

COURSE CODE	COURSE NAME	COS	COURSE OUTCOMES
17MA1101	MATRICES AND DIFFERENTIAL CALCULUS	CO1	Determine Eigen values, Eigen vectors of a matrix.
		CO2	Estimate Maxima and Minima of Multi Variable Functions
		CO3	Solve the Linear differential equations with constant coefficients.
		CO4	Solve the Linear differential equations with variable coefficients.
17CH1102	ENGINEERING CHEMISTRY	CO1	Analyze various water treatment methods and boiler troubles.
		CO2	Apply the knowledge of different phases in materials, working principle of electrodes and batteries and their application in chemical and other engineering areas
		CO3	Evaluate corrosion processes as well as protection methods.
		CO4	Apply the knowledge of nature of polymeric materials for their application in technological fields and of fuels for their conservation
17CS1103	PROBLEM SOLVING METHODS	CO1	Understand the Computer problem solving approaches, efficiency and analysis of algorithms
		CO2	Apply the factoring methods to solve the given problem
		CO3	Apply the array techniques to find the solution for the given problem
		CO4	Solve the problems using MATLAB
		CO1	Analyze coplanar concurrent forces

17ME1104A	ENGINEERING MECHANICS-I	CO2	Analyze coplanar parallel forces and determine centroids for plane figures.
		CO3	Analyze coplanar general case of force systems
		CO4	Analyze spatial concurrent and parallel forces
17ME1105/17 ME1205	ENGINEERING GRAPHICS	CO1	Understand the Scales, conics and Cycloidal curves.
		CO2	Draw Orthographic projections of points, Lines, Planes and Solids
		CO3	Understand Sectional views of Solids, Development of surfaces and their representation
		CO4	Construct isometric scale, isometric projections ,isometric views and convert pictorial views to orthographic projections
17CH1151 / 17CH1251	ENGINEERING CHEMISTRY LABORATORY	CO1	Analyze quality parameters of water samples from different sources
		CO2	Perform quantitative analysis using instrumental methods.
		CO3	Apply the knowledge of mechanism of corrosion inhibition, metallic coatings and photochemical reactions.
17CS1152	COMPUTING AND PERIPHERALS LABORATORY	CO1	Understand and Apply MS Office tools
		CO2	Configure the components on the motherboard and install different operating systems
		CO3	Understand and configure different storage media
		CO4	Perform Networking, troubleshooting and system administration tasks
17MC1106B	PROFESSIONAL ETHICS & HUMAN VALUES	CO1	Know the moral autonomy and uses of ethical theories.
		CO2	Understand morals, Honesty and character.
		CO3	Understand about safety, risk and professional rights.
		CO4	Know the ethics regarding Global issues related to Environment, Computers and weapon's development.
17MC1106/17 MC1206	PROFESSIONAL ETHICS &	CO1	Know the moral autonomy and uses of ethical theories.
		CO2	Understand morals, Honesty and character.

	HUMAN VALUES	CO3	Understand about safety, risk and professional rights.
		CO4	Know the ethics regarding Global issues related to Environment, Computers and weapon's development.
17MA1201	LAPLACE TRANSFORMS AND INTEGRAL CALCULUS	CO1	Solve Linear Differential Equations using Laplace Transforms.
		CO2	Examine the nature of the Infinite series.
		CO3	Evaluate areas and volumes using Double, Triple Integrals.
		CO4	Convert Line Integrals to Area Integrals and Surface Integrals to Volume Integrals.
17PH1202	ENGINEERING PHYSICS	CO1	Analyse and understand various types of crystal structures and their characterization.
		CO2	Understand various concepts of acoustics and thermal performance.
		CO3	Understand the classification, properties, preparation and applications of various engineering materials.
		CO4	Understand the fabrication of nanomaterials and carbon Nanotubes.
17CS1203	PROGRAMMING IN C	CO1	Understand the fundamentals and structure of a C programming language
		CO2	Apply the loops, arrays, functions and string concepts in C to solve the given problem.
		CO3	Apply the pointers and text input output files concept to find the solution for the given applications.
		CO4	Use the Enumerated, Datatypes, Structures and Unions.
17ME1204	ENGINEERING MECHANICS – II	CO1	Analyze the rectilinear motion of particles.
		CO2	Analyze the curvilinear motion of particles.
		CO3	Evaluate the moment of inertia of areas and material bodies.
		CO4	Analyze the motion of rigid bodies.
17HS1205	TECHNICAL	CO1	Develop administrative and professional compilations including web related(On-line) communication with felicity of expression

	ENGLISH & COMMUNICATION SKILLS	CO2	Demonstrate Proficiency in Interpersonal Communication, in addition to standard patterns of Pronunciation
		CO3	Apply the elements of functional English with sustained understanding for authentic use of language in any given academic and/or professional environment
		CO4	Execute tasks in Technical communication with competence
17MC1206A	TECHNOLOGY AND SOCIETY	CO1	Understand the origins of technology and its role in the history of human progress.
		CO2	Know the Industrial Revolution and its impact on Society
		CO3	Interpret the developments in various fields of technology till Twentieth Century.
		CO4	Distinguish the impacts of Technology on the Environment and achievements of great scientists.
17PH1251	ENGINEERING PHYSICS LABORATORY	CO1	Use spectrometer and travelling microscope in various experiments
		CO2	Determine the V-I characteristics of solar cell and photo cell and appreciate the accuracy in measurements
		CO3	Test optical components using principles of interference and diffraction of light
17CS1252	COMPUTER PROGRAMMING LABORATORY	CO1	Implement the use of programming constructs in a structured oriented programming language
		CO2	Implement conditional and iterative statements through C Language
		CO3	Analyze and implement user defined functions to solve real time problems
		CO4	Implement the usage of pointers and file operations on data
		CO5	Implement the user defined data types via structures and unions to solve real life problems
17ME1253	BASIC WORKSHOP	CO1	Model and develop various basic prototypes in the Carpentry trade.
		CO2	Develop various basic prototypes in the trade of Welding.
		CO3	Model and develop various basic prototypes in the trade of Tin Smithy.
		CO4	Familiarize with various fundamental aspects of house wiring.

17MA1301A	COMPLEX ANALYSIS & NUMERICAL METHODS	CO1	Determine analytic and non analytic functions and understand the concept of complex integration.
		CO2	Analyze Taylor and Laurent series and evaluation of real definite integrals using residue theorem and understand the concept of transformations.
		CO3	Solve Algebraic and transcendental, system of equations and understand the concept of polynomial interpolation.
		CO4	Understand the concept of Numerical differentiation and integration. Solve initial and boundary value problems numerically.
17CE3302	INTRODUCTION TO MECHANICS OF SOLIDS	CO1	Describe the concepts and principles, understand the theory of elasticity including strain/displacement and Hooke's law relationships;
		CO2	Define the characteristics and calculate the magnitude of principal stresses and strain, shear force and bending moment diagrams.
		CO3	Calculate the bending stresses and deflection at any point on a beam subjected to a combination of loads.
		CO4	Understanding the shear stress in beams, torsion in shafts and spring
17CE 3303	FLUID MECHANICS	CO1	Measure the pressure of the flowing fluid.
		CO2	Understand the kinematic and dynamic behavior of flow.
		CO3	Measure the flow of fluid through pipes and Orifices/ Mouthpieces.
		CO4	Analyze the flow through pipes.
17CE3304	SURVEYING & GEOMATICS	CO1	Understand the principles of surveying.
		CO2	Measure horizontal and vertical angles in surveying.
		CO3	Compute areas and volumes of a given section
		CO4	Understand the concepts of leveling and location of contour.
		CO5	Understand the principles of modern field survey system.
		CO6	Setting out of a simple curve.
	ENGINEERING	CO1	Acquire basic knowledge on geology in civil engineering

17CE3305	GEOLOGY	CO2	Understand the geological process influence the civil engineering projects
		CO3	Understand the geological and geophysical methods for planning and designing projects
		CO4	Identify the solution of geological problems in the context of major civil engineering projects
17TP1306	LOGIC & REASONING	CO1	Think reason logically in any critical situation
		CO2	Analyze given information to find correct solution
		CO3	To reduce the mistakes in day to day activities in practical life
		CO4	Develop time-management skills by approaching different shortcut methods
		CO5	Use mathematical based reasoning to make decisions
		CO6	Apply logical thinking to solve problems and puzzles in qualifying exams in any competitive exam.
17CE3351	SURVEYING LABORATORY	CO1	Determine the areas by using linear measurement methods.
		CO2	Plot the traverse and determine the bearings by using Compass.
		CO3	Project the traverse from ground, on to the sheet by using plane table
		CO4	Determine the horizontal & vertical angles by using Theodolite.
		CO5	Determine the elevations by using different leveling instruments.
17CE3352	STRENGTH OF MATERIALS LABORATORY	CO1	Do tests on steel and find its properties to ascertain suitability as per IS codes of practice.
		CO2	Conduct tests on wood as per IS Codes of practice and its use in works
		CO3	Evaluate the strains and stresses experimentally using electrical resistance strain gauges.
17CE3353	ENGINEERING GEOLOGY LABORATORY	CO1	Identify the common rocks and minerals and their engineering properties
		CO2	Interpret the subsurface geological structures using models
		CO3	Practice the topographic and geologic cross section
		CO4	Calculate the engineering parameters from the rock samples

17MC1307 B	INDIAN CONSTITUTION	CO1	Know the fundamental law of the land
		CO2	Understand how fundamental rights are protected
		CO3	Perceive the structure and formation of the Indian Government System
		CO4	Explain when and how an emergency can be imposed and what are the consequences.
17CE3401	BUILDING MATERIALS & BUILDING CONSTRUCTION	CO1	Understand physical properties, uses, manufacturing processes of building materials that are used in structural components.
		CO2	Understand application of protective materials for structural members.
		CO3	Distinguish different types of constructional procedures for different components of a building.
		CO4	Apply the knowledge of different support systems for construction and repairs.
17CE3402	CONCRETE TECHNOLOGY	CO1	Understand the manufacturing process of cement, types of cements and chemical composition of cement
		CO2	Understand the properties of the constituent materials in concrete
		CO3	Know the properties of fresh and hardened concrete including strength and durability.
		CO4	Understand various concreting methods.
		CO5	Design concrete mixes using Indian Standard method and apply statistical quality control techniques to concrete quality.
17CE3403	MECHANICS OF MATERIALS	CO1	Understand the analysis of trusses and cylinders
		CO2	Understand the compound stresses and behaviour of columns under various end conditions
		CO3	Understand the various failure theories, strain energy, shear centre and composite beams
		CO4	Understand the energy methods used to derive the equations to solve engineering problems

17CE3404	HYDRAULICS & HYDRAULIC MACHINES	CO1	Determine the most economical dimensions of different channel sections.
		CO2	Analyze the flow through an open channel.
		CO3	Formulate an equation for a phenomenon using dimensional analysis.
		CO4	Analyze and select suitable type of turbine / Pump.
17TP1405	ENGLISH FOR PROFESSIONALS	CO1	Present themselves effectively in the professional world
		CO2	Introduce themselves as well as others appropriately.
		CO3	Use vocabulary to form sentences and narrate stories by using creative thinking skills
		CO4	Involve in practical activity oriented sessions.
		CO5	Learn about various expressions to be used in different situations.
		CO6	Respond positively by developing their analytical thinking skills.
17HS2406/A	Yoga & Meditation	CO1	Equip better attitude and behaviour.
		CO2	Imbibe set of values enabling a balanced life focused on an ethical material life.
		CO3	Develop levels of concentration through mediation
		CO4	Apply conscience for the missions of life
17HS2406/D	Philosophy	CO1	Understand major philosophical issues.
		CO2	Appreciate the philosophical doctrines of western thinkers.
		CO3	Understand the eminence of Indian classical thought.
		CO4	Appreciate relation between science and values.
17HS2406/I	Foreign Language (German)	CO1	Learn basics of German Language.
		CO2	Write German Writing
		CO3	Understand German Hearing
		CO4	Form sentence in Present , past and future tense
17HS2406/K	Psychology	CO1	Relate biological and socio-cultural factors in understanding human Behaviour.
		CO2	Understand the nature of sensory processes, types of attentions.
		CO3	Explain different types of learning and the procedures, distinguishes between

			different types of memory,
		CO4	Demonstrate An understanding of some cognitive processes involved in Problem solving and decision-making.
17CE3451	FLUID MECHANICS AND HYDRAULIC MACHINES LAB	CO1	Determine the total energy at various sections of pipe flow and Classify different types of flows.
		CO2	Determine the discharge through tanks and pipes
		CO3	Determine the discharge through Open channel.
		CO4	Determine the performance of various Hydraulic machines
17CE3452	BUILDING PLANNING AND DESIGN LABORATORY	CO1	Acquire the knowledge of Various measurements and dimensions of a building components
		CO2	Understand principles of planning, principles of architecture and building bye-laws.
		CO3	Draw the line diagrams as per National Building Code
		CO 4	Draw the plan, elevation, sectional view of the building as per principles of planning
17HS1453	COMMUNICATION SKILLS LABORATORY	CO1	Execute rational pronunciation of speech sounds including accentuation.
		CO2	Apply elements of listening comprehension in professional environments.
		CO3	Develop the abilities of rational argumentation and skills of public speaking.
		CO4	Demonstrate proficiency in the elements of professional communication including the competitive examination
17MC1407A	ENVIRONMENTAL STUDIES	CO1	Understand the various natural resources, analyze and explore degradation management
		CO2	Understand the Ecosystems and need of Biodiversity
		CO3	Realize and Explore the Problems related to Environmental pollution and its management

		CO4	Apply the Role of Information Technology and analyze social issues, Acts associated with Environment.
17CE3501	WATER RESOURCES ENGINEERING	CO1	understand various irrigation methods and Irrigation management practices in the field.
		CO2	evaluate the Run-off and evaluate the ground water yield.
		CO3	evaluate and Design of various Channel sections.
		CO4	evaluate reservoir capacity and summarize various types of hydraulic structures
17CE3502	ENVIRONMENTAL ENGINEERING	CO1	understand source of water for water supply scheme with reference to quantity and quality of water
		CO2	understand and apply the methods of treatment for purification of water
		CO3	analyse the distribution of water
		CO4	understand the concepts of collection & conveyance, Quality and quantity of sewerage
		CO5	apply appropriate treatment and disposal methods of sewage and septage
17CE3503	STRUCTURAL ANALYSIS	CO1	draw and interpret influence line diagrams
		CO2	apply energy methods for analysis of indeterminate beams and frames
		CO3	analyze statically indeterminate structures using force and displacement methods
		CO4	analyze multistory frames for vertical and horizontal loads by approximate methods
17CE2504/A	GEOSPATIAL TECHNOLOGIES	CO1	apply the recent advances GIS technology in various fields of engineering
		CO2	evaluate the opportunities and available methods for integrating GIS in various engineering applications
		CO3	understand large scale maps using satellite imageries.
17CE2504/B	QUALITY CONTROL AND QUALITY	CO1	understand meaning of quality, quality standards
		CO2	apply provisions of IS codes
		CO3	apply QC techniques

	ASSURANCE	CO4	analyze methods to improve quality
17CE2505/A	AIR AND NOISE POLLUTION	CO1	understand various types of air pollutants and their effects
		CO2	understand the dispersion phenomenon of air pollutants with regard to meteorological parameters
		CO3	analyse the samples, pollutants from chimney stacks and ambient atmosphere
		CO4	understand the various types of air pollution controlling equipment
		CO5	understand the sources and controlling measures of noise pollution
17CE2505/B	ENVIRONMENTAL IMPACT STUDIES	CO1	understand impacts of the project on individual, society and environment
		CO2	analyse the various indicators to assess the state of health, economy and standard of life either prospering or deteriorating
		CO3	apply the methodologies of EIA for projects under suitable conditions
		CO4	assess the impacts on environment-case studies
17CE2506/A	GREEN BUILDINGS AND SUSTAINABILITY	CO1	understand green building and green building materials.
		CO2	Apply different rating agencies and features of green buildings.
		CO3	Understand sources of carbon emissions and its impact on climate.
		CO4	Apply Zonal regulation while preparing land use plans.
17CE2506/B	ADVANCED CONSTRUCTION MATERIALS	CO1	understand different types of modern materials , Paints, Enamels and Varnishes that are used in construction.
		CO2	understand the importance of special concretes and glass materials used in Building Construction.
		CO3	understand the classification and usage of materials like plastics, tar and sound absorbent materials
		CO4	understand building material like gypsum and various adhesives.

17TP1507	PERSONALITY DEVELOPMENT AND CAMPUS RECRUITMENT	CO1	understand the corporate etiquette.
		CO2	make presentations effectively with appropriate body language
		CO3	be composed with positive attitude
		CO4	understand the core competencies to succeed in professional and personal life
17CE3508	GEOTECHNICAL ENGINEERING	CO1	to understand the origins of soil and basic inter-relationships of soil components
		CO2	to determine the index properties of soil and classify the soil based on the index properties
		CO3	to understand the Soil-Water Interaction
		CO4	to understand compressibility and shear characteristics of soil
		CO5	to determine the basic engineering properties of soil
17CE3509	DESIGN OF CONCRETE STRUCTURES	CO1	design of R.C. beams
		CO2	design of R.C slabs
		CO3	design of R.C columns
		CO4	design Footings
17CE3551	ENVIRONMENTAL ENGINEERING LAB	CO1	test the various parameters and understand their significance and application.
		CO2	recommend the suitability of water for various applications by knowing water quality standards.
17CE3601	DESIGN OF STEEL STRUCTURES	CO1	design of steel connections
		CO2	design of steel members in tension and compression with simple connections
		CO3	design of laterally supported and unsupported steel beams
		CO4	design of steel column bases
17CE3602	TRANSPORTATION ENGINEERING	CO1	analyze the best alternative route for highways.
		CO2	identify suitable Pavement materials in Highway Construction by performing various tests.
		CO3	design geometrics, traffic control devices and pavement crust
		CO4	understand the Construction and Maintenance of Highways

17CE4603/A	ADVANCED STRUCTURAL ANALYSIS	CO1	analyze arches and cables.
		CO2	evaluate statically indeterminate beams, rigid jointed plane frames using Flexibility method
		CO3	evaluate statically indeterminate beams, rigid jointed & pin jointed plane frames using Stiffness method
		CO4	apply plastic analysis principles to determinate , indeterminate beams and portal frames
17CE4603/B	ADVANCED ENVIRONMENTAL ENGINEERING	CO1	Interpret contamination of water bodies on disposal of waste water.
		CO2	Understand the new concepts in Biological Waste Treatment
		CO3	Design low cost treatment units and to choose suitable treatment for selected industrial effluents.
		CO4	Identify the types of air pollutants, their effects and understand the working of controlling devices to control particulate matter.
		CO5	Understand the basics of noise, sources, effects and controlling measures.
17CE4603/C	AIRPORT PLANNING AND DESIGN	CO1	understand airport and aircraft characteristics.
		CO2	understand various obstructions at airport.
		CO3	evaluate airport runway pavement.
		CO4	understand traffic control aids
17CE4603/D	IRRIGATION STRUCTURES	CO1	understand the basics of diversion head works and canal regulation
		CO2	apply the design principles of various cross drainage works
		CO3	evaluate various types of dams and principles of Aurther cotton technology
		CO4	understand various types of spill ways.
17CE4603/E	REMOTE SENSING AND GIS	CO1	Apply the recent advances satellite based remote sensing and GIS technology in various fields of Civil engineering
		CO2	Evaluate the opportunities and available methods for integrating remote sensing and GIS in various civil engineering applications

		CO3	Understand large scale maps using satellite imageries.
17HS1604	ENGINEERING ECONOMICS AND FINANCE	CO1	understand supply demand relations in engineering economics
		CO2	understand the value for money in construction
		CO3	analyze project costing.
		CO 4	evaluate the projects based on relevant criterion
17CE2605/A	TRAFFIC SAFETY	CO1	understand the road accidents and road safety improvement strategies
		CO2	analyse the crash data using statistical methods & conduct road safety audits
		CO3	understand the mechanism needed for crash reconstruction based on case studies
		CO4	apply accident mitigation measures in view of safety of user on a highway.
17CE2605/B	BUILDING SERVICES ENGINEERING	CO1	understand the types, basic planning and specifications of buildings.
		CO2	understand ventilation and thermal insulation in structures
		CO3	understand the plumbing and electrical fixtures in structures
		CO4	understand the considerations for fire prevention and fighting and termite prevention in buildings.
17TP1606	QUANTITATIVE APTITUDE	CO1	solve various Basic Mathematics problems by following different methods
		CO2	follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems
		CO3	confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
		CO4	analyze, summarize and present information in quantitative forms including table, graphs and formulas
17MC1607	BIOLOGY FOR ENGINEERS	CO1	understand the basics about cell and its evolution
		CO2	understand the basic organization of organisms and subsequent advantages in human living
		CO3	understand the Mechanism of the cell functions that helps to solve problems in civil constructions.

		CO4	analyse biological problems with engineering expertise to provide solution
17CE3608	FOUNDATION ENGINEERING	CO1	understand the principle of earth pressure, analyze and design of earth retaining structures
		CO2	understand, analyze and design of soil slopes.
		CO3	analyze the various parameters in soil investigation program and analyze the soil profile and its properties.
		CO4	analyze various types of loads applied to the soil and its distribution in soil.
		CO5	analyze and design of various types of shallow foundation including settlements.
		CO6	analyze and design of various types of deep foundations.
17CE3651	COMPUTER APPLICATIONS IN CIVIL ENGG LAB-1	CO1	design and prepare structural drawings themselves for various structural elements by using AUTOCAD
		CO2	write and execute the program using Microsoft Excel/Mat Lab
17CE3652	ADVANCED SURVEYING LAB	CO1	calculate linear and angular measurements using Total station
		CO2	calculate area of a given building/field using Total station
		CO3	set out curves
		CO4	transfer points from plan to field
17CE5653	ENGINEERING PROJECTS IN COMMUNITY SERVICE	CO1	analyzing the societal problem and survey the literature for a feasible solution.
		CO2	applying modern Research Tools and Material available.
		CO3	evaluating knowledge of contemporary issues.
17CE3701	CONSTRUCTION ENGINEERING AND MANAGEMENT	CO1	Understand knowledge on planning and scheduling of various construction projects.
		CO2	Apply PERT and CPM networking methods.
		CO3	Apply resource optimization techniques in construction

		CO4	Apply knowledge on the concepts of quality control and safety management
17CE4702/A	ADVANCED DESIGN OF CONCRETE STRUCTURES	CO1	Evaluate sectional details for staircase and flat slab.
		CO2	Evaluate safe section for foundation and retaining wall.
		CO3	Evaluate safe section for water tanks.
		CO4	Evaluate safe composite structures.
17CE4702/B	SOIL DYNAMICS AND MACHINE FOUNDATIONS	CO1	Apply theory of vibrations to solve dynamic soil problems
		CO2	Evaluate the dynamic properties of soils using laboratory and field tests
		CO3	Analyze and design behavior of a machine foundation resting on the surface, embedded foundation.
		CO4	Analysis and design of vibration isolation systems
17CE4702/C	SOLID WASTE MANAGEMENT	CO1	Analyze the sources and composition of Municipal Solid Waste.
		CO2	Analyze collection, transport and disposal of Municipal Solid Waste.
		CO3	Apply methods of separation and recycling of Municipal Solid Waste.
		CO4	Understand handling of Bio-medical, plastic and e-waste.
17CE4702/D	RAILWAY ENGINEERING, DOCKS AND HARBOR ENGINEERING	CO1	Understand the components of the Railway Track.
		CO2	Analyze and prepare a section for Railway Track.
		CO3	Apply Signaling System for a Railway Track.
		CO4	Understand components of docks and harbors.

17CE4702/E	TOWN PLANNING AND ARCHITECTURE	CO1	Apply knowledge of architectural history and theory.
		CO2	Understand basics of Landscape Design and Housing scenarios.
		CO3	Apply the Concepts and theories of urban design and basic principles of town planning
		CO4	Apply significant techniques used in drafting development plans and planning for different urban infrastructure systems.
17CE4703/A	ADVANCED DESIGN OF STEEL STRUCTURES	CO1	Analyze the loads on the roof trusses
		CO2	Evaluate safe section for Plate girders
		CO3	Evaluate safe section gantry girders
		CO4	Evaluate eccentric connections
17CE4703/B	INDUSTRIAL EFFLUENT TREATMENT	CO1	Understand the properties of industrial wastes
		CO2	Apply suitable treatment process for industrial waste
		CO3	Understand new concepts of waste water treatment
		CO4	Analyze the characteristics and treatment of different industrial wastes
17CE4703/C	INSTRUMENTATION AND SENSOR TECHNOLOGY IN CIVIL ENGINEERING	CO1	Understand measurement units, types of measurement and errors in measurement
		CO2	Evaluate electrical variables, converse various measurements
		CO3	Understand various types of sensors and understand sensors used for temperature measurement

		CO4	Apply various sensors used in flow, pressure, level measurement
17CE4703/D	PAVEMENT DESIGN AND CONSTRUCTION	CO1	Understand the concept of layer system and factors affecting pavement design
		CO2	Evaluate the thickness of flexible pavement and rigid pavement
		CO3	Understand and fully conversant on construction of different types of pavements
		CO4	Evaluate and compute pavement overlays
17CE4703/E	FORENSICS IN CIVIL ENGINEERING	CO1	Apply forensic engineering to demonstrate structural and geotechnical failures
		CO2	Understand reinforced concrete Structures and steel structure failures through case studies
		CO3	Evaluate different geotechnical failures through case studies
		CO4	Analyze reasons for geo-environmental and fluid and hydraulic failures
17CE4704/A	DESIGN OF PRESTRESSED CONCRETE	CO1	Understand the concept of prestressing and systems of prestressing
		CO2	Evaluate losses of pre-stressing
		CO3	Analyze the section for safety of a pre-stressed beam.
		CO4	Analyze end anchorages for prestressing beams.
17CE4704/B	CONSTRUCTION EQUIPMENT AND AUTOMATION	CO1	Apply the working procedures of Equipments for earthwork & other construction Activities
		CO2	Understand working procedures of material handling and production equipments.

		CO3	Apply the concept & procedure of automation systems and Identify Fire safety Equipment
		CO4	Analyze the various processes of HVAC & Security
17CE4704/C	OPEN CHANNEL FLOW AND RIVER ENGINEERING	CO1	Apply energy principles and analyze Uniform flow.
		CO2	Evaluate Gradually varied flow and Rapidly varied flow profiles
		CO3	Understand the behavior of flow through non-prismatic channels
		CO4	Understand the concept of analysis of river flow hydraulics.
17CE4704/D	ENVIRONMENTAL GEOTECHNOLOGY	CO1	Understand concepts and principles of environmental geotechnology
		CO2	Apply the concepts involving various components of waste containment facility
		CO3	Evaluate and remediate contaminated sites
		CO4	Understand geotechnical re-use of waste
17CE4704/E	TRAFFIC ENGINEERING	CO1	Analyze the traffic flow and conduct necessary studies.
		CO2	Evaluate traffic stream characteristics.
		CO3	Analyze highway capacity.
		CO4	Analyze traffic signal systems
17CE4705/A	FINITE ELEMENT ANALYSIS	CO1	Apply elasticity principles to finite element analysis
		CO2	Apply finite element formulation techniques
		CO3	Apply stiffness matrix formulation using different element configurations
		CO4	Analyze trusses and beams using finite element analysis

17CE4705/B	REPAIR AND REHABILITATION OF STRUCTURES	CO1	Understand the causes for deterioration of structures
		CO2	Analyze damage to structures
		CO3	Apply the methods of reinforcement protection and repair materials
		CO4	Apply the techniques for repair and methods of strengthening
17CE4705/C	DISASTER PREPAREDNESS AND PLANNING MANAGEMENT	CO1	Understand the vulnerability and risk for a given society
		CO2	Evaluate the damage & life loss during disasters
		CO3	Analyze the requirement of rehabilitation or retrofitting post disaster
		CO4	Evaluate disaster mitigation programme.
17CE4705/D	HIGHWAY SAFETY	CO1	Understand the road accidents and road safety improvement strategies
		CO2	Analyze the crash data using statistical methods & conduct road safety audits
		CO3	Understand the mechanism needed for crash reconstruction based on case studies
		CO4	Apply accident mitigation measures in view of safety of user on a highway
17CE4705/E	ENVIRONMENTAL IMPACT ASSESSMENT	CO1	Understand the Concept of EIA, EIA methodologies.
		CO2	Analyze the effect on different sources on developmental activities
		CO3	Analyze the effect of development on flora and fauna
		CO4	Understand the different acts and case studies.
17CE3706	ESTIMATION, COSTING AND EVALUATION	CO1	Understand the Drawings, Procedures and different Estimating methods of Buildings
		CO2	Apply suitable procedures to estimate R.C.C works, Road and Canal

			works.
		CO3	Evaluate the rates for different civil engineering works and apply Specifications
		CO4	Evaluate valuation of buildings based on rent and understand PWD procedures
17CE4751	COMPUTER APPLICATIONS IN CIVIL ENGINEERING LAB-II	CO1	Evaluate cross sectional and reinforcement requirements of various structural elements by using STAAD.Pro
		CO2	Evaluate quantities and prepare rate analysis for various works in construction of a building using SpreadSheets.
17CE4801/A	EARTHQUAKE RESISTANT DESIGN	CO1	understand about an Engineering seismology
		CO2	understand building categories, seismic behavior and dynamics of structures earthquake causes, ground motion behavior, Seismic resistant building architecture
		CO3	analyze equivalent lateral seismic loads and carry out a seismic design as per IS code provisions and ductility design for RC elements
		CO4	evaluate the earthquake resistant of design and analyze the concept of base isolation and design principles
17CE4801/B	GROUND IMPROVEMENT TECHNIQUES	CO1	Understand need and methods of ground improvement
		CO2	techniques Apply suitable ground improvement technique for a given site
		CO3	Apply different grouting techniques, geotextiles and their functions
		CO4	Evaluate the expansivity of soils and recommended types of foundations for expansive soils and suggest soil stabilization techniques based on field conditions

17 CE 4801/C	GROUND WATER HYDROLOGY	CO1	Understand components, fluctuations and budgeting of ground water.
		CO2	Evaluate and Design of wells ad assessment of ground water quality.
		CO3	Evaluate sea water intrusion.
		CO4	Understand the artificial ground water recharge.
17CE4801/D	AIR POLLUTION AND CONTROL	CO1	Understand various types of air pollutants and their effects
		CO2	Understand the dispersion phenomenon of air pollutants with regard to meteorological parameters
		CO3	Evaluate the sampling of pollutants from chimney stacks and ambient atmosphere
		CO4	Analyze various types of air pollution controlling equipment
17CE4801/E	URBAN TRANSPORT AND PLANNING	CO1	Analyze various stages in transport Planning Process
		CO2	Apply various methods for data collection
		CO3	Apply and finalize the route choice and network design
		CO4	Apply various methods for economic evaluation of transport projects
17CE2802/A	WATER QUALITYENGI NEERING	CO1	Analyze characteristics of water
		CO2	Applythestandardsowaterqualityandtreatmentprocess
		CO3	Analyze pollution statusof in water bodies
		CO4	Understand the quality behavior of due to discharge of waste load by modeling and monitoring