



DEPARTMENT OF CIVIL ENGINEERING

PROGRAM ARTICULATION MATRIX

Articulation Matrix- B. Tech Civil Engineering

Academic year 2022-23

Sl No	Course Code	Course Title	CO	Description	1	2	3	4	5	6	7	8	9	10	11	12	1	2		
1	22UC1101	Integrated Professional English	CO 1	Understand the concepts of grammar to improve communication, reading, and writing skills										1						
			CO 2	Demonstrate required knowledge over Dos and Don'ts of speaking in the corporate context. Demonstrate ability to face formal situations / interactions.										1						
			CO 3	Understand the varieties of reading and comprehend the tone and style of the author. Skim and scan effectively and appreciate rhetorical devices											1					
			CO 4	Apply the concepts of writing to draft corporate letters, emails, and memos												1				
2	22UC1202	English Proficiency	CO 1	Demonstrating different interpersonal skills for employability								1								
			CO 2	Distinguishing business essential skills										1						
			CO 3	Classifying social media and corporate communication skills														1		
			CO 4	Applying analytical thinking skills														2		
			CO 1	Developing critical and analytical reading skills													1			
			CO 2	Discovering different interpersonal skills to develop people skills														1		

3	22UC2103	Essential Skills for Employability	CO 3	To enhance the problem-solving skills of the students through the concepts of Simple Equations, Ratio, Proportion & Variation, Percentages, Profit & Loss, Averages, Allegations, Simple & Compound Interest					1											
			CO 4	Apply diagrammatic representation of the given data to find the possible outcomes in the topics of Deductions, Cubes, Venn Diagrams and Arrangements		1														
			CO 5	To apply deductive logic to solve questions in Connectives, Blood relations, Ranking and time sequence, Symbols and notations. Apply principles of reflection and rotation to solve picture puzzles.		1														
4	22UC2204	Corporate Readiness Skills	CO 1	To distinguish product and process and quote them in speaking and writing activities												1				
			CO 2	To apply interpersonal skills													1			
			CO 3	To enhance the problem-solving skills of the students through the concepts of Numbers, Time & Work, Time & Distance, Permutations & Combinations, Probability which will enable them to improve their problem solving abilities which in turn improve their programming skills.					1											
			CO 4	To apply known facts to find the unknowns in the topics Clocks, Calendars, Binary Logic. Identify the rule set by analyzing the given observations in the topics Series, Analogy, Odd Man, Coding-Decoding			1													
5	22UC0010	Universal Human Values & Professional Ethics	CO 1	Realize and Understand the basic aspiration, harmony in the human being.				2												
			CO 2	Envisage the roadmap to fulfill the basic aspiration of human beings.				2												
			CO 3	Understanding the society and nature with the view of human values				2												
			CO 4	Understand the profession and his role in this existence.							2									
6	22CE4102	Construction Planning & Project	CO 1	Apply the fundamentals of construction management to plan and control the progress of the project.	1										3	1				
			CO 2	Analyse the project progress through scheduling and identifying critical activities.				2							3	1				

			CO 2	Use analytical techniques for analyzing forces in statically determinate structures.				3											
			CO 3	Understanding the concepts of planar and non- planar system of parallel forces and analyzing them. Estimate moment of inertia of lamina and material bodies	2												3		
			CO 4	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems													3		
15	22UC1203	Design Thinking and Innovation	CO 1	Understand the importance of Design thinking process for contextualized problems		1				1									
			CO 2	Analyse, define, and ideate for solutions			1			1									
			CO 3	Develop and test the prototype made					2		2								
			CO 4	Explore the fundamentals of entrepreneurship skills for transforming the challenge into an opportunity					1			1							
16	22PH1002	Engineering Physics	CO 1	Understands the deformation of materials in response to action of load, for identification of materials having specific engineering applications.	1														
			CO 2	Understands the motion of electrons in microscopic	2														
			CO 3	level	3														
			CO 4	Understand the properties of light and engineering applications of lasers	2														
			CO 5	Apply the knowledge on structure and properties of materials while executing related experiments and develop some inter disciplinary projects	3														
17	21CY1001	Engineering Chemistry (SE-2)	CO 1	Describe some important design considerations in choosing a battery for a specific application.	1		2				3								
			CO 2	Predict potential complications from combining various chemicals or metals in an engineering setting	2		3												
			CO 3	Examine water quality and select appropriate purification technique for intended problem	3							2							
			CO 4	Explain the role of chemical kinetics in the formation and destruction of ozone in the atmosphere and predict the connection between molecular behavior and observable physical properties	3								2						

35	22CE3103	Transportation Engineering	CO 1	Know Versatile with history - current trends of transportation and Carry engineering surveys and can decide the alignment							2	2					2	2		
			CO 2	Analyze and design highway geometric elements		2	2												2	2
			CO 3	Analyze and design of flexible, rigid pavements, Pavement Drainage		2	2						1						2	2
			CO 4	Handle pavement construction activities and also conduct quality control at site and Evaluate pavement condition and can identify and suggest remedial measures, understand traffic Rules, Analyze and design of traffic infrastructure			2		2	2	2	3							2	2
36	22CE3102	Water Resources Engineering	CO 1	Evaluate the different components of hydrological cycle	3			2			1							2		
			CO 2	Estimate the ground water yield and requirement of water for the crops	3	2					1								2	
			CO 3	Design the canal irrigation system based on discharge	3			3			1									2
			CO 4	Analyze stability and forces acting on Gravity dams and life of reservoir	3			2			1									2
37	22CE3201	Design Of Steel Structures	CO 1	Analyse and design bolted and welded connections	2	2	2											1	1	
			CO 2	Design single and compound beams as per IS code	2	2	2												1	1
			CO 3	Design simple and built-up columns as per IS code	2	2	2												1	1
			CO 4	Design column base systems as per IS code, Calculate wind forces and design roof trusses	2	2	2					2							1	1
38	22CE3202	Quantity Surveying and Estimation	CO 1	Applying the methods of approximate estimate and detailed estimate to the buildings.	1	2											2			
			CO 2	Applying the methods of detailed estimates to R.C.C works, Roads and Canals	1	2												2		
			CO 3	Applying the specifications concept to for different items of work and performing rate analysis.	1	2												2		
			CO 4	Applying tenders and contracts concept to a project and carry out building valuation.	1	2												2		
			CO 5	Applying estimation concept to buildings, road works, canal works by using a software package (M.S Excel)	1													3		

		Concrete Structures	CO 4	Differentiate types of rectangular water tanks and analyse as per IS code methods, select types of circular water tanks and analyse as per IS code methods	2	2	2										1	1			
43	22CE3231	Prestressed concrete	CO 1	To introduce prestressing methods, principles and concepts	2	2											1	1			
			CO 2	To determine losses in prestress	2	2											1	1			
			CO 3	To Analyse PSC Sections both at transfer of prestress and Service load conditions	2	2							1					1	1		
			CO 4	To design prestressed concrete beams as per IS Code, to design end block of PSC beams.	2	2												1	1		
44	22CE4141	Bridge engineering	CO 1	Explain about various types of Bridges and IRC Specifications for road bridges													1				
			CO 2	Design deck Slab bridge and T-Beam Bridge as per IRC guidelines	3		2											1			
			CO 3	Design Abutment and Elastomeric Pad Bearings for bridges as per IRC guidelines	3		2												1		
			CO 4	Design Piers and Well Foundations for bridges as per IRC guidelines	3		2												1		
45	22CE4151	Precast and Prefabricated structures	CO 1	Analyze the prefabricated load carrying members.		2												2			
			CO 2	Analyze Behaviour of structural components and production technology of prefabrication.		2													2		
			CO 3	Design joints in precast construction.			1													2	
			CO 4	Design and detail precast structures.			1													2	
46	22CE3216	Projects & Contract management	CO 1	Understand the concept of construction laws and regulations.					2		2								2		
			CO 2	Study the current trend toward alternative project delivery systems via contractual arrangements such as design-build and construction management at risk										2					3		
			CO 3	Investigate how to avoid the possibilities of construction disputes via alternative dispute resolution (ADR)							3		3							3	
			CO 4	Understand the Labour regulations and applications on review construction contracts and specifications							3					3				3	

			CO 2	Understand & Apply the concept of effective stress principle, and porewater pressures and their distribution within a soil mass, determine the consolidation settlement , and determine soil strength parameters from soil tests for “drained” and “undrained” conditions.	3	3												3	
			CO 3	Determine the lateral earth pressure, stability of slopes and retaining walls, Understand the importance and methods of soil investigations and be able to plan a soil investigation	3	3													3
			CO 4	Understand Terzaghi’s shear failure criteria for soils and their limitations and determine the bearing capacity and settlement of structures founded on soils using shallow and pile foundations.	3	3													3
			CO 5	Analyze the index and engineering properties of soils from various laboratory tests and prepare the soil investigation report.			3	1	1				3	1				3	3
55	22CE4153	Forensics in Civil Engineering	CO 1	Apply forensic engineering to demonstrate structural and geotechnical failures	2	2	2											2	
			CO 2	Understand reinforced concrete Structures and steel structure failures through case studies	2	2	2											2	
			CO 3	Evaluate different geotechnical failures through case studies	2	2	2											2	
			CO 4	Analyze reasons for geo-environmental and fluid and hydraulic failures	2	2	2												
56	22CE3215	Intelligent transportation systems	CO 1	Understand the Objectives ITS		2	2			2								2	2
			CO 2	Understand the Importance of telecommunications in the ITS system		2	2			2				3		1		2	2
			CO 3	Understand Advanced Traffic Management Systems		2	2			2								2	2
			CO 4	Understand Integration of Automated Highway Systems			2			2					1			2	2
57	22CE3225	Pavement materials & design	CO 1	Characterize pavement materials and also carry the advance tests on bituminous mixtures	1			1										1	1
			CO 2	Thorough with stresses and strains of flexible and rigid pavements.	1	1										2		1	1

			CO 3	Thorough with analysis and design of flexible highway and airport pavements	1		1					2				1	1	
			CO 4	Thorough with analysis and design of rigid highway and airport pavements	2		2									1	1	
58	22CE3235	Traffic engineering and management	CO 1	Apply the Concepts of Probability in traffic Engineering	3							3		3	2	2	2	2
			CO 2	Know the Fundamental design concepts of Interchanges, Parking Facilities, Freeways			2									2	2	
			CO 3	Design Traffic Facilities include Un signalized Intersections (Rotary), Signalized Intersection (signal design)			3									2	2	
			CO 4	Know the Accident Situation in India, road safety measures, Understand Detrimental Effects of traffic on the environment					3	3						2	2	
59	22CE4145	Urban transportation systems planning.	CO 1	Learn the concept of travel demand and supply and modes available for transportation					2	2			3	3		2	2	
			CO 2	Understand the different types of Traffic Surveys used in planning				2							3	2	2	
			CO 3	Identify and analyze trips as a part of transport planning			3	3								2	2	
			CO 4	Plan Public Transport Systems, Utilize ITS in Transport Planning		2		2	2	2						2	2	
60	22CE4155	Railway engineering airport planning and design	CO 1	Understand about the Classification of Railways, Permanent Way & its components, functions.					2		3					2	2	
			CO 2	Analyze track alignment, geometric elements, Horizontal and Vertical curves, super elevation, and Negative Super elevation.			2						2	2		2	2	
			CO 3	Understand about the various factors affecting Selection of site for Airport.					2						2	2	2	
			CO 4	Geometric Design of Runway, Computation of Runway length, Correction for runway length, Understand the layout of port components and operation of navigational aids that involved in functions of ports.			2		2	2						2	2	

