





HUN 101	LIFE SKILLS	CO 1	Define and Identify different life skills required in personal and professional life						2		1	2	2	1	3		
		CO 2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.									3				2	
		CO 3	Explain the basic mechanics of effective communication and demonstrate these through presentations.						1				1	3			
		CO 4	Take part in group discussions											3		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				3				
MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	CO 1	Compute the derivatives and line integrals of vector functions and learn their applications	3	3	3	3	2	1				1	2		2	
		CO 2	Evaluate surface and volume integrals and learn their inter-relations and applications	3	3	3	3	2	1				1	2		2	
		CO 3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients	3	3	3	3	2	1				1	2		2	
		CO 4	Compute Laplace transform and apply them to solve ODEs arising in engineering	3	3	3	3	2	1				1	2		2	
		CO 5	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering	3	3	3	3	2	1				1	2		2	
HUN 102	PROFESSIONAL COMMUNICATION	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	
		CO 3	Create effective technical presentations						1				1	3			
		CO 4	Discuss a given technical/non-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		
EST 102	PROGRAMING IN C	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 Arithmetic, Logical, Relational or Bitwise operators.	*	*	*	*								*		*
		CO 3	Write readable C programs with arrays, structure or union for storing the data to be processed	*	*	*	*								*		*
		CO 4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem	*	*	*	*								*	*	*
		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	
		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	
CYL 120	ENGINEERING CHEMISTRY LAB	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	
		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	
		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	
ESL 120	CIVIL & MECHANICAL WORKSHOP	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	
		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
		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												
ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	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			
		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	
		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

**SEMESTER - 3**

Course code	Course Name	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
MAT 201	PARTIAL DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS	CO 1	Understand the concept and the solution of partial differential equation.	3	3	3	3	2	1				2	2
		CO 2	Analyse and solve one dimensional wave equation and heat equation.	3	3	3	3	2	1				2	2
		CO 3	Understand complex functions, its continuity differentiability with the use of Cauchy-Riemann equations.	3	3	3	3	2	1				2	2
		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
CET201	MECHANICS OF SOLIDS	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									
		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 loads and bending/twisting moments.	3	2									
		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								
CET 203	Fluid Mechanics and Hydraulics	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									
		CO 3	Estimate the fluid pressure, perform the stability check of bodies under hydrostatic condition	3	3				1					
		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								
	SURVEYING	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						
		CO 2	Apply the principles of surveying for triangulation	3	3		2							

CET205	& GEOMATICS	CO 3	Apply different methods of traverse surveying and traverse balancing	3	3						1	2				
		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
EST 200	DESIGN AND ENGINEERING	CO 1	Explain the different concepts and principles involved in design engineering.	2	1					1			1			
		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	
HUT 200	Professional Ethics	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		
		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	
MCN201	SUSTAINABLE ENGINEERING	CO 1	Understand the relevance and the concept of sustainability and the global initiatives in this direction						2	3					2	
		CO 2	Explain the different types of environmental pollution problems and their sustainable solutions						2	3					2	
		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	
CEL 201	CIVIL ENGINEERING PLANNING &DRAFTING LAB	CO 1	Illustrate ability to organise civil engineering drawings systematically and professionally	3							2	3	3			
		CO 2	Prepare building drawings as per the specified guidelines.	3							2	3	3			
		CO 3	Assess a complete building drawing to include all necessary information	3							2	3	3			
		CO 4	Create a digital form of the building plan using any drafting software	3							2	2	3			
CEL 203	SURVEY LAB	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				
		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

**SEMESTER - 4**

Course code	Course Name	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	
MAT 202	PROBABILITY, STATISTICS AND NUMERICAL METHODS	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
		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
		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
CET202	Engineering Geology	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											
		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
CET 204	GEOTECHNICAL ENGINEERING - I	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											
		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										
CET206	TRANSPORTATION ENGINEERING	CO 1	Apply the basic principles of Highway planning and design highway geometric elements	3	3	3	1		1	3	1		2	1	
		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
		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









		CO 4	Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.	2	2	1			1					3	
		CO 5	Determine the impact of changes in global economic policies on the business opportunities of a firm.	2	2	1								3	
CET308	COMPREHENSIVE COURSE WORK	CO 1	Learn to prepare for a competitive examination	3	1	1			2						
		CO 2	Comprehend the questions in Civil Engineering field and answer them with confidence	3	1				2					3	
		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						
CEL332	TRANSPORTATION ENGINEERING LAB	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			
		CO 3	Characterize bitumen based on its properties so as to recommend it as a pavement construction material.	3			2				1	2			2
		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
CEL 334	CIVIL ENGINEERING SOFTWARE LAB	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
		CO 2	To prepare design details of different structural components, implementation plan for a project.	3	2	2	2	1	3				2	2	2
		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
CET352	ADVANCED CONCRETE TECHNOLOGY	CO 1	To recall the properties and testing procedure of concrete materials as per IS code	3				2	2	3					
		CO 2	To describe the procedure of determining the properties of fresh and hardened concrete	3				2	2	3					
		CO 3	To design concrete mix using IS Code Methods.	3	3	3	2	2	2	3					
		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					
CET 362	ENVIRONMENTAL IMPACT ASSESSMENT	CO 1	To appreciate the need for minimizing the environmental impacts of developmental activities						2	2					
		CO 2	To understand environmental legislation & clearance procedure in the country						2						
		CO 3	To apply various methodologies for assessing the environmental impacts of any developmental activity	2			3	2		3					
		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	

SEMESTER - 7

Course code	Course Name	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
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	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	
CET433	HIGHWAY MATERIALS AND DESIGN	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							
		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

### SEMESTER - 8

Course code	Course Name	Course outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		
CED416	PROJECT PHASE II	CO 1	Model and solve real world problems by applying knowledge across domains	2	2	2	1	2	2	2	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	
		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	
		CO 6	Organize and communicate technical and scientific findings effectively in written and oral forms					2			2	2	3	1	1	
CET434	RAILWAY AND TUNNEL ENGINEERING	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	
		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 ventilation, lining, and lighting in tunnels.	2	2		2	1	2	1	2			2	1	
CET454	CONSTRUCTION METHODS AND EQUIPMENT	CO 1	Explain the various construction procedures for sub structures and super structures	3					1	1	1		1	1		
		CO 2	Describe the various construction activities involved in underground and under water construction	3					1	1	1		1	1		
		CO 3	Demonstrate basic knowledge about construction equipment and machineries	3					1		1		1	1		
		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		

