DEPARTMENT OF CIVIL ENGINEERING

Course outcomes with program outcomes

SEMESTER - 1 & 2

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	solve systems of linear equations, diagonalize matrices and characterise quadratic forms	3	3	3	3	2	1			1	2		2
		CO 2	compute the partial and total derivatives and maxima and minima of multivariable functions	3	3	3	3	2	1			1	2		2
MAT 101	LINEAR ALGEBRA AND CALCULUS	CO 3	compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas	3	3	3	3	2	1			1	2		2
	CALCOLOS	CO 4	perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent	3	2	3	2	1	1			1	2		2
		CO 5	determine the Taylor and Fourier series expansion of functions and learn their applications.	3	3	3	3	2	1			1	2		2
		CO 1	Compute the quantitative aspects of waves and oscillations in engineering systems.	3	2						1	2			1
		CO 2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.	3	2						1	2			1
PHT 1000	ENGINEERING PHYSICS A (FOR CIRCUIT	CO 3	Analyze the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.	3	2						1	2			1
	BRANCHES)	CO 4	Classify the properties of magnetic materials and apply vector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems	3	2						1	2			1
		CO 5	Analyze the principles behind various superconducting applications, explain the working of solid state lighting devices and fibre optic communication system	3	1						1	2			1
		CO 1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.	1	2	1									
		CO 2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.	1	1		1	2							
CYT 100	NGINEERING CHEMISTRY	CO 3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.	1	1		1	2							
		CO 4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.	2	1										
		CO 5	Study various types of water treatment methods to develop skills for treating wastewater.	1			1			3					
		CO 1	Recall principles and theorems related to rigid body mechanics	2	2										
		CO 2	Identify and describe the components of system of forces acting on the rigid body	3	3										
EST 100	ENGINEERING MECHANICS	CO 3	Apply the conditions of equilibrium to various practical problems involving different force system	3	3										

1		CO 4	Choose appropriate theorems, principles or formulae to solve problems of mechanics	3	3								
		CO 5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses	3	3								
		CO 1	Draw the projection of points and lines located in different quadrants	3									
		CO 2	Prepare multiview orthographic projections of objects by visualizing them in different positions	3									
EGT 110	ENGINEERING	CO 3	Draw sectional views and develop surfaces of a given object	3	1								
EST 110	GRAPHICS	CO 4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.	3								1	
		CO 5	Convert 3D views to orthographic views	3								2	
		CO 6	Obtain multiview projections and solid models of objects using CAD tools	3			3					3	
		CO 1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.	3				3	2	2			
		CO 2	Explain different types of buildings, building components, building materials and building construction	3	2					3			
		CO 3	Describe the importance, objectives and principles of surveying.	3	2			2	3		2		
		CO 4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps	3	2	1	3				2		
EST 120	BASICS OF CIVIL & MECHANICAL	CO 5	Discuss the Materials, energy systems, water management and environment for green buildings.	3	2		3				2		
EST 120	ENGINEERING	CO 6	Analyse thermodynamic cycles and calculate its efficiency	3	2		3						
		CO 7	Illustrate the working and features of IC Engines	3	1		3						
		CO 8	Explain the basic principles of Refrigeration and Air Conditioning	3	1								
		CO 9	Describe the working of hydraulic machines	3	2								
		CO 10	Explain the working of power transmission elements	3	1								
		CO 11	Describe the basic manufacturing, metal joining and machining processes	3									
		CO 1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits	3	1								2
		CO 2	Develop and solve models of magnetic circuits	3	1								2
EST	BASICS OF ELECTRICAL AND	CO 3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state	3	1								2
130	ELECTRONICS ENGINEERING	CO 4	Describe working of a voltage amplifier	2									
		CO 5	Outline the principle of an electronic instrumentation system	2									2
		CO 6	Explain the principle of radio and cellular communication	2									2

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HUN 101LIFE SKILLSCO 2 and stress.and stress.and stress.and stress.CO 3Explain the basic mechanics of effective communication and demonstrate these through presentations.and stress.1CO 4Take part in group discussionsand stress.and stress.CO 5Use appropriate thinking and problem solving techniques to solve new problems321CO 6Understand the basics of teamwork and leadershipand stress.and stress.and stress.CO 6Understand the basics of teamwork and leadershipand stress.and stress.and stress.CO 7Co 8Compute the derivatives and line integrals of vector functions and learn their applicationsand stress.and stress.MAT 102VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TO A NERDON MORECO 2Evaluate surface and volume integrals and learn their inter-relations and applicationsand stress.and stress.MAT 102VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TO A NERDON MORECO 3Solve homogeneous and non-homogeneous linear differential equation with constantand stress.and stress.MAT 102CO 3Solve homogeneous and non-homogeneous linear differential equation with constantand stress.and stress.and stress.MAT 102CO 3Solve homogeneous and non-homogeneous linear differential equation with constantand stress.and stress.and stress.MAT 102CO 3Solve homogeneous and non-homogeneous linear differential equation with constantand stress.and stress.<			1	3		
101 CO 3 Explain the basic mechanics of effective communication and demonstrate these through presentations. 1 1 CO 4 Take part in group discussions 1 1 1 1 CO 5 Use appropriate thinking and problem solving techniques to solve new problems 3 2 1 CO 6 Understand the basics of teamwork and leadership 1 1 1 CO 6 Understand the derivatives and line integrals of vector functions and learn their applications 3 3 3 2 1 MAT 102 VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TO NOT CO 3 CO 2 Evaluate surface and volume integrals and learn their inter-relations and applications 3 3 3 3 2 1			1 3 1	3		1
CO 5Use appropriate thinking and problem solving techniques to solve new problems321CO 6Understand the basics of teamwork and leadership111CO 6Understand the basics of teamwork and leadership11CO 1Compute the derivatives and line integrals of vector functions and learn their applications33321VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TO ANIONS AND TO ANION CO 3CO 2Evaluate surface and volume integrals and learn their inter-relations and applications33321			3			1
CO 6 Understand the basics of teamwork and leadership I I CO 6 Understand the basics of teamwork and leadership I I I VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TO A NORDER CO 2 Evaluate surface and volume integrals and learn their inter-relations and applications 3 3 3 3 2 1			3			
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MAT 102 VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORME CO 2 Evaluate surface and volume integrals and learn their inter-relations and applications 3 3 3 3 2 1			1			
MAT 102 DIFFERENTIAL EQUATIONS AND CO 3 Solve homogeneous and non-homogeneous linear differential equation with constant 3 3 3 3 2 1				2		2
MAT 102 EQUATIONS AND CO 3 Coefficients Coefficients 3 3 3 2 1	<u> </u>		1	2		2
TRANSFORMS CO.4. Compute Laplace transform and apply them to solve ODEs arising in angineering 2, 2, 2, 2, 2, 2, 1			1	2		2
CO 4 Compute Laplace transform and apply them to solve ODEs arising in engineering 3 3 3 3 3 2 1			1	2		2
CO 5Determine the Fourier transforms of functions and apply them to solve problems arising in engineering33321			1	2		2
CO 1 Develop vocabulary and language skills relevant to engineering as a profession				3		2
CO 2 Analyze, interpret and effectively summarize a variety of textual content				1		3
HUN PROFESSIONAL CO 3 Create effective technical presentations 1 102 CONMUNICATION Discuss a given technical/non-technical topic in a group setting and arrive at 1			1	3		
102 COMMUNICATION CO 4 Discuss a given technical topic in a group setting and arrive at generalizations/consensus				3		1
CO 5 Identify drawbacks in listening patterns and apply listening techniques for specific needs 1			2	3		
CO 6 Create professional and technical documents that are clear and adhering to all the necessary conventions 1 1			1	3		
CO 1 Analyze a computational problem and develop an algorithm/flowchart to find its solution * * *				*	*	*
CO 2 Develop readable* C programs with branching and looping statements, which uses * <				*		*
EST 102 PROGRAMING IN C CO 3 Write readable C programs with arrays, structure or union for storing the data to be processed * * * * *				*		*
Divide a given computational problem into a number of modules and develop a readableCO 4multi-function C program by using recursion if required, to find the solution to the*** <td< td=""><td></td><td></td><td></td><td>*</td><td>*</td><td>*</td></td<>				*	*	*
CO 5 Write readable C programs which use pointers for array processing and parameter passing * * *				*		*
CO 6 Develop readable C programs with files for reading input and storing output * * *				*		*
CO 1 Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories 3 3		1	2			1
CO 2 Understand the need for precise measurement practices for data recording 3 3		1	2			1

PHL 120	ENGINEERING PHYSICS LAB	CO 3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations	3		3		1	2			1
120	THISCS LAD	CO 4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics	3		3		1	2			1
		CO 5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results	3		3		1	2			1
		CO 1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses	3		2						3
		CO 2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs	3		3						3
CYL	ENGINEERING	CO 3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds	3		3						3
120	CHEMISTRY LAB	CO 4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis	3		3						3
		CO 5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments	3		1						3
		CO 6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum	3		1						3
		CO 1	Name different devices and tools used for civil engineering measurements	1		1	1		2	2		
		CO 2	Explain the use of various tools and devices for various field measurements	1		1	1		2	2		
		CO 3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work	1		1	1	2	2	2	1	
ESL 120	CIVIL & MECHANICAL WORKSHOP	CO 4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.	1		1	1	2	2	2	1	1
	WORKSHOL	CO 5	Compare different techniques and devices used in civil engineering measurements	1		1	1		2	2		1
		CO 6	Identify Basic Mechanical workshop operations in accordance with the material and objects	1								
		CO 7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades	2								
		CO 8	Apply appropriate safety measures with respect to the mechanical workshop trades	2								
		CO 1	Demonstrate safety measures against electric shocks				3					1
		CO 2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols	2						1		
ESL 130	ELECTRICAL & ELECTRONICS	CO 3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings	2	1		1	1	2	2		2
ESL 150	WORKSHOP	CO 4	Identify and test various electronic components	3								2
		CO 5	Draw circuit schematics with EDA tools	3		2						2

CO 6	Assemble and test electronic circuits on boards	3		2				1
CO 7	Work in a team with good interpersonal skills					3	2	2

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	Understand the concept and the solution of partial differential equation.	3	3	3	3	2	1				2		2
	PARTIAL DIFFERENTIAL	CO 2	Analyse and solve one dimensional wave equation and heat equation.	3	3	3	3	2	1				2		2
MAT 201	EQUATIONS AND COMPLEX	CO 3	Understand complex functions, its continuity differentiability with the use of Cauchy- Riemann equations.	3	3	3	3	2	1				2		2
	ANALYSIS	CO 4	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula, understand the series expansion of analytic function	3	3	3	3	2	1				2		2
		CO 5	Understand the series expansion of complex function about a singularity and Apply residue theorem to compute several kinds of real integrals.	3	3	3	3	2	1				2		2
		CO 1	Recall the fundamental terms and theorems associated with mechanics of linear elastic deformable bodies.	2											
		CO 2	Explain the behavior and response of various structural elements under various loading conditions.	3	1										
CET201	MECHANICS OF	CO 3	Apply the principles of solid mechanics to calculate internal stresses/strains, stress resultants and strain energies in structural elements subjected to axial/transverse loadsand bending/twisting moments.	3	2										
	SOLIDS	CO 4	Choose appropriate principles or formula to find the elastic constants of materials making use of the information available.	3	2										
		CO 5	Perform stress transformations, identify principal planes/ stresses and maximum shear stress at a point in a structural member.	3	2										
		CO 6	Analyse the given structural member to calculate the safe load or proportion the cross section to carry the load safely.	3	3	1									
		CO 1	Recall the relevant principles of hydrostatics and hydraulics of pipes and open channels	2	2										
		CO 2	Identify or describe the type, characteristics or properties of fluid flow	2	2										
CET 203	Fluid Mechanics and	CO 3	Estimate the fluid pressure, perform the stability check of bodies under hydrostatic condition	3	3				1						
	Hydraulics	CO 4	Compute discharge through pipes or estimate the forces on pipe bends by applying hydraulic principles of continuity, energy and/or momentum	3	3				1						
		CO 5	Analyze or compute the flow through open channels, perform the design of prismatic channels	3	3	2									
		CO 1	Apply surveying techniques and principles of leveling for the preparation of contour maps, computation of area-volume and sketching mass diagram	3	3		2	2							
	SURVEYING	CO 2	Apply the principles of surveying for triangulation	3	3		2								

CET205	&	CO 3	Apply different methods of traverse surveying and traverse balancing	3	3						1	2			
	GEOMATICS	CO 4	Identify the possible errors in surveying and apply the corrections in field measurements	3	2										
		CO 5	Apply the basic knowledge of setting out of different types of curves	3	2	1	1				1	2			
		CO 6	Employ surveying techniques using advanced surveying equipments	3			2	2			1				2
		CO 1	Explain the different concepts and principles involved in design engineering.	2	1					1			1		
EST 200	DESIGN AND	CO 2	Apply design thinking while learning and practicing engineering.		2				1		1				2
	ENGINEERING	CO 3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.			2			1	1		2	2		1
		CO 1	Understand the core values that shape the ethical behaviour of a professional.								2			2	
		CO 2	Adopt a good character and follow an ethical life.								2			2	
HUT 200	Professional Ethics	CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.								3			2	
		CO 4	Solve moral and ethical problems through exploration and assessment by established experiments.								3			2	
		CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.								3			2	
		CO 1	Understand the relevance and the concept of sustainability and the global initiatives in this direction						2	3					2
	SUSTAINABLE	CO 2	Explain the different types of environmental pollution problems and their sustainable solutions						2	3					2
MCN201	ENGINEERING	CO 3	Discuss the environmental regulations and standards						2	3					2
		CO 4	Outline the concepts related to conventional and non-conventional energy						2	3					2
		CO 5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles						2	3					2
	CIVIL	CO 1	Illustrate ability to organise civil engineering drawings systematically and professionally	3							2	3	3		
CEL	ENGINEERING PLANNING	CO 2	Prepare building drawings as per the specified guidelines.	3							2	3	3		
201	&DRAFTING	CO 3	Assess a complete building drawing to include all necessary information	3							2	3	3		
	LAB	CO 4	Create a digital formof the building plan using any drafting software	3							2	2	3		
		CO 1	Use conventional surveying tools such as chain/tape and compass for plotting and area determination.	3							1	2			
		CO 2	Apply levelling principles in field	3			1				1	2			
CEL 203	SURVEY LAB	CO 3	Solve triangulation problems using theodolite	3			1				1	2			

	CO 4	Employ total station for field surveying	3		1	3		1	2		2
	CO 5	Demonstrate the use of distomat and handheld GPS	3			3		1			2

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
cout		CO 1	Understand the concept, properties and important models of discrete random variables and, using them, analyse suitable random phenomena.	3	2	2	2	2					2		1
		CO 2	Understand the concept, properties and important models of continuous random variables and, using them, analyse suitable random phenomena.	3	2	2	2	2					2		1
MAT 202	PROBABILITY,STATISTI CS AND NUMERICAL METHODS	CO 3	Perform statistical inferences concerning characteristics of a population based on attributes of samples drawn from the population	3	2	2	2	2					2		1
	NUMERICAL METHODS	CO 4	Compute roots of equations, evaluate definite integrals and perform interpolation on given numerical data using standard numerical techniques	3	2	2	2	2					2		1
		CO 5	Apply standard numerical techniques for solving systems of equations, fitting curves on given numerical data and solving ordinary differential equations.	3	2	2	2	2					2		1
		CO 1	Recall the fundamental concepts of surface processes, subsurface process, minerals, rocks, groundwater and geological factors in civil engineering constructions.	2					1	2					
		CO 2	Identify and describe the surface processes, subsurface process, earth materials, groundwater and geological factors in civil engineering constructions.	3											
CET202	Engineering Geology	CO 3	Apply the basic concepts of surface and subsurface processes, minerals, rocks, groundwater and geological characteristics in civil engineering constructions.	3											
		CO 4	Analyze and classify geological processes, earth materials and groundwater.	3	2										
		CO 5	Evaluation of geological factors in civil engineering constructions.	3	1	3			3	3	2				2
		CO 1	Explain the fundamental concepts of basic and engineering properties of soil	3											
		CO 2	Describe the laboratory testing methods for determining soil parameters	3											
CET 204	GEOTECHNICAL ENGINEERING - I	CO 3	Solve the basic properties of soil by applying functional relationships	2	3										
		CO 4	Calculate the engineering properties of soil by applying the laboratory test results and the fundamental concepts of soil mechanics	2	3										
		CO 5	Analyze the soil properties to identify and classify the soil	2	3										
		CO 1	Apply the basic principles of Highway planning and design highway geometric elements	3	3	3	1		1	3	1		2		1
	TRANSPORTATION	CO 2	Apply standard code specifications in judging the quality of highway materials; designing of flexible pavements	3	1	3	1		1	1	1		1		1
CET206	ENGINEERING	CO 3	Explain phenomena in road traffic by collection, analysis and interpretation of traffic data through surveys; creative design of traffic control facilities	3	2	2	1					1	2		2
		CO 4	Understand about railway systems, tunnel, harbour and docks	2						2	1				2

I		CO 5	Express basics of airport engineering and design airport elements	2	2	2	Ī		2		2				
		CO 5		3	3	3			3		2				
		CO 1	Explain the different concepts and principles involved in design engineering.	2	1					1			1		
EST 200	ESIGN AND ENGINEERIN	CO 2	Apply design thinking while learning and practicing engineering.		2				1		1				2
		CO 3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.			2			1	1		2	2		1
		CO 1	Understand the core values that shape the ethical behaviour of a professional.								2			2	
		CO 2	Adopt a good character and follow an ethical life.								2			2	
HUT 200	Professional Ethics	CO 3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.								3			2	
		CO 4	Solve moral and ethical problems through exploration and assessment by established experiments.								3			2	
		CO 5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.								3			2	
		CO 1	Explain the background of the present constitution of India and features.						2	2	2		2		
		CO 2	Utilize the fundamental rights and duties.						3	3	3		3		
MCN202	CONSTITUTION OF INDIA	CO 3	Understand the working of the union executive, parliament and judiciary.						3	2	3		3		
		CO 4	Understand the working of the state executive, legislature and judiciary.						3	2	3		3		
		CO 5	Utilize the special provisions and statutory institutions.						3	2	3		3		
		CO 6	Show national and patriotic spirit as responsible citizens of the country						3	3	3		2		
		CO 1	The understand the behaviour of engineering materials under various forms and stages of loading	3	2	2	2	1	3			2	2		2
CEL	MATERIAL TESTING	CO 2	Characterize the elastic properties of various materials.	3	2	2	2	1	3			2	2		2
202	LAB - I	CO 3	Evaluate the strength and stiffness properties of engineering materials under various loading conditions.	3	2	2	2	1	3			2	2		2
		CO 1	Apply fundamental knowledge of Fluid Mechanics to corresponding experiments	2	2						2	3			
CEL	FLUID MECHANICS	CO 2	Apply theoretical concepts in Fluid Mechanics to respective experiments	2	2		2				2	3			
204	LAB	CO 3	Analyse experimental data and interpret the results	3	3						2	3	3		
		CO 4	Document the experimentation in prescribed manner	1							2	2	3		

Course code	Course Name		Course outcomes	PO1	PO2	PO3	B PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	Apply the principles of solid mechanics to analyse trusses.	2	2										
		CO 2	Apply energy principles to analyse statically determinate structures.	2	2										

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CET301	STRUCTURAL ANALYSIS - I	CO 3	Identify the problems with static indeterminacy and understand the basic concepts of tackling such	3	3										
		CO 4	Apply suitable methods of analysis for various types of structures including cables, suspension	3	2										
		CO 5	Analyse the effects of moving loads on structures using influence lines.	3	2										
		CO 6	Apply specific methods such as slope deflection and moment distribution methods of structural	3	2										
		CO 1	Recall the fundamental concepts of limit state design and code provisions for design of concrete members under bending, shear, compression and torsion.	1		1									
	DESIGN OF	CO 2	Analyse reinforced concrete sections to determine the ultimate capacity in bending, shear and compression.	3	3										
CET303	CONCRETE STRUCTURES	CO 3	Design and detailbeams, slab, stairs and footings using IS code provisions.	3		3					2				
		CO 4	Design and detail columns using IS code and SP 16 design charts.	3		3					2				
		CO 5	Explain the criteria for earthquake resistant design of structures and ductile detailing of concrete structures subjected to seismic forces.	1		1									
		CO 1	Understand soil exploration methods	3			3								
	GEOTECHNICAL	CO 2	Explain the basic concepts, theories and methods of analysis in foundation engineering	3											
CET305	ENGINEERING - II	CO 3	Calculate bearing capacity, pile capacity, foundation settlement and earth pressure	2	3										L
		CO 4	Analyze shallow and deep foundations	2	2	3									L
		CO 5	Solve the field problems related to geotechnical engineering	3	3										<u> </u>
		CO 1	Describe and estimate the different components of hydrologic cycle by processing hydro- meteorological data	3	3		1			1					
	HYDROLOGY & WATER	CO 2	Determine the crop water requirements for the design of irrigation canals by recollecting the principles of irrigation engineering	3	3					1					
CET307	RESOURCES	CO 3	Perform the estimation of streamflow and/or describe the river behavior and control structures	3	2					1					
	ENGINEERING	CO 4	Describe and apply the principles of reservoir engineering to estimate the capacity of reservoirs and their useful life	3	3					1					
		CO 5	Demonstrate the principles of groundwater engineering and apply them for computing the yield of aquifers and wells	3	3					1					
		CO 1	Describe the properties of materials used in construction	3					1	1	1		1		1
		CO 2	Explain the properties of concrete and its determination	3					1		1		1		1
GETTANO	CONSTRUCTION	CO 3	Describe the various elements of building construction	3					1				1		1
CET309	TECHNOLOGY AND MANAGEMENT	CO 4	Explain the technologies for construction	3					2	1			1		1
		CO 5	Describe the procedure for planning and executing public works	3	2				1				1	3	1
		CO 6	Apply scheduling techniques in project planning and control	3	3	3		1				2	1	3	1
		CO 1	Define and use various terminologies in use in disaster management parlance and organise each of these terms in relation to the disaster management cycle		2				2				2		2
		CO 2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment	2	3	2		2	2	3			3		2
	DISASTER	CO 3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk	2	3	2	2	2	2	3			3		2
MCN301	MANAGEMENT	CO 4	Explain the core elements and phases of Disaster Risk Management and develop possible measures to reduce disaster risks across sector and community	3	3	3		2	2	3					2

		CO 5	Identify factors that determine the nature of disaster response and discuss the various disaster response actions	3	3			2	2	3				2
		CO 6	Explain the various legislations and best practices for disaster management and risk reduction at national and international level	3					2	3	3			2
	MATERIAL	CO 1	To describe the basic properties of various construction materials	3	2	2	2	1	3			2	2	2
CEL331	TESTING	CO 2	Characterize the physical and mechanical properties of various construction materials.	3	2	2	2	1	3			2	2	2
	LAB II	CO 3	Interpret the quality of various construction materials as per IS Codal provisions.	3	2	2	2	1	3			2	2	2
		CO 1	Identify and classify soil based on standard geotechnical experimental methods.	3				1				2	2	
		CO 2	Perform and analyze permeability tests.	3				2				2	2	
	GEOTECHNICAL	CO 3	Interpret engineering behavior of soils based on test results.	3	2							2	2	
CEL333	ENGINEERING LAB	CO 4	Perform laboratory compaction, CBR and in-place density test for fill quality control in the field.	3				1				2	2	
	LAD	CO 5	Evaluate the strength of soil by performing various tests viz. direct shear test, unconfined compressive strength test and triaxial shear test.	3				2				2	2	
		CO 6	Evaluate settlement characteristics of soils.	3	1			2				2	2	

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	Understand the principles of plastic theory and its applications in structural analysis.	3	2										
		CO 2	Examine the type of structure and decide on the method of analysis.	3	3	2									
CET302	STRUCTURAL ANALYSIS - II	CO 3	Apply approximate methods of analysis for framed structures to ascertain stress resultants approximately but quickly.	3	3	1									
	AIVAL I 515 - II	CO 4	Apply the force method to analyse framed structures.	3	3	1									
		CO 5	Apply the displacement methods to analyse framed structures.	3	3	1									
		CO 6	Remember basic dynamics, understand the basic principles of structural dynamics and apply the	3	3	1									
		CO 1	Elucidate the causes of failure, principles of design of different components of hydraulic structures	3	2					1					
		CO 2	Describe the features of canal structures and perform the design of alluvial canals		2										
CET306	DESIGN OF HYDRAULIC STRUCTURES	CO 3	Perform the hydraulic design of minor irrigation structures such as cross drainage works, canal falls, cross regulator.	3	3	3									
		CO 4	Prepare the scaled drawings of different minor irrigation structures			3							3		
		CO 5	Describe the design principles and features of dams and perform the stability analysis of gravity dams	3	2				1	1					
		CO 1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare. Take appropriate decisions regarding volume of output and to evaluate the social cost	2										3	
		CO 2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production.	2	2			2	2	3				3	
HUT 300	Industrial Economics & Foreign Trade	CO 3	Determine the functional requirement of a firm under various competitive conditions.	2	2	1								3	

	i orongin i i ude	CO 4	Examine the overall performance of the economy, and the regulation of economic	2	2	1			1					3		
			fluctuations and its impact on various sections in the society. Determine the impact of changes in global economic policies on the business	-	-	1			1					5		
		CO 5	opportunities of a firm.	2	2	1								3		
		CO 1	Learn to prepare for a competitive examination	3	1	1			2							
CET308	COMPREHENSIVE	CO 2	Comprehend the questions in Civil Engineering field and answer them with confidence	3	1				2				3			
CEISOO	COURSE WORK	CO 3	Communicate effectively with faculty in scholarly environments	3	1			1	2				3			
		CO 4	Analyze the comprehensive knowledge gained in basic courses in the field of Civil Engineering	3	3			1	2							
		CO 1	Analyse the suitability of soil as a pavement subgrade material	3			2				1	2				
		CO 2	Assess the suitability of aggregates as a pavement construction material	3			2				1	2				
CEL332	TRANSPORTATION ENGINEERING LAB	CO 3	Characterize bitumen based on its properties so as to recommend it as a pavement construction material.	3			2				1	2			2	
	ENGINEERING LAB		CO 4	Design bituminous mixes for pavement layers	3			2				1	2			2
		CO 5	Assess functional adequacy of pavements based on roughness of pavement surface.	3			2				1	2			2	
CEI	CIVIL	CO 1	To undertake analysis and design of multi-storeyed framed structure, schedule a given set of project activities using a software.	3	2	2	2	1	3			2	2		2	
CEL 334	ENGINEERING	CO 2	To prepare design details of different structural components, implementation plan for a project.	3	2	2	2	1	3			2	2		2	
551	SOFTWARE LAB	CO 3	To prepare a technical document on engineering activities like surveying, structural design and project planning.	3	2	2	2	1	3			2	2		2	
		CO 1	To recall the properties and testing procedure of concrete materials as per IS code	3				2	2	3						
	ADVANCED	CO 2	To describe the procedure of determining the properties of fresh and hardened concrete	3				2	2	3						
CET352	CONCRETE	CO 3	To design concrete mix using IS Code Methods.	3	3	3	2	2	2	3						
	TECHNOLOGY	CO 4	To explain nondestructive testing of concrete	3				2	2	3						
		CO 5	To describe the various special types of concretes	3				2	2	3						
		CO 1	To appreciate the need for minimizing the environmental impacts of developmental activities						2	2						
	ENVIRONMENTAL IMPACT ASSESSMENT	CO 2	To understand environmental legislation & clearance procedure in the country						2							
CET 362		CO 3	To apply various methodologies for assessing the environmental impacts of any developmental activity	2			3	2		3						
	ASSESSIVIEIN I	CO 4	To prepare an environmental impact assessment report				2		2	2	3		3			
		CO 5	To conduct an environmental audit				2	1		2	2		2			

Course	Course Name	Course outcomes	PO1	POT	PO3 I	204 F	205 P	206 I	207 P	208	PO9 F	PO10 P	PO11	PO12
code	Course Manie		101	102	1031	041	051	001	0/1	00	1071	0101	on	1012

r			Explain the behavior and properties of structural steel members to resist various structural		1		1	-	1		1	1	1		1	
		CO 1		3												
		CO 2	forces and actions and apply the relevant codes of practice Analyses the behavior of structural steel members and undertake design at both serviceability	2	2	2										
		CO 2	and ultimate limit states	2	3	2										
CET401	DESIGN OF STEEL STRUCTURES	CO 3	Explain the theoretical and practical aspects of Design of composite Steel Structure along with the planning and design aspects	2	3	2										
		CO 4	Apply a diverse knowledge of Design of Steel engineering practices applied to real life problems	2	3	3										
		CO 5	Demonstrate experience in the implementation of design of structures on engineering concepts which are applied in field Structural Engineering	2	3	3										
		CO 1	Describe the theories of accident causation and preventive measures of industrial accidents.	2	2				2	2	2				1	
		CO 2	Explain about personal protective equipment, its selection, safety performance & indicators and importance of housekeeping.	2	1	2		1	1	1	1				1	
MCN401	INDUSTRIAL SAFETY ENGINEERING	CO 3	Explain different issues in construction industries.	2	2	2		1	1	1	1	1	1		1	
		CO 4	Describe various hazards associated with different machines and mechanical material handling.	2	2	2		1	1	1	1	1	1		1	
		CO 5	Utilise different hazard identification tools in different industries with the knowledge of different types of chemical hazards.	2	2	2	1	1	1	1	1	1	1		1	
		CO 1	Explain interaction between subsystems of earth that give rise to hazards and their potential for disasters	2	1		2	1	2	3	1		1	1	3	
	NATURAI DISASTERS	NATURAL DISASTERS	CO 2	Explain the evolving concepts and thoughts of management of hazards and disasters	2	1		2	1	2	3	1		1	1	3
CET445	AND MITIGATION	CO 3	Analyse the causes behind natural disasters and evaluate their magnitude and impacts	1	2	2	3	3	3	2	2	2	2	1	3	
	AND MITIGATION	CO 4	Create management plans for hazards and disasters, and understand the roles of agencies involved.	2	1	3	2	3	2	3	2	2	1	3	3	
		CO 5	Explain the concept of sustainable development and EIA and their role in mitigating disasters	2	2	3	2	1	3	3	2	1	2	2	3	
		CO 1	Identify academic documents from the literature which are related to her/his areas of interest	2	2	1	1		2	1					3	
		CO 2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest	3	3	2	3		2	1					3	
CEQ413	SEMINAR	CO 3	Prepare a presentation about an academic document	3	2			3			1		2		3	
		CO 4	Give a presentation about an academic document	3				2			1		3		3	
		CO 5	Prepare a technical report	3	3	3	3	2	2		2		3		3	
		CO 1	Model and solve real world problems by applying knowledge across domains	2	2	2	1	2	2	2	1	1	1	1	2	
		CO 2	Develop products, processes or technologies for sustainable and socially relevant applications	2	2	2		1	3	3	1	1		1	1	
CED415	5 PROJECT PHASE I	CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks									3	2	2	1	
		CO 4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms					2			3	2	2	3	2	
		CO 5	Identify technology/research gaps and propose innovative/creative solutions	2	3	3	1	2			1				1	
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms					2			2	2	3	1	1	
	ENVIRONMENTAL ENGG	CO 1	Analyse various physico-chemical and biological parameters of water	3	3	3	1		3	3					3	

	LAB	CO 2	Compare the quality of water with drinking water standards and recommend its suitability for drinking purposes	3	3	3	1	3	3			3
		CO 1	Identify suitable materials for different types of pavements	3								
		CO 2	Interpret material test results with respect to field conditions and standards	3		2		2				
CET433	HIGHWAY MATERIALS AND DESIGN	CO 3	Apply the pavement material properties to analysis of pavements	3	2		2					2
		CO 4	Evaluate material properties and design pavement mixes.	3	3	3	2	2				2
		CO 5	Analyse and design the pavement, flexible or rigid, for the conditions prevailing at site	3	3	3	3	3				2

Course code	Course Name		Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
		CO 1	Model and solve real world problems by applying knowledge across domains	2	2	2	1	2	2	2	1	1	1	1	2
		CO 2	Develop products, processes or technologies for sustainable and socially relevant applications	2	2	2		1	3	3	1	1		1	1
CED416	PROJECT PHASE II	CO 3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks									3	2	2	1
CLD410	TROJECT THASE II	CO 4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms					2			3	2	2	3	2
		CO 5	Identify technology/research gaps and propose innovative/creative solutions	2	3	3	1	2							1
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms					2			2	2	3	1	1
		CO 1	Explain the role of railways in national development and carry out geometric designs of railway track by identifying component parts of railway track	2	2	3	1		1		1	2	2		1
		CO 2	Design railway operation and control systems	2	3	3	2	1	3	3	3	2	2	2	1
CET434	RAILWAY AND TUNNEL ENGINEERING	CO 3	Analyze factors affecting railway accidents and understand the modern developments in railways and develop an awareness about the maintenance of railway system.	2	3	2	1		1	1	2		2	2	1
		CO 4	explain about the importance, types and methods of construction of tunnels.	2	2	1	2		2	2	2	2		2	
		CO 5	Develop and analyze design aspects of ventillation, linning, and lighting in tunnels.	2	2		2	1	2	1	2			2	1
		CO 1	Explain the various construction procedures for sub structures and super structures	3					1	1	1		1		1
	CONSTRUCTION	CO 2	Describe the various construction activities involved in underground and under water constructi	3					1	1	1		1		1
CET454	METHODS AND	CO 3	Dmonstrate basic knowledge about construction equipment and machineries	3					1		1		1		1
	EQUIPMENT	CO 4	Explain the equipment used for production of aggregate and concreting	3					1				1		1
		CO 5	Select construction equipment appropriate to task	3	2				1				1	2	1
		CO 1	Identify the need for transportation planning, the issues and challenges related to transportation and its interaction with urban structure and land use		1	2	1		3	3	3				2

				1	1	r		1	1		1	r	r		
		CO 2	Apply the concept of travel demand and analyse its role in transportation planning and to apply		1	2	2		2		1				2
	TRANSPORTATION		the concept in systems approach to transportation planning process Appry the concept of defineation of study area, sampling of data, and data conection												
CET436	PLANNING	CO 3	techniques for the four stage planning process and to analyse the techniques for predicting trip	2	2	2	3	2	2		1				2
		CO 4	Apply and analyse the methods for predicting trip distribution, mode split and traffic assignment	3	3	3	3	3	2		1				2
			Apply the land use transport models and to analyse the sustainable approaches to transportation												
		CO 5	planning and preparation of comprehensive mobility plan with application of GIS	2	1	3	3	3	3	3	3		2	2	3
		CO 1	Explain the fundamental concepts of sustainability	2					2	3					2
CET458	SUSTAINABLE	CO 2	Describe the properties and uses of sustainable building materials	2					2	3					2
CE1438	CONSTRUCTION	CO 3	Identify suitable construction techniques and practices for sustainable buildings	2					2	3					2
		CO 4	Discuss the standards and guidelines for sustainable buildings	2					2	3					2
		CO 5	Comment on the role of BIM and automation in sustainable construction	2					2	3					2
		CO 1	Explain the fundamental concepts of climate and its influencing factors	2											
	8 CLIMATE CHANGE AND SUSTAINABILITY	CO 2	Explain the factors affecting climate change and the harmful impacts due to climate change		2		2			2					
CET468		CO 3	Discuss the problems due to urbanization and the need for sustainable development		3		3			2					
		CO 4	Demonstrate the various adaptation and mitigation techniques for combating climate change	2						3					
		CO 5	Discuss multilateral agreements on climate change, Case studies on Climate change							2					
		CO 1	Recall the basics ideas and theories associated with Concrete technology and Masonry structures.	1											
		CO 2	Understand the need and methodology of repair and rehabilitation of structures, the various mechanisms used, and tools for diagnosis of structures	3	2		2								
CET456	REPAIR AND REHABILITATION OF BUILDINGS	CO 3	Identifying the criterions for repairing / maintenance and the types and properties of repair materials used in site. Learn various techniques for repairing dam- aged and corroded structures	3	2	3		3	2	1					
	BUILDINGS	CO 4	Proposing wholesum solutions for maintenance/re habilitation and applying methodologies for repair- ing structures or demolishing structures.	3			1	3	2	1					
		CO 5	Analyse and asses the damage to structures using various tests	3	2	2	1	2		2					
		CO 1	Define basic terms related to estimation, quantity surveying and contract document	2											
		CO 2	Interpret the item of work from drawings and explain its general specification and unit of measurement.	2	2										
	1402 QUANTITY SURVEYING AND VALUATION	CO 3	Make use of given data from CPWD DAR/DSR for calculating the unit rate of different items of work associated with building construction	3	2										
CET402		CO 4	Develop detailed measurement (including BBS) and BoQ of a various work like buildings, earthwork for road, sanitary and water supply work	3	2										
		CO 5	Explain various basic terms related to valuation of land and building	2	2										
		CO 6	Develop valuation of buildings using different methods of valuation.	3	2										