection, transportation, separation, storage and disposal methods.</p> <p>Explain Milk sanitation, Milk ordinance and code.</p> <p>Describes life cycle of insects, their diseases transmit ion and state control measures.</p> |

| Subject Name with Code | Course Outcomes |
|---|--|
| Geotechnical Engineering Laboratory 10CVL67 | Identify the different types of soils. |
| | Determine water content, specific gravity, grain size analysis and consistency Limits for given soil sample. |
| | Determine the in-situ density of soil by various methods. |
| | Determine the optimum moisture content and maximum dry density by Standard Proctor Compaction Test and Modified Proctor Compaction Test. |
| | Determine coefficient of permeability by Constant head & Variable head methods. |
| | Determine cohesion and angle of internal friction by strength test like Unconfined Compression Test, Direct Shear Test, and Triaxial Compression Test. |
| | Determine the compression index and coefficient of consolidation by consolidation test. |
| | Determine the shear strength of soil by vane shear test. |
| | Demonstrate the miscellaneous equipment's such as Augers, Samplers etc. |
| | Demonstrate the Rapid moisture meter, Proctor's needle, Hydrometer test, free Swell Index, Swell Pressure test and relative density of sands. |
| | Prepare a consolidated report of index properties and strength properties of soil |
| | Communicate the concepts and results of their laboratory experiments through effective writing and oral communication skills. |
| Environmental Engg.-II 10CV71 | Explain the importance of Sanitation in the community& describe types of Waste water & quantity calculation. |
| | Explain waste water collection systems & design sewers. |
| | Describe sewer appurtenances required in maintaining a proper sewerage system. |
| | Explain the characteristics of waste water& characterize the waste water. |
| | Explain the effects of sewage disposal on streams & methods of disposal. |
| | Design proper Preliminary & primary waste water treatment works |
| | Design proper secondary waste water treatment works. |
| | Explain suitable sludge digestion methods, Reuse & Recycle of waste water. |
| Design of Steel Structures 10CV72 | Express advantages of steel structures and properties of structural steel compared to other construction materials. |
| | Describe various sections manufactured in rolled steel plant. |
| | Demonstrate behavior of structural steel under plastic analysis theory. |
| | Design various steel members and their connection using bolts or welds like beam beam or beam column connections. |
| | Design members subjected to tensile or compressive loads or subjected to moments. |
| | Design foundation using gusseted base, slab base or grillage foundation. |
| Estimation and Valuation 10CV73 | Evaluate drawings with estimates and discussing taking out quantities by different methods with appropriate units. |
| | Compute the cost by different estimation methods. |
| | Describe the specifications required for estimating, calling tenders etc. |
| | Compute the rates of different items of work from first principles. |
| | Compute the quantity of earthwork by different methods. |
| | Discuss the different departmental procedures such as inviting tenders, writing specifications, administrative approval, preparation of bills etc. |
| Design of Pre Stressed Concrete Structures 10CV74 | Define prestressed concrete, materials basic principles, stress concept, end anchorages and types of tensioning systems |
| | Nature of stresses in concrete and steel and also analyse stresses in concrete at working conditions |
| | Summarize the losses which occur in prestressed members and estimation of losses |
| | Discuss the factors influencing deflections and estimation of deflection |
| | Explain the types of Flexural failures, importance of strain compatibility method and estimation of ultimate flexural strength |
| | Describe principal stresses at support sections, estimation of ultimate shear strength and shear reinforcement |
| | Explain transfer of prestress in pretensioned, post tensioned members and stress distribution in End block |
| | Analyse and design of prestressing force, eccentricity and cable profile |

| Subject Name with Code | Course Outcomes |
|--|---|
| Advanced Design of RC 10CV752 | Design overhead water tanks and detailing of reinforcements. |
| | Analyse and design bunkers, silos and chimneys and detailing of reinforcements. |
| | Analyse the slab using yield line theory by virtual work and equilibrium methods.. |
| | Demonstrate the different forms and structural behaviors of shells and folded plates. |
| | Analyse and design grid floors and flat slabs and detail reinforcement using IS Codes. |
| Highway Geometric Design 10CV755 | Describe the general principles that govern highway geometric design. |
| | Analyze appropriate cross-section elements to suit the surrounding environment. |
| | Describe the IRC and AASHTO design standards for different types of sight distances. |
| | Design a highway for horizontal curves. |
| | Describe design standards for hilly roads. |
| | Describe different type of intersections. |
| | Design a rotary intersection. |
| | Apply basic hydraulic principles to drainage design. |
| Solid Waste Management 10CV757 | Explain scope and importance of solid waste management (SWM), functional elements of SWM, classifications and characteristics of different types of solid waste and will be able to quantify solid waste. |
| | Summarize the systems of collection and transfer of solid waste to the treatment facility with optimized routes of collection. |
| | Explain the different treatment and processing techniques used for SWM. |
| | Describe the incineration process, it's design, factors affecting , types and preventive methods for air pollution. |
| | Explain the different composting process and their implementation techniques. |
| | Describe the planning, design and operation of sanitary landfill. Analyze it's merits and demerits. |
| | Summarize different disposal methods for SW and Biomedical waste. |
| Numerical Methods in Civil Engineering 10CV761 | Knowledge of developing algorithms and finding solutions for linear simultaneous equations using various numerical methods. |
| | Knowledge and methods to formulate nonlinear algebraic equations. |
| | Exposure to solutions of civil engineering problems using numerical integration methods. |
| | Knowledge of use of numerical methods for finding solution to statically determinate and indeterminate beams. |
| | Knowledge of developing algorithm and finding solution for ordinary differential equations. |
| | Knowledge of methods of formulating finite difference equation and their application to solve structural mechanics problems. |
| | Knowledge of use of finite difference techniques to solve columns and foundation problems. |
| Air Pollution and Control 10CV765 | Define air pollution, characterize air pollutants and state the chemical reactions of pollutants in the atmosphere. |
| | Explain effects of air pollution on Human health, animals, plants & materials and outline some of the air pollution disasters. |
| | Explain the meteorological factors, their characteristics and influence on air pollution and state the plume behaviors. |
| | Identify the important factors required for Industrial location and explain the Noise pollution, its sources, effects and control measures. |
| | Describe the operational principles of air pollution measurement devices and state the theory and applications of Air pollution measurement instruments. |
| | Analyze effects of air pollution due to automobiles and state the control measures. |
| | Describe the effects of air pollution on the environment and explain some of the global air pollution issues. |
| | Define the Environmental Legislation and Identify the Water, Air and Noise pollution standards. |

| Subject Name with Code | Course Outcomes |
|---|--|
| Environmental Engg. Lab 10CVL77 | Conduct experiments on water and waste water. |
| | Handle and operate laboratory equipment, modern instrumentation, and classical techniques to carry out experiments. |
| | List out the glass wares and chemicals used for different water and waste water analysis |
| | Compare experimental result with standard values |
| | Describes the health effect of non potable water. |
| | Communicate the concepts and results of their laboratory experiments through effective writing and oral communication skills. |
| | Work in team |
| Concrete & Highway Materials lab.10CVL78 | Conduct the experiments on cement sample and can give results and conclusions with reference to IS specifications. |
| | Judge the quality of fresh concrete required for various construction practices depending upon its workability. |
| | Analyze the strength characteristics of Hardened concrete under compression and tension. |
| | Determine the density and CBR of soil required for construction of pavements. |
| | Explore the various sizes and shapes of coarse aggregates used in concrete and know their importance. |
| | Handle the experiments on Bitumen samples for knowing its basic properties and stability-flow value. |
| Advanced Concrete Technology 10CV81 | Explain the importance of chemistry of cement, Rheology of concrete, factors affecting strength and elasticity of concrete. |
| | Identify appropriate chemical admixture to suite a particular field conditions. |
| | Produce design mix proportion using different mineral and chemical admixtures as per IS-code and ACI-code specifications for the field requirements. |
| | Evaluate the behavior of concrete under different aggressive field condition. |
| | Implement the manufacturing process of concrete in RMC plant. |
| | Define the importance of different special concretes and its applications in construction industries. Demonstrate the tests on hardened concrete. |
| Design and Drawing of Steel Structures 10CV82 | Draw various sections like I or L. |
| | Draw connecting details of various members like beams, columns using bolts or welds. |
| | Design various elements of plate girders and gantry girders. |
| | Design roof truss members and their connections to gusset plates. |
| Advanced Pre-stressed Concrete Structures 10CV831 | Differentiate between investigations on stress end block and reinforcement required for end block |
| | Know the importance of shear strength and torsion shear stress and also computation of additional reinforcement |
| | Explain advantages and types of composite construction, evaluation of stresses and design of composite construction |
| | Identify the importance of circular prestressing and Analyse and Design cylindrical members |
| | Recognize importance of continuous beams effect of prestressing and concordant cable Design of continuous beams and portal frames. |
| | Describe compression members, biaxially loaded columns and design specifications. |
| | Identify types of floor slabs, analyse and design floor slabs Compare prestressed concrete elements, manufacturing techniques, shapes design loads and design principles, |
| Earthquake Resistant Design of Structures 10CV834 | Explain the principles of engineering seismology |
| | Achieve Knowledge of design and development of problem solving skills. |
| | Design and develop analytical skills. |
| | Summarize the Seismic evaluation and retrofitting of structures. Explain the concepts of earthquake resistance of reinforced concrete & Masonry buildings. |

| Subject Name with Code | Course Outcomes |
|---|--|
| Industrial Waste Water Treatment 10CV835 | Distinguish between Industrial waste water and Domestic waste water characteristics and explain the effect and disposal standards of Industrial waste water when discharged in Streams and Municipal sewage treatment plant. |
| | Analyze stream quality and compute D.O at various stages and at different water levels. |
| | Explain different pre-treatment methods and identify the final disposal method. |
| | Describe different aerobic and anaerobic treatment methods for removal of different types of solids. |
| | Analyze the feasibility of joint treatment of Industrial waste water and Domestic waste water. |
| | Summarize the characteristics, origin, effects of effluents generated from Cotton and Textile, Tanning, Sugar Cane & Distillery Industries and identify particular effluent treatment process for each industry. |
| | Summarize the characteristics, origin, effects of effluents generated from Dairy, Canning, Steel and Cement Industries and identify particular effluent treatment process for each industry. |
| | Summarize the characteristics, origin, effects of effluents generated from Paper &Pulp, Pharmaceutical and Food processing Industries and identify particular effluent treatment process for each industry. |
| Urban Transport Planning 10CV843 | To understand the Scope of urban transport planning, Inter dependency of land use and traffic flow |
| | To describe, Trip generationTrip productionTrip distribution&Trip assignment |
| | To Know the different types of surveys required for urban transportation, Zoning and Understand inventory of transportation facilities and Expansion of data from sample |
| | To study different factors governing trip generation and attraction and Purposes of trip |
| | To appreciate the concept of Growth factor methods,Synthetic methods and to solve problems independently on Frator and Furness method |
| | To study the Characteristics and factors affecting modal split |
| | To carry out Traffic forecasting and to know the applications of trip assignment in India |
| | To explore the practical difficulties in transport planning& to know recent case studies |