SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

Academic Year : 2023-2024 Institute/ Branch Name : Symbiosis Institute of Technology Programme Name : Bachelor of Technology (Civil Engineering)

Global | National / Local | Regional / National

Sr. No.	GA No.	Graduate Attributes	PO No.	Programme Outcomes	Relevance
1	GA1	Scholarship: research, inquiry and lifelong learning	PO1	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	
2	GA1	Scholarship: research, inquiry and lifelong learning	PO2	Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.	Global
3	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO3	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	Regional/National
4	GA1	Scholarship: research, inquiry and lifelong learning	PO4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems	
5	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO5	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	Global
6	GA2	Global citizenship: ethical, social and professional understanding	PO6	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	
7	GA3	Eco-literate: sensitivity towards a sustainable environment	PO7	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Regional/National
8	GA2	Global citizenship: ethical, social and professional understanding	PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	
9	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO09	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	Global
10	GA2	Global citizenship: ethical, social and professional understanding	PO10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	
11	GA1	Scholarship: research, inquiry and lifelong learning	PO11	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	National/Local
12	GA1	Scholarship: research, inquiry and lifelong learning	PO12	Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.	
13	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PSO1	To develop the competence of creating and providing sustainable infrastructure, housing, water and wastewater services.	National/Local
14	GA3	Eco-literate: sensitivity towards a sustainable environment	PSO2	To effectively apply engineering fundamentals for the development and management of civil engineering solutions that are sensitive towards the environment for the benefit of society at large.	National/Local

Sr. No.	Semester	T Code	Course Code	Name	CO No	CO Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
	SEM I	TE7168	701210101	Engineering Mathematics -I	CO1	Apply successive differentiation to find nth derivative of product of two functions, to evaluate limits of indeterminate forms and for series expansion of functions.	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO2	Apply the concepts of partial differentiation to solve problems on homogeneous functions, Jacobians and maxima & minima.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Evaluate integrals using reduction formulae and improper integral using DUIS rule and beta-gamma function, Find length, surface area and volume of revolution.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Test the convergence of series of positive terms, alternating series and power series by using appropriate tests, Express the function in the form of a Fourier series.	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Evaluate rank of a matrix, Find Eigen values and Eigen vectors, Transform a matrix to diagonal form.	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO6	Solve system of simultaneous equations and apply Caley-Hamilton theorem to find inverse and higher powers of a matrix	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
		TE7732	701210102	Programming and Logic Building Lab	CO1	Use flowcharts and algorithms to represent simple computational problem.	Moderate-M	Moderate-M	Weak-L	-	Moderate-M	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO2	Solve problems using conditionals and loops in Python.	Moderate-M	Moderate-M	Weak-L	-	Moderate-M	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO3	Use Python lists, tuples and dictionaries to represent compound data.	Moderate-M	Moderate-M	Moderate-M	-	Moderate-M	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO4	Construct Python program by using functions.	Moderate-M	Moderate-M	Moderate-M	-	Moderate-M	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO5	Implement object-oriented programming concepts.	Moderate-M	Moderate-M	Moderate-M	-	Moderate-M	-	-	-	-	Moderate-M	-	Moderate-M	-	-
		TE7683	701210103	Physics for Civil Engineers	CO1	understand the basic principles of heat transfer and evaluate the thermal performance of buildings with reference to the environment	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	demonstrate the knowledge of fundamental concept of simple harmonic oscillations and develop the ability to identify damping forces in a system and methods to minimize the dissipation of energy against them	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	understand the theory of superposition principle and comprehend and interpret the observations of formation of standing waves and variation in wave intensities due to the phenomena of interference	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	realize the importance of light phenomena of diffraction and the concept of resolving power in optical instruments	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-

					CO5	learn the principle of lasing and working of various types of lasers and understand their applications	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
		TE7687	701210104	Physics Lab	CO1	Explain the fundamental concepts and working principle of the Physics experiment and its set-up.	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO2	Practice pre-achieved skills on hardware and devices	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO3	Take apart and reassemble and/or repairing of engineering gadgets	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Explore various aspects of tinkered devices/instruments	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO5	Design and make models out of creativity using raw material	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
		TE7702	701210105	Applied Mechanics	CO1	Determine the components of a force in rectangular or non-rectangular co-ordinates, determine resultants and apply conditions of static equilibrium to plane force systems.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Draw complete and correct free-body diagrams and determine resultants and apply conditions of static equilibrium to plane force systems.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Determine the support reactions of structures, recognize frictional forces acting on a body and analyze these forces	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Apply the basic concepts of kinematics for the application of rectilinear motion	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Apply the knowledge of Work-Energy principle and Impulse-Momentum principle.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO6	Apply the basic concepts of dynamic equilibrium concept on Curvilinear motion	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
		TE7703	701210106	Applied Mechanics Lab	CO1	To Verify Law of polygon of forces and calculate beam reaction	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO2	To Study, compute coefficient of friction and calculate forces in the members of jib crane	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO3	Calculate forces in a jib crane and bello crank lever	Strong-H	Moderate-M	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO4	To study and calculated the moment of inertia of a fly wheel	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO5	Calculate forces in the members of shear leg	Strong-H	Moderate-M	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO6	To study curvilinear motion and compound pendulum	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
		T7925	701210107	Engineering Graphics Lab	CO1	Understand and draw projections of points (0D) located in four quadrants	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO2	Visualize, plan and draw projections of lines (1D) and planes (2D) (inclined to both planes of projection)	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	-	-	-	-
					CO3	Visualize and draw projections of regular solids (3D) (inclined to both planes of projection) and sections of regular solids (front view, top view and true shape)	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	-	-	-	-
					CO4	Visualize and communicate 3D regular/irregular shapes as 2D engineering drawings and vice versa using orthographic/isometric/development principles	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	-	-	-	-
		T7383	701210108	Communication Skills	CO1	Communicate/ express effectively in correspondence.	-	-	-	-	-	-	-	-	Strong-H	Weak-L	-	-	-	-
					CO2	Identify/ Recognize the barriers to effective communication in accordance with all types of communication; avoid or overcome them.	-	-	-	-	-	-	-	-	Strong-H	Moderate-M	-	-	-	-
					CO3	Employ etiquettes and effective communication in written communication.	-	-	-	-	-	-	-	-	Strong-H	Moderate-M	-	-	-	-
					CO4	Compose or create formal reports, memos, agenda, minutes and notices.	-	-	-	-	-	-	-	-	Strong-H	Weak-L	-	-	-	-
					CO5	Create and deliver effective presentations.	-	-	-	-	-	-	-	-	Strong-H	Moderate-M	-	-	-	-
		T7384	701210109	Communication Skills Lab	CO1	Express ideas and concepts well through vocabulary building, LSRW aptitude tests, mind mapping and brain storming.	-	-	-	-	-	-	-	-	Weak-L	Moderate-M	-	-	-	-
					CO2	Demonstrate linguistic competence- through accuracy in grammar, pronunciation and vocabulary.	-	-	-	-	-	-	-	-	Weak-L	Moderate-M	-	-	-	-
					CO3	Sketch their creative side in formal as well as informal communication	-	-	-	-	-	-	-	-	Moderate-M	Strong-H	-	-	-	-
					CO4	Employ etiquettes in oral and written communication.	-	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-
					CO5	Modify their listening skills.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
					CO6	Sketch their articulation while participating in Group discussions, debate or job interviews, presentations and extempore.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
		T6873	701210110	Creative Thinking	CO1	Understand the importance of right brain directed thinking complementing left brain directed thinking	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Employ processes and methods of creative problem solving in real life problems.	-	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Demonstrate creative and innovative thinking skills by the intersection of ideas from one field into another new field.	-	Moderate-M	-	-	-	Moderate-M	-	-	-	Moderate-M	-	-	-	-
					CO4	Explore various disruptive innovations and techniques in the field of Engineering	-	-	-	-	-	-	-	-	-	-	-	Strong-H	-	-
					CO5	Discover the solutions to engineering problems provided by nature and mimic to apply in seeking creative solutions.	-	-	-	-	-	-	Moderate-M	-	-	-	-	-	-	-
		TE7188	701210111	Environmental Science	CO1	Understand about sustainable technologies for resource conservation	Strong-H	Weak-L	Weak-L	-	-	Moderate-M	Strong-H	Weak-L	Weak-L	Moderate-M	-	Moderate-M	Weak-L	Weak-L
					CO2	Identify sources, effects and remedial measures for different pollutions	Weak-L	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	-	Weak-L	Moderate-M	Moderate-M
					CO3	Identify and formalize a generalized water and wastewater treatment process	Moderate-M	Moderate-M	Weak-L	Moderate-M	Weak-L	Strong-H	Strong-H	Weak-L	Weak-L	Moderate-M	-	Moderate-M	Moderate-M	Moderate-M
					CO4	Identify various sources of solid wastes, their effects and latest management techniques	Strong-H	Weak-L	Weak-L	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	Weak-L	Moderate-M	-	Weak-L	Moderate-M	Moderate-M
					CO5	Know about existing environmental laws and legislations and related case studies.	Moderate-M	Weak-L	-	Weak-L	-	Moderate-M	Moderate-M	Weak-L	Weak-L	Moderate-M	-	Weak-L	Weak-L	Weak-L
	SEM-II	TE7169	701210201	Engineering Mathematics - II	CO1	Evaluate multiple integral in different coordinate system.	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO2	Apply multiple integralto find area, volume and centre of mass and gravity.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO3	Identify and solve linear differential equations using suitable method and apply for solving problems from engineering.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO4	Evaluate gradient, divergence, curl, directional derivatives and applyGreen's theorem, Gauss divergence theorem and Stoke's theorem to evaluate vector integration.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
					CO5	Evaluate Laplace transform of various function and solve linear differential	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
		TE7694	701210202	Chemistry	CO1	understand different terms and numericals related to water treatment, and apply different techniques for the same	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	understand the basic concept in polymer chemistry and describe types, mechanism and properties of polymers and composites	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	apply the concepts related to various spectroscopic analysis techniques	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	describe different thermodynamic concepts and solve basic problems in electrochemistry	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	understand the basic concepts related to Green chemistry, environmental chemistry and non-conventional energy sources	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	-	-	-	-	-	-
					CO6	describe the concepts related to fuel chemistry, solve numerical problems and understand the basic concepts in Energy science and Nanomaterials	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
		TE7695	701210203	Chemistry Lab	CO1	Apply the theoretical knowledge related to water analysis to practical use.	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	Strong-H	-	-	-	-	-
					CO2	Prepare a polymer and determine the molecular weight of polymers	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	Strong-H	-	-	-	-	-
					CO3	Identify the percentage of moisture and ash in fuel samples.	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	Strong-H	-	-	-	-	-
					CO4	Utilize the laws of spectroscopy for spectroscopic analysis .	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	Strong-H	-	-	-	-	-
		TE7720	701210204	Digital Land Surveying and Mapping	CO1	Understand objective and methods of surveying and use the scale properly in the maps and plans	-	-	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO2	Define the necessity and principles of surveying	-	-	-	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-
					CO3	Handle basic instruments and methods in Surveying	-	-	-	Weak-L	-	Weak-L	-	-	Strong-H	-	Weak-L	-	-	-
					CO4	Understand the new technology and techniques	Weak-L	-	-	-	-	-	-	-	Strong-H	-	Weak-L	-	-	-
					CO5	Able to prepare map and plan of the surveyed area	-	-	-	-	-	-	-	-	Strong-H	-	Weak-L	-	-	-
		TE7721	701210205	Digital Land Surveying and Mapping Lab	CO1	Observe and analyze topographic characteristics	-	-	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO2	Differentiate methods to perform land survey	-	-	-	Weak-L	-	Moderate-M	-	-	-	-	-	-	-	-
					CO3	Understand the working and operations of various instruments.	-	-	-	Weak-L	-	Moderate-M	-	-	Strong-H	-	Weak-L	-	-	-
					CO4	Understand the digital transformations in land surveying.	Weak-L	-	-	-	-	-	-	-	Strong-H	-	Weak-L	-	-	-
					CO5	Prepare the digital map with all map features in it.	-	-	-	-	-	-	-	-	Strong-H	-	Weak-L	-	-	-

		TE7729	701210206	Introduction to Python Programming Lab	CO1	Learn Python programming and will be capable of developing, debugging, and managing programs	Weak-L	-	Weak-L	-	Weak-L	-	-	-	-	Moderate-M	-	-	-	-
					CO2	Develop proficiency in Python functions, Boolean expressions, and control structures such as selection and iteration.	Strong-H	Weak-L	-	-	Weak-L	-	-	-	-	Weak-L	-	-	-	-
					CO3	Adept at utilizing key Python libraries - Numpy for numerical data handling, Pandas for data analysis, Matplotlib and Seaborn for data visualization	Strong-H	Weak-L	-	-	Weak-L	-	-	-	-	Weak-L	-	-	-	-
					CO4	Use Scikit-learn to implement machine learning algorithms, including linear regression and k-means clustering.	Moderate-M	Weak-L	-	Moderate-M	Weak-L	-	-	-	-	Weak-L	-	-	-	-
		T7957	701210207	Building Construction Technology	CO1	Memorize various components of building, their functional requirements and their specification	Weak-L	-	-	-	-	Moderate-M	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO2	Design and cast concrete cubes in required mix proportions and perform strength tests on it.	Weak-L	-	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO3	Classify shallow and deep foundation into categories and select appropriate foundation for specific scenario.	Weak-L	-	Weak-L	Weak-L	-	-	-	-	-	Weak-L	-	-	-	-
					CO4	Identify the need of damp proofing and outline the methods for accomplishing it.	Weak-L	-	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO5	Explain the properties, types, construction procedure of super structure building elements.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO6	Apply the procedures for testing quality of materials.	Weak-L	-	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	-	-	Moderate-M	Moderate-M
		TE7706	701210208	Basics of Sensors and Microcontrollers	CO1	Understand the circuit connection	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Describe the principle of operation of sensors	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Interface sensors with microcontroller	Weak-L	Moderate-M	-	-	Moderate-M	-	-	-	-	-	-	-	Moderate-M	Weak-L
					CO4	Comprehend sensor applications and need for cloud computing	Weak-L	Moderate-M	-	-	Moderate-M	-	-	-	Strong-H	-	-	-	Moderate-M	Weak-L
		TE7707	701210209	Basics of Sensors and Microcontrollers Lab	CO1	Understand the basic circuit connection	Weak-L	Moderate-M	-	Weak-L	Moderate-M	-	-	-	Strong-H	-	-	-	Moderate-M	Weak-L
					CO2	Describe the principle of operation of DHT11, PIR, Ultrasonic and IR sensors	Weak-L	Moderate-M	-	Weak-L	Moderate-M	-	-	-	Strong-H	-	-	-	Moderate-M	Weak-L
					CO3	Interface DHT11, PIR, Ultrasonic and IR sensors with Arduino and NodeMCU	Weak-L	Moderate-M	-	Weak-L	Moderate-M	-	-	-	Strong-H	-	-	-	Moderate-M	Weak-L
					CO4	Demonstrate cloud platforms such as google firebase and AWS, Microsoft Azure	Weak-L	Moderate-M	-	Weak-L	Moderate-M	-	-	-	Strong-H	-	-	-	Moderate-M	Weak-L
		TE7739	701210210	Software Tools for Civil Engineers	CO1	To understand the basic components of a Ms Excel and their significance.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	To perform arithmetic operations and functions	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	To store, organize and analyze the data using Ms Excel	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	To enable the students in crafting professional word documents, power point presentations using the Microsoft suite of office tools.	Weak-L	Weak-L	-	-	-	-	-	-	-	Weak-L	-	-	-	-
					CO5	To illustrate descriptive statistics using modern tools.	Weak-L	-	-	-	Moderate-M	-	-	-	-	-	-	-	-	-
					CO6	To understand current trends and tools in engineering	Weak-L	-	-	-	Moderate-M	-	-	-	-	-	-	-	-	-
		T6732	701210211	Critical Thinking	CO1	Acquire better decisions based on logical thinking.	-	Moderate-M	Weak-L	Moderate-M	-	-	-	-	Weak-L	-	-	Moderate-M	-	-
					CO2	Identify and evaluate facts in an argument.	-	Moderate-M	Weak-L	Moderate-M	-	-	-	-	Weak-L	-	-	Moderate-M	-	-
					CO3	Draw truth, ambiguity, vagueness and fallacy in arguments.	-	Moderate-M	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	-	-
					CO4	Construct questions to reach conclusions.	-	Weak-L	Weak-L	Weak-L	-	-	-	-	-	-	-	Weak-L	-	-
		TE7300	701210212	Tinker Lab	CO1	Relate fundamental concepts/laws of science and engineering	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO2	Practice pre-achieved skills on hardware and devices	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO3	Take apart and reassemble and/or repairing of engineering gadgets	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Explore various aspects of tinkered devices/instruments	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO5	Design and make models out of creativity using raw material	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	-	Moderate-M	-	-
					CO6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SEM III	TE7740	701210301	Strength of Materials	CO1	To determine safe working stresses for components and moment of inertia for various cross-sections.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO2	Calculate direct normal, shear, and bearing stresses.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO3	Describe stress vs. strain graph and determine yield strength, ultimate strength, and modulus of elasticity.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO4	Determine bending stress and shear stress relative to beam design.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO5	Calculate buckling of axially and eccentrically loaded columns.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
							Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
		TE7730	701210302	Materials Testing Lab	CO1	Determine the physical properties of cement and aggregates.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Determine the compressive strength of concrete.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Perform the quality tests on concrete.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Determine hardness and strain energy of different materials.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Perform bending stress and shear test on different materials.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO6	Determine tensile strength on mild steel and tor steel.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T7388	701210303	Engineering Mathematics-III	CO1	Use Cauchyâ€™s residue theorem, Cauchyâ€™s integral theorem and Cauchyâ€™s integral formula to evaluate contour integrals.	Strong-H	Strong-H	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-
					CO2	Represent the given function in Fourier integral representation, find Fourier transforms and inverse Fourier transforms.	Strong-H	Strong-H	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-
					CO3	Apply Z-transform to solve difference equations.	Strong-H	Strong-H	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-
					CO4	Describe the nature of partial differential equations and solve partial differential equations.	Strong-H	Strong-H	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-
		T7674	701210304	Cyber Security	CO1	Analyze and illustrate threat models	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	Weak-L	Weak-L	Weak-L	Strong-H	Strong-H	Weak-L	-	-	-
					CO2	Examine the different cyber laws and their importance	Strong-H	Strong-H	Strong-H	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	Strong-H	Strong-H	Weak-L	-	-	-
					CO3	Compare and contrast the implemented management practices in the cyber world	Strong-H	Strong-H	Strong-H	Weak-L	Strong-H	Moderate-M	Weak-L	Moderate-M	Strong-H	Strong-H	Weak-L	-	-	-
					CO4	Illustrate Symmetric and Asymmetric Encryption mechanisms	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	Moderate-M	Weak-L	Weak-L	Strong-H	Strong-H	Weak-L	-	-	-
		T7966	701210305	Advanced Surveying Lab	CO1	Demonstrate and handle survey instruments like dumpy and auto level, 10â€, 20â€ and electronic theodolite, and Total Station etc.	-	-	-	-	Weak-L	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO2	Develop skills and logic for carrying out different methods of surveying with above mentioned instruments.	-	Weak-L	-	Weak-L	-	Moderate-M	-	-	-	-	-	-	Weak-L	Weak-L
					CO3	Carry out survey to establish controls & locate details over a property/estate & find out its area	-	-	-	Weak-L	-	Moderate-M	-	-	Strong-H	-	Weak-L	-	Weak-L	Weak-L
					CO4	Carryout alignment survey to fix a route for roads, railways etc	Weak-L	-	-	-	-	-	-	-	Strong-H	-	Weak-L	-	Weak-L	Weak-L
					CO5	Carry out survey for ghat sections and curved sections of road and railways.	-	-	-	-	-	-	-	-	Strong-H	-	Weak-L	-	Weak-L	Weak-L
					CO6	Plot & prepare survey plans/maps & sections.	-	-	-	Weak-L	Weak-L	-	-	-	Strong-H	-	Weak-L	-	Moderate-M	Moderate-M
		TE7290	701210306	Project Based Learning -I	CO1	Build a small group and develop skills specific to collaborative efforts, solve more complex problems than they could on their own, delegate roles and responsibilities	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO2	Develop a practice to share diverse perspectives, pool knowledge and skills, hold one another (and be held) accountable	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO3	Learn how to solve problems that are important to them, including real life issues using their prior knowledge and learn effectively how to learn new concepts, processes for solution of the problemâ€"even learning from failure and possibly starting over	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO4	Apply creative thinking skills to innovate new ideas and possibilities solution of the problem	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO5	build on their research skills and deepen their learning of applied content beyond facts or memorization	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO6	Build their voice and learn to take pride in their work, boosting their confidence, learn to look at problems with a critical thinking lens, asking questions and coming up with possible solutions for their project	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L

		TE7710	701210307	Computer Aided Building Design and Drawing Lab	CO1	Demonstrate different types of scales, lines, dimensioning patterns, abbreviations and symbols as per IS codes.	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO2	Illustrate line plan and preparing working drawings for residential buildings.	Strong-H	-	-	-	Strong-H	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	Moderate-M	Moderate-M
					CO3	Illustrate line plan and preparing working drawings for Public buildings.	Strong-H	-	-	-	Strong-H	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	Moderate-M	Moderate-M
					CO4	Prepare different elevation drawings for aesthetic and sectional details.	Strong-H	-	-	-	Strong-H	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	Strong-H	Strong-H
					CO5	Study and draw perspective drawing of various objects.	-	-	Strong-H	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	Weak-L	Weak-L
					CO6		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		TE7400	701210308	Introduction to Fluid Mechanics	CO1	Apply basic conceptsof properties of fluids andthe fundaments of dimensional analysis and application of Buckingam -theorem insolving practical problems.	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO2	Understand the significance of basic principles of fluid statics and application ofhydrostatic law in determining forces on surfaces and hydraulic structures, floatation andstability of floating bodies.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO3	Understand the principles of kinematics with specific emphasis on application ofcontinuity equation, stream function etc.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO4	Apply the principles of Bernoullis equation in measurement of discharge in pipes, andin other pipe flow problems.	Strong-H	Strong-H	-	Strong-H	-	-	-	-	-	-	-	-	-	Weak-L
					CO5	Develop basic concept related to laminar flow and apply for various applications.	Moderate-M	Strong-H	-	-	-	-	-	-	-	-	-	Weak-L	-	Weak-L
					CO6	Apply fundamental concepts of fluid mechanics in solving fluid flow problems in pipes and analysis of pipe networks.	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	Moderate-M	Weak-L
		TE7728	701210309	Introduction to Fluid Mechanics Lab	CO1	Calibrate flow measuring devices used in pipes and plot flownets	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO2	Characterize laminar and turbulent flows	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO3	Study of stability of floating bodies	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO4	Define dimensional parameters and state its application.	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO5	State and verify Bernoullis Theorem.	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Weak-L
					CO6	Understand pipe network analysis	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Weak-L
		T4005	701210310	Integrated Disaster Management *	CO1	To enable studentunderstand varioustypes of disasters,its preparednessand management.	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	-
					CO2	To instill knowledgeon reducingdisasters andcapacity buildingthrough communityparticipation.	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	Strong-H	-	-	-	-
					CO3	To train students toperform First aidand CPR in an emergency.	Weak-L	Weak-L	Moderate-M	Moderate-M	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Moderate-M	-	-	-	-
		T6184	701210311	Basic German I	CO1	Greet & introduce in German language	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO2	Form simple sentences and list the numbers as per the German language.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO3	Write the answers in German language.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO4	Communicate in German language.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
		T6186	701210312	Basic French I	CO1	Basic greetings and introducing yourself in French.	-	-	-	-	-	-	-	-	-	-	-	Weak-L	-	-
					CO2	Numbers, nationalities, languages, professions in French.	-	-	-	-	-	-	-	-	-	-	-	Weak-L	-	-
					CO3	Talking about free time activities, likings, Family members.	-	-	-	-	-	-	-	-	-	-	-	Weak-L	-	-
					CO4	To be able to tell time, daily routine, classroom objects.	-	-	-	-	-	-	-	-	-	-	-	Weak-L	-	-
		T6188	701210313	Basic Spanish I	CO1	Basic greetings, alphabates, self introduction in Spanish	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO2	Numbers, nationalities, languages, professions in French.	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO3	Colours, how to tell the time, how to talk about linking, describing daily routine	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO4	Regular verbs conjugations, class objects & articles	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
					CO5	Vocabulary of all family relations, physical description vocabulary & adjectives	-	-	-	-	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-
	SEM IV	T8000	701210401	Service Learning	CO1	Participate in the community related activties	-	-	-	-	Moderate-M	Moderate-M	Moderate-M	-	Strong-H	Strong-H	-	Moderate-M	Strong-H	Strong-H
					CO2	Think, discuss and implement their experiences	-	-	-	-	Moderate-M	Strong-H	Moderate-M	-	Moderate-M	Strong-H	-	Moderate-M	Strong-H	Strong-H
					CO3	Apply skills and knowledge in real life situations	-	-	-	-	Moderate-M	-	Moderate-M	-	Weak-L	Strong-H	-	Strong-H	Strong-H	Strong-H
					CO4	Inculcate sense of caring	-	-	-	-	Moderate-M	-	Moderate-M	-	Strong-H	Weak-L	-	Moderate-M	Strong-H	Strong-H
		TE7691	701210402	Statistics, Probability and Numerical Methods	CO1	Use numerical methods to solve algebraic and transcendental equations.	Strong-H	Strong-H	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-
					CO2	Apply interpolation formulae to predict the value of any intermediate term and evaluate integration by numerical methods.	Strong-H	Strong-H	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-
					CO3	Determine numerical solutions of ordinary differential equations.	Strong-H	Strong-H	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-
					CO4	Calculate measures of dispersions, coefficient of variation, coefficient of correlation.	Strong-H	Strong-H	-	Strong-H	-	-	-	-	-	-	-	-	-	-
					CO5	Estimate the value of dependent variable using regression analysis.	Strong-H	Strong-H	-	Strong-H	-	-	-	-	-	-	-	-	-	-
					CO6	Compute probabilities using probability distributions (discrete and continuous).	Strong-H	Strong-H	-	Moderate-M	-	-	-	-	-	-	-	-	-	-
		TE7692	701210403	Statistics, Probability and Numerical Methods Lab	CO1	Use MATLAB Built in functions to carry out matrix operations. Calculate Eigen values, Eigen vectors using MATLAB.	Strong-H	Strong-H	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Moderate-M	Weak-L	Weak-L
					CO2	Compute solution of system of simultaneous equations by gauss elimination.	Strong-H	Strong-H	Moderate-M	Weak-L	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Moderate-M	Weak-L	Weak-L
					CO3	Write a code to evaluate numerical interpolation, differentiation and integration	Strong-H	Strong-H	Moderate-M	Weak-L	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Moderate-M	Weak-L	Weak-L
					CO4	Find numerical solution of ordinary differential equations using MATLAB code.	Strong-H	Strong-H	Moderate-M	Weak-L	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L
					CO5	Write MATLAB code for solving partial differential equations using finite difference methods.	Strong-H	Strong-H	Moderate-M	Weak-L	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L
					CO6	Use R software to carry out statistical computations	Strong-H	Strong-H	Strong-H	Moderate-M	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Moderate-M	Weak-L	Weak-L
		TE7711	701210404	Computer Aided Structural Analysis-I	CO1	To define and calculate determinacy of various types of structure.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	To analyze and calculate the slope and deflection of structures by methods like Macaulay's method, moment area method, conjugate beam method and Castigliano's method.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	To analyze indeterminate structures by the methods like Castigliano's Energy theorems, three moment theorem.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	To analyze the determinate and indeterminate truss by Castigliano's theorem.	Weak-L	Moderate-M	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO5	To analyze determinate and indeterminate beams, single bay single storied portal frame by plastic analysis.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO6	To calculate reactions, shear force and bending moment using influence line diagram of simply supported, overhanging and compound beams.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
		T6774	701210405	Principles of Economics	CO1	Explain the basics of principles of economics	-	-	-	-	-	Moderate-M	-	-	-	-	Moderate-M	-	-	-
					CO2	Develop an understanding of how data is collected and analysed and theory is formulated.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	-	Moderate-M	Moderate-M
					CO3	Knowing the behaviour of consumesr and producers and characteristics of different market structure and relationship between cost and output.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	Moderate-M	Weak-L	Strong-H
					CO4	Understanding the macroeconomic variables .	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	Moderate-M	Weak-L	Strong-H
		TE7404	701210406	Open Channel Flow	CO1	Understand and apply basic terminology of open channel flow and solve problems involving energy balance.	Weak-L	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Moderate-M	-	-	Weak-L	Moderate-M	-	Moderate-M
					CO2	Classify various types of flow based upon the channel bed and conditions on downstream of the channel	Weak-L	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Moderate-M	Moderate-M	-	-	Moderate-M	Strong-H	-	Moderate-M
					CO3	Explain the phenomenon of hydraulic jump and its uses	Weak-L	Moderate-M	Strong-H	Weak-L	Strong-H	Moderate-M	Strong-H	Weak-L	-	-	-	Strong-H	-	Moderate-M
					CO4	Utilize exact and integral solutions to the boundary layer equations to estimate boundary layer thickness and overall drag.	Weak-L	Moderate-M	-	-	Strong-H	Strong-H	Strong-H	Moderate-M	-	-	-	Moderate-M	-	Moderate-M
					CO5	Apply integral form of the boundary layer equations to derive expressions for boundary. layer thickness, displacement thickness, momentum thickness and overall drag.	Weak-L	Moderate-M	Moderate-M	-	Moderate-M	Moderate-M	Strong-H	-	-	-	-	Moderate-M	-	Moderate-M
					CO6	Explain the concept of drag, lift and forces acting on submerged bodies	Weak-L	Weak-L	Moderate-M	Moderate-M	Strong-H	Strong-H	Strong-H	-	-	-	-	Moderate-M	Weak-L	Moderate-M
		TE7731	701210407	Open Channel Flow Simulation Lab	CO1	Determine Manningâ€™s roughness coefficient for the given open channel	Weak-L	-	-	Moderate-M	-	Moderate-M	-	Moderate-M	-	-	-	-	Weak-L	Moderate-M

					CO2	Examine flow around a circular cylinder and air foil	Moderate-M	-	-	Moderate-M	-	Moderate-M	-	Moderate-M	Weak-L	-	-	-	-	Moderate-M
					CO3	Study of velocity distribution in open channel flow.	Weak-L	-	Weak-L	Moderate-M	-	Strong-H	-	Moderate-M	Weak-L	-	-	-	Weak-L	Moderate-M
					CO4	Estimate flow rate by using different notches	Moderate-M	-	-	Weak-L	-	Strong-H	-	Moderate-M	-	-	-	-	-	Moderate-M
					CO5	Study of uniform flow formulae in open channel	Weak-L	-	-	Weak-L	-	Moderate-M	-	-	-	Weak-L	-	-	-	Moderate-M
					CO6	Study of specific energy curve in open channel	Weak-L	-	-	Weak-L	-	Strong-H	-	Moderate-M	Strong-H	Weak-L	-	-	-	Moderate-M
		TE7723	701210408	Geotechnical Engineering	CO1	Evaluate geotechnical investigation methods suitable at a particular site based on soil conditions. Describe petrology and interpret occurrence of structural features	Strong-H	Weak-L	-	Moderate-M	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO2	Infer index properties of soil and interpret soil behaviour.	-	Weak-L	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO3	Appraise the importance of seepage and permeability and asses this property in soil.	Strong-H	-	-	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO4	Relate Compaction and consolidation properties of soil to overall soil mass behaviour on foundation.	Strong-H	Strong-H	-	Moderate-M	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO5	Evaluate stress distribution in soil and understand the concept of pressure bulbs	Strong-H	Strong-H	-	Moderate-M	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO6	Illustrate various methods of stability of slopes	Strong-H	Strong-H	Weak-L	Weak-L	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
		TE7724	701210409	Geotechnical Engineering Lab	CO1	State and identify various igneous rocks, sedimentary rocks, metamorphic rocks. Analyze geological maps and extract information for structural features.	Strong-H	Strong-H	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO2	Understand the basic properties of soil,Perform dry sieve analysis in order to determine the particle size distribution of a given soil sample.	Strong-H	Strong-H	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO3	Classify and define consistency limits of a given clay sample using Casagrande method.	Strong-H	Strong-H	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO4	Distinguish the procedure of constant head and falling head method for determining permeability characteristics of a given soil sample.	Strong-H	Strong-H	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO5	Explain Standard proctor test for estimating dry density of a soil sample	Strong-H	Strong-H	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
					CO6	Determine soil shear parameters by different tests	Strong-H	Strong-H	Moderate-M	-	-	Weak-L	-	Weak-L	Weak-L	Moderate-M	-	Weak-L	-	-
		T2646	701210410	Entrepreneurship Venture	CO1	To familiarize the students with basics of entrepreneurship, its advantages & challenges.	Weak-L	-	-	-	-	Strong-H	-	-	-	-	-	Weak-L	-	-
					CO2	Identify entrepreneurship opportunities and understand various funding means.	-	-	-	-	-	Moderate-M	-	Weak-L	-	-	Strong-H	Weak-L	-	-
					CO3	Understands the steps to form an organization.	-	Weak-L	-	Weak-L	Weak-L	-	-	-	Moderate-M	-	Strong-H	-	-	-
					CO4	Create a business and marketing plan.	-	Weak-L	Moderate-M	Weak-L	Weak-L	-	-	-	Moderate-M	-	Strong-H	-	-	-
		T6872	701210411	Foundation of Ethics	CO1	To understand the tenets of ethics which are part of daily life.	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-	-
					CO2	To gain knowledge of ethical theories.	-	-	-	-	-	-	-	Strong-H	-	-	-	Moderate-M	-	-
					CO3	To reason clearly and precisely about ethical and moral issues in professional life.	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-	-
					CO4	To provide solutions to moral conflics in professional life.	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-	-
		T6760	701210412	Introduction to Indian Philosophy	CO1	Understanding basic concepts of Philosophy	Moderate-M	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-
					CO2	Understand classification of Schools of Indian Philosophy	Moderate-M	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-
					CO3	Understand principals of Non-Vedic Schools of Indian Philosophy	Moderate-M	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-
					CO4	Understand principals of Vedic Schools of Indian Philosophy	Moderate-M	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-
					CO5	Understand the way of life recommended by Vedic schools of Indian Philosophy	Moderate-M	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-
					CO6	Understand the way of life recommended by Non-Vedic schools of Indian Philosophy	Moderate-M	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-
	SEM V	T7416	701210501	Environmental Engineering I	CO1	Identify various natural sources available and compare their suitability for water supply.	Weak-L	-	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	Weak-L
					CO2	Define and study different infiltration galleries and Intake works.	Weak-L	-	Moderate-M	Weak-L	-	Moderate-M	Weak-L	-	-	-	-	-	Weak-L	Weak-L
					CO3	Estimate demand of water and list the various types of demands and fluctuations in demand	Moderate-M	-	Weak-L	-	-	-	Weak-L	-	-	Weak-L	-	-	Weak-L	Moderate-M
					CO4	Forecast population using different population forecast methods and compare them	Moderate-M	-	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	Moderate-M
					CO5	List different types of water distribution systems and their working.	Weak-L	-	Weak-L	-	-	-	Weak-L	-	-	-	-	-	Weak-L	Moderate-M
					CO6	List the various causes of wastage of water in water distribution system and study the measures of prevention.	-	-	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	Moderate-M
		T7417	701210502	Environmental Engineering I Lab	CO1	Understand the physical characteristics of water	Weak-L	-	-	Weak-L	-	Moderate-M	Weak-L	-	Weak-L	Weak-L	-	-	Weak-L	Weak-L
					CO2	Perform common environmental experiments relating to water quality,	Weak-L	-	-	Weak-L	-	Moderate-M	Weak-L	-	Weak-L	Weak-L	-	-	Weak-L	Weak-L
					CO3	Suggest and perform appropriate experiments for given water sample	Weak-L	-	-	Weak-L	-	Moderate-M	Weak-L	-	Weak-L	Weak-L	-	-	Weak-L	Weak-L
					CO4	Statistically analyze and interpret laboratorial results	Weak-L	-	-	Weak-L	-	Moderate-M	Weak-L	-	Weak-L	Weak-L	-	-	Weak-L	Weak-L
					CO5	Apply the laboratorial results to problem identification, quantification, and basic environmental design and technical solutions.	Weak-L	-	-	Weak-L	-	Moderate-M	Weak-L	-	Weak-L	Weak-L	-	-	Weak-L	Weak-L
					CO6	Understand and use the water sampling procedures and sample preservations	Weak-L	-	-	Weak-L	-	Moderate-M	Weak-L	-	Weak-L	Weak-L	-	-	Weak-L	Weak-L
		F7063	701210503	Construction Project Management Practices	CO1	Understand application of CPM and PERT	Weak-L	-	-	-	Weak-L	Moderate-M	-	-	-	-	Weak-L	-	-	Weak-L
					CO2	Recommend optimum resource allocation and project duration	Weak-L	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-	-	Weak-L
					CO3	Understand safety norms to provide safer work environment	-	-	-	-	-	Strong-H	-	-	-	-	-	-	-	Weak-L
					CO4	Use materials management techniques	Weak-L	-	-	-	-	Moderate-M	-	-	-	-	Weak-L	-	-	Weak-L
					CO5	Recommend the suitable tools and equipment for the given situation.	Weak-L	-	-	-	Weak-L	Moderate-M	-	-	-	-	-	-	Weak-L	Weak-L
					CO6	Use the feasible advanced techniques for various civil engineering projects.	Weak-L	-	-	-	Weak-L	-	Weak-L	-	-	-	-	-	-	Weak-L
		TE7406	701210504	Structural Analysis-II	CO1	To analyze continuous beam by displacement method like slope and deflection.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO2	To analyze continuous beam by displacement method like moment distribution.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO3	To analyze two and three hinged arches through the procedure for the determination of horizontal thrust, radial shear and normal thrust.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO4	To analyze continuous beam and frame by flexibility method.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO5	To analyze continuous beam and frame by stiffness method.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
		TE7408	701210505	Structural Design-I	CO1	To define the properties of materials used in reinforced concrete design,different methods of structural design such as working stress method, Limit state method	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Weak-L
					CO2	To determine the flexure, shear, torsion and bond for singly and doubly reinforced beam.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Weak-L
					CO3	Able to design the beam.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Weak-L
					CO4	Able to design slabs and staircase.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Weak-L
					CO5	Able to design column and footing.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Weak-L
		T7440	701210506	Structural Design I Lab.	CO1	To understand the design by limit state theory IS:456 .	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO2	To understand the RCC beam design	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO3	To understand Slab design using IS 456.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO4	To understand Column and footing design	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO5	To understand staircase design.	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Weak-L	Moderate-M
		T6749	701210507	Design Thinking	CO1	To Understand and Apply Design Thinking Approach, best practices & nuances, Global Scenario for Innovation & Entrepreneurship	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	Strong-H	Strong-H	-	Moderate-M	Weak-L	Weak-L
					CO2	To Learn & Develop Mindset, Attitude and 21st Century Skills as problem solver and innovator needed by professionals nowadays	Strong-H	Moderate-M	Strong-H	-	Strong-H	-	-	-	Strong-H	Strong-H	-	Moderate-M	Weak-L	Weak-L
					CO3	To Observe and Investigate the real and hidden needs of the user for complex problem scenario and Analyze & Synthesize the research data to define correct and final problem statement	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	Strong-H	Strong-H	-	Moderate-M	Weak-L	Weak-L
					CO4	To Evaluate the ideas and Create Prototyping and Iterative Mindset for successful product development	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	-	-	-	Strong-H	Strong-H	-	Moderate-M	Weak-L	Weak-L
		TE7291	701210508	Project Based Learning-II	CO1	Build a small group and develop skills specific to collaborative efforts, solve more complex problems than they could on their own, delegate roles and responsibilities.	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO2	Develop a practice to share diverse perspectives, pool knowledge and skills, hold one another (and be held) accountable	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L

					CO3	Learn how to solve problems that are important to them, including real life issues using their prior knowledge and learn effectively how to learn new concepts, processes for solution of the problemâ€"even learning from failure and possibly starting over.	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO4	Apply creative thinking skills to innovate new ideas and possibilities solution of the problem.	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO5	build on their research skills and deepen their learning of applied content beyond facts or memorization,	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
					CO6	Build their voice and learn to take pride in their work, boosting their confidence, learn to look at problems with a critical thinking lens, asking questions and coming up with possible solutions for their project.	Strong-H	Weak-L	Weak-L	Weak-L	-	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L
		TE7407	701210509	Quantity Surveying and Valuation	CO1	Understand Planning and organizing for an estimate and estimating the cost of general conditions.	Weak-L	-	-	-	-	-	-	-	-	Weak-L	-	Weak-L	Moderate-M	Strong-H
					CO2	Write specification of building works, road work and irrigation works and prepare detailed estimate of a building.	-	-	-	-	-	-	-	-	Moderate-M	-	-	Moderate-M	Moderate-M	Strong-H
					CO3	Prepare detailed estimate of RCC frame structured residential buildings and carry out rate analysis of various construction entities.	Weak-L	Weak-L	-	-	Weak-L	-	-	-	Strong-H	Weak-L	Moderate-M	Weak-L	Moderate-M	Strong-H
					CO4	Prepare detailed estimate of earthwork in roads.	Weak-L	Weak-L	-	-	Weak-L	-	-	-	-	-	Weak-L	-	Moderate-M	Strong-H
					CO5	Carry out valuation of buildings.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	Moderate-M	Weak-L	Moderate-M	Strong-H
					CO6	Write tender documents viz. tender notice, tender schedule and conditions of contracts regarding time, labour payment, damages etc.	-	-	-	-	-	Strong-H	-	Strong-H	-	Weak-L	Weak-L	Moderate-M	Moderate-M	Strong-H
		TE7417	701210512	Advanced Concrete Technology	CO1	Understand in detail concrete making materials including supplementary cementitious materials	-	-	-	-	-	-	Weak-L	-	-	-	-	-	Weak-L	-
					CO2	Make appropriate decision regarding ingredient selection and use of concrete	Weak-L	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO3	Explain and execute mix proportioning of concrete.	Weak-L	-	-	Weak-L	-	-	Weak-L	-	-	Weak-L	-	-	Weak-L	-
					CO4	Estimate engineering properties of concrete.	-	-	Weak-L	-	Weak-L	-	-	-	-	-	-	-	Weak-L	Moderate-M
					CO5	Summarize the tests to be conducted on fresh and hardened concrete.	-	-	-	-	Weak-L	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO6	Discuss about the usability of concrete designed for special purposes.	-	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	Strong-H
		T7955	701210514	Professional Practices in Construction	CO1	Classify various methods of tenders and contracts.	-	-	-	-	Weak-L	-	-	Moderate-M	-	Weak-L	-	-	Moderate-M	Moderate-M
					CO2	Define various laws related to construction practices.	-	-	-	-	Weak-L	Strong-H	-	Moderate-M	Moderate-M	Weak-L	-	Weak-L	Moderate-M	Moderate-M
					CO3	Understand contract documents in preparation for competitive bidding and improve technical communication through tender document and other technical document drafting.	Moderate-M	-	-	-	-	Moderate-M	-	Strong-H	Strong-H	Moderate-M	Weak-L	Weak-L	Moderate-M	Moderate-M
					CO4	Understand construction law and arbitration practice.	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-	Weak-L	-	Moderate-M	Moderate-M
					CO5	Understand the probable risks and safety measures to be followed on a project.	-	-	-	-	Weak-L	Moderate-M	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO6	Exhibit professional ethics and know the professional rights.	-	-	-	-	Weak-L	Strong-H	Weak-L	Strong-H	-	Weak-L	-	Moderate-M	Moderate-M	Moderate-M
							-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SEM VI	T7419	701210601	Environmental Engineering II	CO1	1. Explain the storm water characteristics.Compute storm water discharge for given catchment for design of drains.	Moderate-M	Weak-L	-	Weak-L	Weak-L	Moderate-M	Moderate-M	-	-	-	-	-	Weak-L	-
					CO2	2. Describe the physical, chemical and biological characteristics of waste water and the objectives & steps of preliminary treatment of waste water.	Weak-L	Weak-L	Moderate-M	Moderate-M	-	Moderate-M	Moderate-M	-	-	-	-	-	-	-
					CO3	3. Describe the purpose and steps in design of secondary treatment of waste water by biological methods.	Moderate-M	Moderate-M	Moderate-M	-	-	Moderate-M	Moderate-M	Moderate-M	-	Weak-L	-	Weak-L	Moderate-M	Weak-L
					CO4	4. Discuss different low cost waste water treatment like Oxidation ponds, Aerated Lagoon etc.State the working principle and design of septic tank.	Weak-L	-	-	-	-	Moderate-M	Moderate-M	-	-	Weak-L	-	Weak-L	-	-
					CO5	5. Explain the characteristics of solid waste.Express different methods of disposal of solid waste.	Weak-L	-	-	Weak-L	-	Moderate-M	Moderate-M	-	-	Weak-L	-	-	-	-
					CO6	6. Explain different treatment flow for industrial waste water treatment.	Weak-L	-	Weak-L	-	-	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	-	-	Weak-L	Weak-L
		F7071	701210602	Highway and Metro Engineering Practices and Innovation	CO1	Gain an understanding of how highways and metro systems have developed over time, their influence on cities, and the basic design rules, and use this knowledge to tackle design problems.	Moderate-M	Strong-H	Strong-H	-	Weak-L	-	Moderate-M	Weak-L	-	-	-	-	Strong-H	Moderate-M
					CO2	Choose the right materials and use current construction methods for building highways and metros, focusing on how to build roads and tunnels.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	Moderate-M	Strong-H
					CO3	Explore and apply new smart and sustainable technologies to transportation systems, and plan for their ongoing upkeep and improvement.	Weak-L	Moderate-M	Moderate-M	Weak-L	Strong-H	Moderate-M	Weak-L	Weak-L	-	-	-	-	Moderate-M	Strong-H
					CO4	Show skill in managing transportation projects, including how to plan, schedule, budget, and assess their environmental and social effects.	Moderate-M	Moderate-M	Weak-L	Moderate-M	Weak-L	Strong-H	Weak-L	Weak-L	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Weak-L	Weak-L
					CO5	Study real-world transportation projects to learn from them, stay ahead of new technology trends, and practice ethically in the field of transportation engineering. Understand the Employment scope and prospects in infrastructure engineering.	Strong-H	Weak-L	Moderate-M	Strong-H	Moderate-M	Weak-L	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Weak-L	Strong-H	Strong-H	Moderate-M
		TE7410	701210603	Structural Design-II	CO1	Identify grades of steel and list various rolled steel sections available for construction of steel design, analyze tension member for strength due to yielding, rupture and block shear	Weak-L	-	Weak-L	-	-	Strong-H	-	Moderate-M	-	-	-	-	Weak-L	-
					CO2	Able to design flexural member and beam to beam and beam to column connections by bolt or weld.	Weak-L	-	Weak-L	-	-	Strong-H	-	Moderate-M	-	-	-	-	Weak-L	-
					CO3	Able to design of slab base, gusseted base, column base for axial load and uniaxial bending.	Weak-L	-	Weak-L	-	-	Strong-H	-	Moderate-M	-	-	-	-	Weak-L	-
					CO4	Able to design welder plate girder.	Weak-L	-	Weak-L	-	-	Strong-H	-	Moderate-M	-	-	-	-	Weak-L	-
					CO5	To understand assessment of various kind of loads on purlin and roof truss and to design.	Weak-L	-	Weak-L	-	-	Strong-H	-	Moderate-M	-	-	-	-	Weak-L	-
							-	-	-	-	-	-	-	-	-	-	-	-	-	-
		T7802	701210604	Capstone Course	CO1	To prepare students for technical competitive exams.	Strong-H	-	-	Weak-L	-	-	-	-	-	-	-	-	Strong-H	-
					CO2	To prepare students for higher education abroad.	-	Weak-L	-	Weak-L	-	-	-	-	Moderate-M	-	-	Weak-L	Strong-H	-
					CO3	To facilitate students' professional development.	-	-	-	-	-	-	-	-	Strong-H	-	-	Weak-L	Strong-H	-
					CO4	To help students develop extracurricular skills for placements.	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	Strong-H	-
		F7072	701210605	Highway and Metro Engineering Lab	CO1	Perform standard tests on highway and metro rail engineering materials.	Strong-H	-	-	-	Moderate-M	-	-	-	-	-	-	-	Strong-H	-
					CO2	Use surveying tools for the layout and alignment of transportation projects.	-	Strong-H	-	Moderate-M	-	-	-	-	-	-	-	-	-	Strong-H
					CO3	Understand the application of software tools in design and analysis.	-	-	Strong-H	-	-	-	Moderate-M	Moderate-M	-	-	-	-	-	Strong-H
					CO4	Observe and document construction practices and innovation on-site visits.	-	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	Moderate-M
					CO5	Develop skills to work effectively as a part of a team in a lab and field environment	-	-	-	-	Strong-H	-	-	-	-	Moderate-M	Moderate-M	-	-	-
		T6774	701210606	Principles of Economics	CO1	Explain the basics of principles of economics	-	-	-	-	-	Moderate-M	-	-	-	-	Moderate-M	-	-	-
					CO2	Develop an understanding of how data is collected and analysed and theory is formulated.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	-	Moderate-M	Moderate-M
					CO3	Knowing the behaviour of consumesr and producers and characteristics of different market structure and relationship between cost and output.	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	Moderate-M	Weak-L	Strong-H
					CO4	Understanding the macroeconomic variables .	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	Moderate-M	Weak-L	Strong-H
		TE7409	701210608	Bridge Engineering	CO1	Describe the components of bridges, standard specifications used in bridges analysis and design	Weak-L	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO2	Analyse and design the types of culverts	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO3	Analyse and design the Tbeams and Slabs of the bridges	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO4	Analyse and design the bridge substructure	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO5	Analyse and design the bridge fordations-open well and pile foundations	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
		TE7411	701210610	Airport Planning and Design	CO1	Understand the importance and limitations of air transportation, describe the components of aeroplane, understand the terminologies associated with the aircraft	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Understand the aircraft characteristics, planning and site selection for airports	Moderate-M	-	-	-	Weak-L	-	Strong-H	-	-	-	-	-	Weak-L	Weak-L
					CO3	Understand layouts of airports and their requirements.	Weak-L	-	Moderate-M	-	Weak-L	-	Strong-H	-	Strong-H	-	-	-	Weak-L	Weak-L
					CO4	Understand Airport classifications, runways and taxiways orientations and their standards	Weak-L	-	-	-	-	-	-	-	Strong-H	-	-	-	Weak-L	Weak-L
					CO5	Design the airport pavement using PCA methods	-	-	Weak-L	-	Strong-H	-	Weak-L	-	-	-	-	-	Weak-L	-

		TE7412	701210611	Introduction to Remote Sensing and GIS	CO1	Explain the concept of GIS and different data formats in GIS	Moderate-M	-	-	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO2	Demonstrate digital data preparation using GIS software	Moderate-M	Weak-L	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	Weak-L	-	-	-	-
					CO3	Prepare map with all its components on any of the GIS application	Moderate-M	-	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-
					CO4	Describe energy interactions in the atmosphere and energy interaction with the earth surface features.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Explain the fundamentals of all three forms of remote sensing viz. Optical, Microwave and Hyperspectral	Weak-L	-	-	-	Moderate-M	-	-	-	-	Moderate-M	-	-	-	-
					CO6	Illustrate remote sensing information extraction.	Weak-L	Weak-L	Weak-L	Moderate-M	Strong-H	-	-	-	-	-	-	-	-	-
		TE7189	701210612	Environmental Systems	CO1	Sample the waste water using waste water sampling technic.	Weak-L	-	-	Weak-L	-	-	-	-	-	-	-	-	-	-
					CO2	Determine the presence of different types of phosphorus and nitrate contents present in waste water using the photo spectrometer.	Moderate-M	-	-	Moderate-M	-	-	Weak-L	-	Weak-L	-	-	-	Strong-H	Strong-H
					CO3	Calculate the biological of oxygen demands of waste water. Analyze the chemical of oxygen demands of waste water.	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	Moderate-M	-	-	-	Strong-H	Strong-H
					CO4	Compare the electrical conductivity for waste water sample collected.Determine the turbidity of waste water and discuss on the results. Determine the pH value of waste water and discuss on the results.	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	Moderate-M	-	-	-	Strong-H	Strong-H
					CO5	Discuss the different types of sewers appurtenances like storm water inlets, overflows, inverted siphons, automatic flushing tanks, ventilation in sewers.	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	-	-	-	-	Strong-H	Strong-H
					CO6	Determine the sludge volume index of given waste water sample.	Moderate-M	-	-	Moderate-M	-	-	-	-	-	-	-	-	-	-
		TE7191	701210615	Environmental Systems Lab	CO1	Sample the waste water using waste water sampling technic.	Weak-L	-	-	Weak-L	-	-	-	-	-	-	-	-	-	-
					CO2	Determine the presence of different types of phosphorus and nitrate contents present in waste water using the photo spectrometer.	Moderate-M	-	-	Moderate-M	-	-	Weak-L	-	Weak-L	-	-	-	Strong-H	Strong-H
					CO3	Calculate the biological of oxygen demands of waste water. Analyze the chemical of oxygen demands of waste water.	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	Moderate-M	-	-	-	Strong-H	Strong-H
					CO4	Compare the electrical conductivity for waste water sample collected.Determine the turbidity of waste water and discuss on the results. Determine the pH value of waste water and discuss on the results.	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	Moderate-M	-	-	-	Strong-H	Strong-H
					CO5	Discuss the different types of sewers appurtenances like storm water inlets, overflows, inverted siphons, automatic flushing tanks, ventilation in sewers.	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	-	-	-	-	Strong-H	Strong-H
					CO6	Determine the sludge volume index of given waste water sample.	Moderate-M	-	-	Moderate-M	-	-	-	-	-	-	-	-	-	-
		TE7351	701210627	3D Printing and Prototyping	CO1	Understand what Advanced/Additive manufacturing (AM) is and understand important technology trends for product development and innovation.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	Weak-L	Weak-L
					CO2	Exhibit comprehensive knowledge of the broad range of AM processes, devices, capabilities and materials that are available.	Moderate-M	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-
					CO3	Understand the various softwareâ€™s, processes and techniques that enable advanced/additive manufacturing and peculiar fabrication.	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO4	Learn how to make physical objects that fulfil product development/prototyping requirements, using advanced/additive manufacturing devices and processes.	Strong-H	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-	Weak-L	Weak-L
		TE7387	701210628	Project Management	CO1	Discuss various facets of construction project and its management. Explain principles of management and discuss types of organizations.	Strong-H	Moderate-M	Weak-L	-	-	Weak-L	-	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	-
					CO2	Select appropriate technique like CPM & PERT for project management. Explain resources planning, allocation to optimize resources, crashing and updating	Strong-H	Moderate-M	Weak-L	Weak-L	-	Weak-L	-	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	-
					CO3	Select method for effective material management. Indicate optimum site layout for the construction work	Strong-H	Moderate-M	Weak-L	Weak-L	-	Weak-L	-	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	-
					CO4	Identify zones of danger and select appropriate methods of safety. Describe laws of economics applicable to project	Strong-H	Moderate-M	Weak-L	-	-	Weak-L	-	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	-
					CO5	Discuss factors related to budget, actual expenditures and profits. Express ethical practices in project management	Strong-H	Moderate-M	Weak-L	-	-	Weak-L	-	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	-
					CO6	Restate general and special conditions of contract document	Strong-H	Moderate-M	Weak-L	-	-	Weak-L	-	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	-
	SEM VII	T7804	701210701	B.Tech Project	CO1	Design and build socially relevant projects that meet the stated specifications	Strong-H	Weak-L	Moderate-M	Moderate-M	-	-	-	-	Weak-L	-	-	Weak-L	Weak-L	Moderate-M
					CO2	Manage schedules and budgets that will ensure that projects are completed on time and within the planned budget.	-	-	-	Weak-L	-	-	-	-	Weak-L	-	-	-	Strong-H	Strong-H
					CO3	Use the relavant and available software and hardware tools to simulate, design, fabricate and test the performance of the product	-	Weak-L	-	Strong-H	Weak-L	Moderate-M	-	-	-	Weak-L	-	-	Strong-H	Strong-H
					CO4	Communicate ideas and solutions effectively both verbally and in writing.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H
					CO5	Act with integrity, show initiative and leadership	-	-	Weak-L	Weak-L	-	-	-	Strong-H	Moderate-M	-	-	-	Strong-H	Strong-H
					CO6	Accept responsibility while working towards stated goals	-	-	-	-	-	-	-	-	Moderate-M	-	-	-	Strong-H	Strong-H
		T7674	701210702	Cyber Security	CO1	Analyze and illustrate threat models	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	Weak-L	Weak-L	Weak-L	Strong-H	Strong-H	Weak-L	-	-	-
					CO2	Examine the different cyber laws and their importance	Strong-H	Strong-H	Strong-H	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	Strong-H	Strong-H	Weak-L	-	-	-
					CO3	Compare and contrast the implemented management practices in the cyber world	Strong-H	Strong-H	Strong-H	Weak-L	Strong-H	Moderate-M	Weak-L	Moderate-M	Strong-H	Strong-H	Weak-L	-	-	-
					CO4	Illustrate Symmetric and Asymmetric Encryption mechanisms	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	Moderate-M	Weak-L	Weak-L	Strong-H	Strong-H	Weak-L	-	-	-
		T2585	701210703	Organizational Behaviour	CO1	Describe how behavior affects the organizational performance and effectiveness.	Moderate-M	Moderate-M	Moderate-M	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	-
					CO2	Identify the factors affecting individual behavior at work place.	Moderate-M	Moderate-M	Moderate-M	Weak-L	Moderate-M	-	-	-	-	-	-	-	Moderate-M	-
					CO3	Demonstrate the importance of team dynamics in organizations.	Moderate-M	Moderate-M	Moderate-M	Weak-L	Weak-L	-	-	-	-	-	-	-	Moderate-M	-
					CO4	Appreciate the differences in organizational cultural values.	Strong-H	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	Moderate-M	-
					CO5	Distinguish between the characteristics of managers and leaders.	Strong-H	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	Moderate-M	-
					CO6	Understand and apply the knowledge of individual differences at workplace.	Strong-H	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	Moderate-M	-
		T7955	701210709	Professional Practices in Construction	CO1	Classify various methods of tenders and contracts.	-	-	-	-	Weak-L	-	-	Moderate-M	-	Weak-L	-	-	Moderate-M	Moderate-M
					CO2	Define various laws related to construction practices.	-	-	-	-	Weak-L	Strong-H	-	Moderate-M	Moderate-M	Weak-L	-	Weak-L	Moderate-M	Moderate-M
					CO3	Understand contract documents in preparation for competitive bidding and improve technical communication through tender document and other technical document drafting.	Moderate-M	-	-	-	-	Moderate-M	-	Strong-H	Strong-H	Moderate-M	Weak-L	Weak-L	Moderate-M	Moderate-M
					CO4	Understand construction law and arbitration practice.	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-	Weak-L	-	Moderate-M	Moderate-M
					CO5	Understand the probable risks and safety measures to be followed on a project.	-	-	-	-	Weak-L	Moderate-M	-	-	-	-	-	-	Moderate-M	Moderate-M
					CO6	Exhibit professional ethics and know the professional rights.	-	-	-	-	Weak-L	Strong-H	Weak-L	Strong-H	-	Weak-L	-	Moderate-M	Moderate-M	Moderate-M
		TE7231	701210712	Sustainable Construction Methods	CO1	Types of foundations and various construction methods with respect to sustainability.	-	-	-	-	-	-	Strong-H	Moderate-M	-	-	-	-	Strong-H	Strong-H
					CO2	Basics construction methods for steel structures for tall structures and for Bridges	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-	Strong-H	Strong-H
					CO3	Demonstrate an ability to evaluate and/or design whole or parts of projects, taking into account not only the financial and economic issues but also the social and environmental impacts affecting the sustainability of infrastructure	-	-	-	Weak-L	-	-	Strong-H	Moderate-M	Strong-H	-	-	-	Strong-H	Strong-H
					CO4	Understand the basics of green construction projects	-	-	-	-	-	Strong-H	Strong-H	Strong-H	-	-	-	Weak-L	Strong-H	Strong-H
					CO5	Preparation for the LEED Green Associate professional licensing.	-	-	-	-	-	Strong-H	Strong-H	Strong-H	-	Moderate-M	Strong-H	Weak-L	Strong-H	Strong-H
		TE7422	701210716	Traffic Engineering	CO1	Apply the concepts of passenger car units for mixed traffic flow, design hourly volume, critical hour, Price-volume relationships and demand functions in design of traffic facilities.	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Moderate-M
					CO2	Understand the various Traffic Engineering Studies and Analysis	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H
					CO3	Explain traffic movements, types of intersections, islands, crossings and their design.	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H
					CO4	Recall the traffic regulations, pollution caused by traffic and the method of controlling pollution	Weak-L	-	-	-	-	-	-	-	-	Moderate-M	-	-	-	Strong-H
					CO5	Illustrate the design of signals and explain the redesigning of existing signals, Evaluation and design of road lighting.	Weak-L	-	-	-	-	-	-	-	Strong-H	Weak-L	-	-	-	Strong-H
					CO6	Understand the fundamentals of traffic management system, Describe the traffic management process for the areas	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H

		TE7214	701210719	Pre-stressed Concrete Structure	CO1	Understand techniques of pre-stressing, pre-stressing systems, loss of pre-stress	Weak-L	-	Weak-L	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
					CO2	Analyze pre-stressed concrete sections	Weak-L	-	Weak-L	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
					CO3	Design of pre-stressed concrete sections for flexure	Weak-L	-	Weak-L	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
					CO4	Design for shear	Weak-L	-	Weak-L	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
					CO5	To understand End zone stresses in pre-stressed concrete members	Weak-L	-	Weak-L	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
					CO6	Design of pre-stressed concrete beams and slabs	-	-	-	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
		TE7215	701210722	Prestressed Concrete Structure Lab	CO1	Understand techniques of pre-stressing, pre-stressing systems, loss of pre-stress	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO2	Analyze pre-stressed concrete sections	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO3	Design of pre-stressed concrete sections for flexure	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO4	Design for shear	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO5	To understand End zone stresses in pre-stressed concrete members	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
					CO6	Design of pre-stressed concrete beams and slabs	Weak-L	-	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Strong-H
		TE7700	701210729	Smart Materials	CO1	Describe the importance of smart materials on the basis of their applications	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Explain and evaluate the structure, electrical and magnetic properties of materials.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Classify the smart materials in terms of their unique electric and magnetic properties.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Identify some special smart materials	Moderate-M	-	-	-	-	Moderate-M	-	-	-	-	-	-	-	-
					CO5	Explain some important application of smart materials	Strong-H	-	-	-	-	Moderate-M	-	-	-	-	-	-	Strong-H	Strong-H
	SEM VIII	T7912	701210801	Internship	CO1	Integrate theory and practice to apply civil engineering concepts, principles, and techniques in real-world scenarios, bridging the gap between academic coursework and professional experience.	Moderate-M	Strong-H	Moderate-M	Strong-H	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Moderate-M	Moderate-M	Strong-H	Strong-H
					CO2	Cultivate professional work habits and attitudes during the civil engineering internship, fostering responsibility, punctuality, teamwork, adaptability, and a strong work ethic for enhanced professional development and career preparation.	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Strong-H	Moderate-M	Moderate-M	Weak-L	Weak-L	Strong-H	Strong-H
					CO3	Develop and demonstrate effective communication, interpersonal, and critical skills during the civil engineering internship, including clear and concise presentation of technical information, collaboration with interdisciplinary teams, and active participation in professional discussions, meetings, and presentations.	Moderate-M	Moderate-M	Weak-L	Strong-H	Moderate-M	Weak-L	Weak-L	Weak-L	Moderate-M	Moderate-M	Moderate-M	Strong-H	Strong-H	Strong-H
					CO4	Foster lifelong learning through field internship experience, enhancing problem-solving skills by tackling real-world challenges in civil engineering.	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Moderate-M	Strong-H	Moderate-M	Moderate-M	Strong-H	Strong-H
		T7802	701210802	Seminar	CO1	Apply critical thinking to evaluate data and analyze case studies in assessing project feasibility.	Weak-L	Strong-H	Moderate-M	Moderate-M	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	Moderate-M	Strong-H	Strong-H
					CO2	Demonstrate ethical conduct, responsibility, and adherence to industry standards through proficient technical writing.	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	Moderate-M	Strong-H	Weak-L	Moderate-M	Strong-H	Strong-H
					CO3	Develop research skills to critically analyze literature and technical reports in civil engineering.	Moderate-M	Moderate-M	Weak-L	Strong-H	Moderate-M	Weak-L	Weak-L	Weak-L	Moderate-M	Moderate-M	Moderate-M	Strong-H	Strong-H	Strong-H
					CO4	Effectively communicate complex information in civil engineering through well-structured presentations.	Weak-L	Weak-L	Weak-L	Moderate-M	Weak-L	Weak-L	Weak-L	Weak-L	Moderate-M	Strong-H	Moderate-M	Moderate-M	Strong-H	Strong-H