2018 Scheme

Sl.No	Branch	Sem	Subject	CO,S
1	CIVIL	3	Transform Calculus, Fourier Series and Numerical Techniques Mathematics (18MAT31)	1. To remember the definition of Laplace transform, Fourier series, Fourier transform, Z-transform formulae of numerical methods and calculus of variations.
				2. To understand the concept of periodic function ,unit step function, convolution theorem in Laplace transform Fourier series of period 2 pi, arbitrary period 2l ,Half range series, Z-transform, numerical methods and calculus of variations.
				3. To apply the concept of Laplace transform in second and higher order linear differential equations Harmonic analysis in Fourier series, Z-transform in difference equations, Numerical solution of ODE's by various methods and Euler's equation, Geodesics, in calculus of variations.
2		3	Strength of Materials (18CV32)	1. Evaluate the strength of various structural elements' internal forces such as compression, tension, shear, bending and torsion.
				2. Evaluate the behaviour and strength of structural elements under the action of compound stresses and thus understand failure concepts.

				3. Draw the bending moment and shear force diagrams for all types of beams with various loading conditions.
				4. Discuss the basic concept of analysis and design of members subjected to torsion, Bending and deflection of beams.
				5. Explain the basic concept of analysis and design of structural elements such as columns and struts.
3		3	Fluid Mechanics (18CV33)	1. Apply the fluid properties and concepts of pressure and its measurements and analyze the real world problems
				2. Analyze and solve the hydro-statics and kinematics of fluid problems
				3. Apply the principles of fluid dynamics in analyzing the real fluid flow problems
				4. Apply the flow measuring devices such as orifice, mouthpiece, notches and weirs in real situations
				5. Analyze and solve pipe flow problems, pipe network and surge in pipes
4		3	Building Materials and Construction (18CV34)	1. Identify and characterize different building materials and also enumerate different methods of construction.
				2. Investigation of soil condition and SBC to decide and design suitable foundation.
				3. Architectural design of staircase and different types of masonry.
				4. Distinguish and characterize the materials and supervision of different floors and roofs.
				5. Apply the knowledge of building finishing materials and components with modern construction methods.

5		3	Basic Surveying (18CV35)	1. Illustrate basic principle of surveying, determine the angle and distance using different survey instruments.
				2. Interpret the compass survey data, identify local attraction and apply corrections.
				3. Apply knowledge of levelling in determination of elevation of different objects.
				4. Enumerate various methods of plane table surveying and plotting, traversing by orientation method.
				5. Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours.
6		3	Engineering Geology (18CV36)	1. Apply geological knowledge in different civil Engineering practice.
				2. Students will acquire knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials.
				3. Civil engineers are competent enough for the safety, stability, economy and life of the structures that they construct.
				4. Solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems.
				5. Intelligent enough to apply GIS, GPS and Remote Sensing as a latest tool in different civil engineering construction.
7		3	Constitution of India, Professional Ethics and Cyber Law (18CPC39)	1. Have constitutional knowledge and legal literacy.
				2. Understand Engineering and Professional ethics and responsibilities of Engineers.
				3. Understand the cybercrimes and cyber laws for cyber safety measures.

8		3	Computer Aided Building Planning & Drawing (18CVL37)	1. Prepare, read and interpret the drawings in a professional set up.
				2. Know the procedures of submission of drawings and Develop working and submission drawings for building.
				3. Plan and design a residential or public building as per the given requirements.
9		3	Building Materials Testing Laboratory (18CVL38)	1. Asses the mechanical properties of structural materials
				2. Determine the hardness of ferrous and nonferrous metals
				3. Analyze the physical characteristics of various building materials
10		4	Additional Mathematics - 2 (18MATDIP41)	1. solve rank of matrix by elementary row operations - Echelon form. Consistency of system of linear equations - Gauss elimination method
				2. Demonstrate various physical models through 2 nd and higher order linear differential equation and solve such equations.
				3. Construct a variety of Partial differential equation and solution by direct integration, method of separation of variables.
				4. Apply the knowledge of numerical methods ,infinite series and series solution of ordinary differential equation to explain various physical and engineering problems
11		4	Complex Analysis, Probability And Statistical Methods (18MAT41)	1. Remember the concept of probability to solve the problems on probability distribution and joint probability distribution.
				2. Understand the concept of correlation, regression and curve fitting.
				3. Demonstrate testing of hypothesis of sampling distribution.

				4. Apply the knowledge of complex differentiation and complex integration in diverse fields related to field theory and signal processing.
12		4	Analysis of Determinate Structures (18CV42)	1. Identify different forms of structural systems with Static & Kinematic Indeterminacy; Understand Concepts of influence lines-ILD for reactions, SF and BM for determinate beams & trusses.
				2. Construct ILD and analyse the beams and trusses subjected to moving loads.
				3. Understand the Moment area & Conjugate beam theorems and its applications to determine the rotation and deflections of beams.
				4. Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and beams.
				5. Determine the stress resultants in arches and cables.
13		4	Applied Hydraulics (18CV43)	1. Apply dimensional analysis to develop mathematical modelling and compute the parametric values in prototype by analyzing the corresponding model parameters.
				2. Design the open channels of various cross sections including economical channel sections
				3. Apply energy concepts to flow in open channel sections, calculate energy dissipation and to compute water profiles at different conditions.
				4. Apply the laws of physics to calculate the force exerted by the water jet on vanes.
				5. Design turbines for the given data, and to know their operation characteristics under different operating conditions

14		4	Concrete Technology (18CV44)	1. Analyze the functional role of ingredients of concrete and relate material characteristics and their influence on micro structure of concrete.
				2. Examine the concrete behaviour on its fresh and hardened properties.
				3. Design a concrete mix for field applications as per professional codes by applying the mix proportion principles.
				4. Evaluate the effects of environment on the service life performance, properties and failure modes of structural concrete.
				5. Recognize the characteristics of special types of concrete.
15		4	Advanced Surveying (18CV45)	1. Apply the knowledge of geometric principles in analyzing height and distance to arrive at surveying problems
				2. Interpreting aerial photo by photogrammetry to obtain geo-spatial data and analyse the same to appropriate engineering problems.
				3. Analyze remote sensing and GIS data for survey problems with the use of electronic instruments,
				4. Design and implement the different types of curves for deviating type of alignments.
16		4	Water Supply & Treatment Engineering (18CV46)	1. Forecast the future population data and water demands required to design an efficient Water Supply Scheme.
				2. Compare and choose suitable source of water for a given locality.
				3. Assess the results to quantify physical, chemical and biological impurities present and design various treatment plant units.
				4. Determine the optimum dosage of chemicals required to treat the raw water and design various treatment units.

				5. Plan a water distribution network of the water supply line for residential buildings
17		4	Engineering Geology Laboratory (18CVL47)	1. The students able to identify the minerals, rocks and utilize them effectively in civil engineering practices.
				2. The students will interpret and understand the geological conditions of the area for implementation of civil engineering projects.
				3. The students will interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
				4. 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.
				5. The students will be able to identify the different structures in the field.
18		4	Fluid Mechanics and Hydraulic Machines Laboratory (18CVL48)	1.The use of various instruments for fluid flow measurement
				2.Working of Hydraulic machines under various conditions of working
19		5	Construction Management & Entrepreneurship (18CV51)	1. Analyze and understand the construction management process along with different scheduling techniques.
				2. Perceive and solve variety of issues that are encountered by every professional in discharging professional duties.
				3. Realize the professional obligations effectively with global outlook.
				4. Analyze the entrepreneurship process and opportunities available to become an entrepreneur with knowledge of economics.
20		5	Analysis of Indeterminate Structures (18CV52)	1. Determine the moment in indeterminate beams and frames having variable moment of

				inertia and subsidence using slope defection method
				2. Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
				3. Construct the bending moment diagram for beams and frames by Kani's method.
				4. Construct the bending moment diagram for beams and frames using flexibility method
				5. Analyze the beams and indeterminate frames by system stiffness method.
21		5	Design of RC Structural Elements (18CV53)	1. Use the design philosophy of RCC structural elements by limit state design.
				2. Solve the engineering problems of RC beams subjected to flexure, shear and torsion
				3. Design the RC Structural elements of slabs, columns, footing and staircase
				4. Analyze the culture of practicing the codes for evaluation of strength, serviceability and durability of RC structures.
22		5	Basic Geotechnical Engineering (18CV54)	1. Determine the index properties and classify the soils
				2. Draw compaction curve of soil and apply the knowledge of compaction in field.
				3. Compute the flow of water through soils.
				4. Determine shear strength and Consolidation parameters of soil
23		5	Municipal Wastewater Engineering (18CV55)	1. Estimate the quantity of flow in sewer, select appropriate sewer materials, and learn laying and testing of sewers, low cost treatment methods and house drainage connection.
				2. Design the sewers and Assess the waste water characteristics.

				3. Design wastewater treatment units by applying appropriate treatment methods and Evaluate self-purification of streams.
				4. Design and illustrate the importance of biological treatment of waste water.
				5. Illustrate the need of advanced wastewater treatment technologies and Execute proper rural sanitation planning.
24		5	Highway Engineering (18CV56)	1. Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
				2. Evaluate the Engineering properties of the materials and suggest the suitability of the same for pavement construction.
				3. Design road geometrics , structural components of pavement and drainage.
				4. Evaluate the highway economics by few selective methods also will have a basic knowledge of various highway financing concepts.
25		5	Environmental Studies (18CIV59)	1. Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
				2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
				3. Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.
				4. Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

26		5	Surveying Practice (18CVL57)	1. Apply the knowledge of surveying in setting out geometric shapes with chain and compass surveying principles.
				2. To determine the distance and difference in elevation of the given object by levelling.
				3. To determine the depth of cut and depth of fill for given formation level.
				4. To determine the height of an object by theodolite survey through single and double plane method.
				5. To determine tachometric constant by theodolite.
				6. To determine the distance and area using plane table surveying.
27		5	Concrete and Highway Materials Laboratory (18CVL58)	1. Determine the quality and suitability of cement, normal concrete and self-compacting concrete
				2. Test the road aggregates and bitumen for their suitability as road material.
				3. Test the soil for its suitability as subgrade soil for pavements.
28		6	DESIGN OF STEEL STRUCTURAL ELEMENTS (18CV61)	1. Possess a knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel
				2. Understand the Concept of Bolted and Welded connections.
				3. Understand the Concept of Design of compression members, built-up columns and columns splices.
				4. Understand the Concept of Design of tension members, simple slab base and gusseted base.
				5. Understand the Concept of Design of laterally supported and un-supported steel beams.

29		6	APPLIED GEOTECHNICAL ENGINEERING (18CV62)	1. Identify the methods of Subsurface exploration and dewatering.
				2. Compute the stresses in soil.
				3. Analyze the slope stability and determine the lateral earth pressure of soil.
				4. Determine the bearing capacity and settlements of soil.
30		6	HYDROLOGY AND IRRIGATION ENGINEERING (18CV63)	1. Explain the importance of hydrology and its components.
				2. Analyze the data and the losses in precipitation
				3. Estimate runoff and develop unit hydrographs to perform Flood forecasting.
				4. Evaluate the benefits, ill-effects of irrigation and find the quantity of irrigation water and frequency of irrigation for various crops.
				5. Design the canal and compute the reservoir capacity.
31		6	Solid Waste Management (18CV642)	1. Analyze the composition of solid waste and distinguish the collection and transportation means for solid waste management.
				2. Illustrate the processing systems of solid waste management.
				3. Describe the scientific management of Hazardous and Non-Hazardous waste.
				4. Design a suitable processing system for solid waste management elements.
32		6	Railway,harbours,tunnelling & Airports (18CV645)	1. Acquires capability of choosing alignment and also design geometric aspects of railway system, runway and taxiway.
				2. 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.

				3. 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
				4. Apply the knowledge gained to conduct surveying, understand the tunnelling activities.
33		6	Traffic Engineering (18CV652)	1. Analyze the human factors and vehicular factors in traffic engineering design and Traffic flow parameters
				2. Conduct different types of traffic surveys and analysis of collected data using statistical concepts
				3. Design the traffic signals and Intersections and distinguish various visual aids of traffic and choose appropriate traffic control devices
				4. Comprehend various traffic safety measures and mitigations
				5. Explain Traffic Management Techniques available to manage the traffic flow
34		6	Software Application Laboratory (18CVL66)	1. Use industry standard software in a professional set up.
				2. Understand the elements of finite element modelling ,specification of loads and boundary condition, performing analysis and interpretation of results for final design
				3. Develop customized automation tools
35		6	Environmental Engineering Laboratory (18CVL67)	1. Determine the physical, chemical and biological characteristics of water and wastewater.
				2. Determine the optimum dosage of coagulant for a given water and waste water sample.
				3. Estimate the percentage of available chlorine in a given bleaching powder sample and also to determine residual chlorine in a treated municipal water sample.

				4. Design Sedimentation tank dimensions through Total Solids Test and Quantify the ambient air pollutant concentrations and to measure the noise levels in and around the society.
36		6	Extensive Survey Project (18CVEP68)	1.To understand the practical applications of surveying by using total station in teams and also to learn time mangement and communication skills
37		7	Quality Surveying and Contract Management (18CV71)	1. Prepare detailed and abstract estimates for roads and buildings.
				2. Develop the specification for different items of work in a building & Analyze the rate of items of work based on material and workmanship.
				3. Interpret Contract documents of domestic and international construction works.
				4. Prepare valuation reports of buildings.
38		7	Design of RCC and Steel Structures (18CV72)	1.Provide basic knowledge in the areas of limit state method and concept of design of RC and Steel structures
				2.Identify, formulate and solve engineering problems in RC and Steel Structures
				3.Give procedural knowledge to design a system, component or process as per needs and specifications of RC C structures
				4. Imbibe the culture of professional and ethical responsibilities by following codal provisions in the analysis, design of RC and Steel Structures.
				5. Provide factual knowledge on analysis and design of RC Structural elements, who can participate and succeed in competitive examinations
39		7	Ground Water & Hydraulics (18CV742)	1. Define the geological stratum and summarize the characteristics of aquifers.

				2. Determine the various Aquifer parameters to assess ground water.
				3. Interpreting the uni-directional, radial flow for steady, unsteady conditions of an aquifers and examining the aquifer parameters by analytical and graphical methods.
				4. Locate the zones of ground water resources and estimate the quantity of ground water in subsurface strata through geophysical exploration.
				5. Select particular type of well based on suitability and augment the ground water storage by adopting various ground water recharge technique.
40		7	Air Pollution and Control (18CV732)	1. Solve the problems associated with air pollution impact on human health, plants, animals and materials.
				2. Apply the basic principles and theoretical approaches to contribute towards the meteorological parameters in deriving air quality models.
				3. Choose an appropriate sampling and analysis techniques for gaseous as well as particulate air pollutants.
				4. Propose air pollution control techniques applicable to particulate and gaseous air pollutant.
				5. Describe the effects of air pollution due to automobiles, control measures of noise pollution, environmental policies, acts and standards.
41		7	Ground Water Hydraulics (18CV734)	1. Define the geological stratum and summarize the characteristics of aquifers.
				2. Determine the various Aquifer parameters to assess ground water.

				3. Interpreting the uni-directional, radial flow for steady, unsteady conditions of an aquifers and examining the aquifer parameters by analytical and graphical methods.
				4. Locate the zones of ground water resources and estimate the quantity of ground water in subsurface strata through geophysical exploration.
				5. Select particular type of well based on suitability and augment the ground water storage by adopting various ground water recharge technique.
42		7	Design of Hydraulic Structures (18CV744)	1. Check the stability of gravity dam
				2. Estimate the quantity of seepage by Casagrande's method through earth dams
				3. Design spillway and aprons for diversion works
				4. Determine the type of canal regulation work for canal network
43		7	Urban Transport Planning (18CV745)	1. Design, conduct and administer surveys to provide the data required for transportation planning
				2. Supervise the process of data collection about travel behavior and analyze the data for use in transport planning
				3. Develop and calibrate modal split, trip generation rates for specific types of land use developments
				4. Adopt the steps that are necessary to complete a long-term transportation plan
44		7	Numerical Methods and Applications (18CV752)	1. Determine numerically the solution of linear system of equations using Gauss elimination method, Gauss Jordan method and iterative methods

				2. Express an approximate interpolating polynomials for equal and unequal intervals using Lagrange's interpolation, Newton's divided difference interpolation, Newton's forward and backward difference formulae.
				3. Evaluate the Numerical integration using Trapezoidal, Simpson's 1/3 rule , Romberg's method ,Two point and three point Gaussian quadrature formulae
				4. Solve Initial Value Problems for Ordinary Differential Equations using Taylor's series method - Euler's method - Modified Euler's method – Fourth order Runge-Kutta method, Milne's and Adams-Bash forth predictor corrector methods for First order differential equations.
				5. Solve Boundary Value Problems in Ordinary and Partial Differential Equations using Finite difference techniques, explicit and implicit methods.
45		7	Computer Aided Detailing Of Structures (18CVL76)	1. Be aware of the Scale Factors, Sections of drawings,
				2. Draft the detailing of RC and Steel Structural member.
46		7	Geotechnical Engineering Laboratory (18CVL77)	1. Identify the different types of soil.
				2. Determine the index properties to classify the soil.
				3. Assess the strength properties of soil.
				4. Demonstrate auger samplers, rapid moisture meter, swell pressure test and standard penetration test.
47		7	Project Work Phase 1 (18CVP78)	1. Identify the requirements of real world problems and articulate the appropriate literature review by analyzing previous researchers' work.

				2. Formulation of Project objective with respect to literature review and construct methodology
				3. Demonstrate an ability to work in teams and manage the conduct of the research study
				4. Prepare report and present the synopsis of the project using good oral and written skills.
48		8	Design of Pre-stressed Concrete (18CV81)	1. Apply the provisions of IS 1343 1980 code to the design of flexure and shear of pre stressed concrete structures.
				2. Perceive the concept of pre-stressing and analyze the behaviour of concrete structures
				3. Determine the losses of pre-stress in pre-stressed concrete structures
				4. Analyze the deflection of beams and camber of pre-stressed concrete members and design the end blocks.
49		8	Rehabilitation & Retrofitting (18CV824)	1. Understand the cause of deterioration of concrete structures.
				2. Able to assess the damage for different type of structures
				3. Summarize the principles of repair and rehabilitation of structures
				4. Recognize ideal material for different repair and retrofitting technique
50		8	Pavement Design (18CV825)	1. Systematically generate and compile required data's for the design of pavement
				2. Compute the stresses and deflection in flexible and rigid pavements
				3. Design of flexible and rigid pavements
				4. Evaluate the pavement distresses and recommend maintenance measures for flexible and rigid pavements
51		8	Project Work Phase - 2 (18CVP83)	1. Develop critical thinking and problem solving skills

				2. Adequately adopt the methodologies to achieve defined objectives of the project work undertaken
				3. Evaluate the outcome of the work taken and its impact on the societal needs
				4. Demonstrate an ability to work in teams and manage the conduct of research study
				5. Organize and compile the work done in the research topic, prepare report and present outcome of the project using good oral and writing skills
52		8	Technical Seminar (18CVS84)	1. Acquire skills to carry out a literature survey.
				2. Summarize the study carried out in emerging areas of Civil Engineering.
				3. Present the outcomes using good communication skills.
				4. Organize and compile the outcomes using good written skills.

2021 Scheme

Sl.No	Branch	Sem	Subject	CO,S
1	CIVIL	3	Transform Calculus, Fourier Series and Numerical Techniques (21MAT31)	1. To solve ordinary differential equations using Laplace transform
				2. Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
				3. To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations

				4. To solve mathematical models represented by initial or boundary value problems involving partial differential equations
				5. Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
2		3	Geodetic Engineering (21CV32)	1. To develop skills of plane surveying by compass and plane table methods.
				2. To determine the elevation of objects with levelling and compute areas and volumes
				3. To determine linear measurements of theodolite survey.
				4. To design compound, transition and reverse curve.
				5. To solve survey problem by remote sensing and GIS data using LiDAR and Drone.
3		3	Strength of Materials (21CV33)	1. Evaluate the behavior when a solid material is subjected to various types of forces namely (Compressive, Tensile, Thermal, Shear, flexure, Torque, internal fluid pressure) and estimate stresses and corresponding strain developed.
				2. Estimate the forces developed and draw a schematic diagram for stresses, forces, moments for simple beams with different types of support and are subjected to various types of loads
				3. Evaluate the behaviour when a solid material is subjected to Torque and internal fluid pressure and estimate

				stresses and corresponding strain developed.
				4. Distinguish the behaviour of short and long column and calculate load at failure & explain the behaviour of spring to estimate deflection and stiffness
				5. Examine and Evaluate the mechanical properties of various materials under different loading conditions
4		3	Earth Resources and Engineering (21CV34)	1. Apply geological knowledge in different civil engineering practice
				2. Students will acquire knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials
				3. competent enough to provide services for the safety, stability, economy and life of the structures that they construct
				4. Able to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems
				5. Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering for safe and solid construction.
5		3	Fire Safety in Buildings (21CV385)	1. To analyze the importance fire safety
				2. To learn techniques involved in fire safety
				3. To design fire resistant buildings
6		3	Computer Aided Building Planning and Drawing (21CVL35)	1. Able to interpret the drawings in a professional set up.
				2. Able to draw the residential or public building as per the requirement.

				3. Able to create sanction drawings as per bye-laws
7		3	Social Connect and Responsibility (21SCR36)	1. Understand social responsibility
				2. Practice sustainability and creativity
				3. Showcase planning and organizational skills
8		4	Maths for Communication Engineers (21MAT41)	1. Use the concept of Analytic function and complex potential to solve the problems in electromagnetic theory and complex integration in air foil and image processing.
				2. Obtain series solution ODEs
				3. Fit an appropriate mathematical model for the statistical data by using correlation and regression analysis.
				4. Apply discrete and continuous probability distribution in engg. field
				5. Construct joint probability distribution and testing the hypothesis
9		4	Fluid Mechanics and Hydraulics (21CV42)	1.Design of turbines for the given data and understand their operation characteristics
				2.Apply Principles of Mathematics to represent Kinematics and Bernoulli's principles
				3.Compute discharge through pipes, notches and weirs
				4.Design of open channels of various cross sections
				5.Design of turbines for the given data and understand their operation characteristics
10		4	Public Health Engineering (21CV43)	1. Forecast the future population data and water demands required to design an efficient Water Supply Scheme.

				2. Assess the results to quantify physical, chemical and biological impurities present and design various water treatment plant units.
				3. Assess the waste water characteristics.
				4. Design wastewater treatment units by applying appropriate treatment methods.
				5. Design and illustrate the importance of biological treatment of waste water.
11		4	Analysis of Structures (21CV44)	1. Evaluate slope and deflections in beams using geometrical methods.
				2. Determine deflections in trusses and frames using energy principles.
				3. Analyse arches and cables for stress resultants.
				4. Apply slope defection method in analysing indeterminate structures and construct bending moment diagram.
				5. Analyse continuous beams, frames and trusses using stiffness matrix method of analysis.
12		4	Universal Human Values (21UH49)	1. Holistic vision of life and Socially responsible behavior
				2. Environmentally responsible work and Ethical human conduct
				3. Having Competence and Capabilities for Maintaining Health and Hygiene
				4. Appreciation and aspiration for excellence (merit) and gratitude for all
13		4	Constitution of India and Professional Ethics (21CIP47)	1.Analyse the basic structure of Indian Constitution

				2. Remember their fundamental rights, DPSP's and fundamental duties (FD's) of our constitution
				3. Know about our Union Government, Political Structure & codes, procedures
				4. Understand our State Executive & Election system of India
				5.Remember the Amendments and Emergency Provisions, other important provisions given by the constitution
14		4	Green Building (21CV485)	1. Understand the Definition, Concept & Objectives of the terms cost effective construction and green building.
				2. Apply cost effective Technologies and Methods in Construction.
				3. Understand the Problems due to Global Warming.
				4. Asses the green buildings using different Green Building rating Systems.
				5. Analyze the Utility of Solar Energy and Green Composites for green buildings.
15		4	Engineering Geology Lab (21CVL46)	1. Comprehend the relations between minerals and rocks based on their physical properties
				2. Assess the suitability of materials used in building construction
				3. Differentiate geological investigations necessary for the construction of dams, bridges, and tunnels
				4. Describe the groundwater investigation using resistivity methods

				5. Understand the applications of Geospatial technology in Civil Engineering.
16		4	Additional Mathematics I (21MATDIP41)	1. Solve rank of matrix by elementary row operations - Echelon form. Consistency of system of linear equations - Gauss elimination method
				2. Demonstrate various physical models through 2^{nd} and higher order linear differential equation and solve such equations.
				3. Construct a variety of Partial differential equation and solution by direct integration, method of separation of variables.
				4. Apply the knowledge of numerical methods, infinite series and series solution of ordinary differential equation to explain various physical and engineering problems