MAHARAJA RANJIT SINGH PUNJAB TECHNICAL UNIVERSITY BATHINDA-151001 (PUNJAB) INDIA

(A State University Estb. by Govt. of Punjab vide Punjab Act No. 5 of 2015 and Approved u/s 2(f) & 12 (B) of UGC; Member AIU)

Department: **CIVIL ENGINEERING**
Giani Zail Singh Campus College of Engineering & Technology MRSPTU, Bathinda

Programme: M.Tech Civil Engg. (Construction

COURSE ARTICULATION MATRIX

Subject	S Code	Semester	Credit	Duration (Hrs)	L TP	COs	Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
Project Planning and Control	MCIE6-101	1st	04	45	3 1 0	CO1	Understanding the concept of planning, monitoring and controlling projects, Create project management strategies.	-	3	-	-	3	-	-	-	3	3	-
						CO2	Knowledge of optimization of resources and man power.	2	-	3	-	3	-	-	-	3	3	1
						CO3	Understanding about the safety in construction industry and supervision of construction projects.	-	2	1	-	2	-	-	-	3	-	2

Construction Engineering and Management	MCIE6-102	1st	04	45	3 1 0	CO1	Students get awareness of principles of construction Management and decision making in construction Industry.	2	-	-	-	3	-	-	-	3	3	-
						CO2	Student get knowledge about Applications of mobilization, cost time schedules and MIS(Management information system) technique in the real time construction operation	3	-	3	2	-	-	-	-	2	3	1
						CO3	Students get Knowledge of work measurement application in construction industry.	-	2	1	-	2	-	-	-	2	-	2
Concrete Construction Technology	MCIE6-103	1st	04	45	3 1 0	CO1	The knowledge of what concrete is, how it is formed, what materials are involved and properties and requirements of each concrete ingredient	3	2	-	2	2	-	-	-	3	2	3
						CO2	Ability to perform various tests on concrete ingredients and also on concrete (Fresh and Hardened)	-	3		3	3	-	2	2	2	3	-
						CO3	Ability to analyze various special concrete and their applications	-	2	3	-	-	3	-	2	2	-	3
Software Lab – Project Planning	MCIE6-104	1st	02	48	0 0 4	CO1	Visualize things/ concepts and express the thoughts in the form of sketches, chart, models, etc	3	-	-	3	2	-	3	2	3	2	2
						CO2	Apply various Codal provisions related to Civil Engineering.	-	-	3	-	-	-	2	2	-	3	3

						CO3	The students will be able to apply their knowledge of structural mechanics in addressing design problems of structural engineering.	3	3	2	-	2	3	-	3	2	3	3
COMPUTATIONAL TECHNIQUES	MCIE6-156	1st	04	45	3 1 0	CO1	Student will be able to implement the basic principles of numerical techniques in day to day application of Civil Engineering.	-	-	-	-	1	-	-	-	-	-	2
						CO2	Students get knowledge for solving complex mathematical problems using only simple arithmetic operations and using the numerical analysis facilities.	2	-	1	-	2	-	-	-	-	-	2
						CO3	Students get Knowledge for the solution of linear, non-linear & transcendental equations, interpolation, integration and differential equations.	-	-	1	-	2	-	-	-	-	-	2
Environmental Engineering & Management	MCIE6-157	1st	04	45	3 1 0	CO1	Students will be able to understand the major global environmental issues, their causes, sources, management and laws/polices related to these technologies involved in eco-friendly production and mechanism of carbon credits.	-	-	-	-	-	1	-	3	-	1	1
						CO2	Students get knowledge about the major principles of environmental impact assessment and the implications of current rules and regulations in relation to environmental impact assessment.	1	-	-	-	1	1	-	3	-	1	1
						CO3	Students get awareness about the causes, implications and management of local environmental issues like land degradation, wasteland and water logging.	-	-	-	-	-	1	-	3	-	1	1
Maintenance of Building Structures	MCIE6-158	1st	04	45	3 1 0	CO1	Apply principles of compatibility of materials	3	-	-	2	2	-	-	3	2	3	2

						CO2	Assess the requirement of maintenance and retrofitting in structures	-	2	3	2	-	2	-	2	3	3	3
						CO3	Identify different methodologies of maintenance and retrofitting in structures	3	3	3	-	2	2	2	3	3	3	3
Composite Materials	MCIE6-159	1st	04	45	3 1 0	CO1	Identify and understand the basic mechanical behaviour of composite materials and make sound prediction on the likely behaviour of new combinations of materials.	3	2	-	-	-	-	-	1	3	2	-
						CO2	Apply knowledge of composite mechanical performance and manufacturing methods to design a composite's project.	3	-	3	-	2	-	-	-	2	3	-
						CO3	Demonstrate a practical understanding of composite properties and fabrication techniques, and to be able to make realistic suggestions for the evaluation of composite behaviour, where appropriate.	-	3	3	-	1	-	-	-	3	3	2
Construction laws & Contract Management	MCIE6-205	2nd	04	45	3 1 0	CO1	Apply relevant contract practices, procedures and standard forms of contracts for building, infrastructure & other construction projects.	2	-	-	3	-	2	-	-	3	-	1
						CO2	Knowledge and apply the fundamental laws and legal requirements applicable to construction and infrastructure management.	2	-	-	-	2	-	-	-	3	-	-
						CO3	Integrate professional procedures and regulations (addressing safety, health, social cultural, and environmental factors) in engineering project contracts/contractual relationships.	-	-	-	2	3	-	-	3	3	-	2
Building Cost & Quality Management	MCIE6-206	2nd	04	45	3 1 0	CO1	Students will be able to know the modern trends in project management viz. design, construction, and resource utilization and cost estimation.	2	-	2	-	3	-	-	-	3	3	-

						CO2	Students will be able to know the concepts in economics and finance in civil constructions.	3	-	-	2	3	-	-	-	-	3	2
						CO3	Students will be able to know the quality control aspects in planning, systems, management, assurance and improvement techniques.	-	2	2	-	-	-	2	-	2	-	2
QA & QC LAB	MCIE6-207	2nd	02	45	0 0 4	CO1	Reproduce the basic knowledge of mathematics, science and engineering in assessing the quality and suitability of construction materials, structural element & preparation of test reports as per the IS specification by inculcating professional and ethical responsibility in the areas of material testing & modern instrument usage.	3	2	3	2	2	3	-	-	3	3	2
						CO2	Formulate and solve in teams in order to improve future problem solving ability in material engineering and able to present it.	3	3	3	3	3	-	3	-	2	2	3
						CO3	Compare experimental results to the theoretical results and write technical reports.	3	3	2	2	-	-	-	3	2	3	3
Construction Costing & Financial Management	MCIE6-260	2nd	04	45	3 1 0	CO1	A basic ability to plan, control and monitor construction projects with respect to time and cost	3	2	3	3	-	-	-	2	-	2	2
						CO2	Apply fundamentals of management to utilize functions of management in construction. Like Demonstrate leadership qualities by implementing construction project processes with control.	3	2	2	2	3	3	3	2	3	3	3
						CO3	Apply construction management practices and principles to a project and lead the team for efficient project management considering economical and financial factors.	3	-	2	-	3	2	3	2	3	3	3

PROJECT SAFETY MANAGEMENT	MCIE6-261	2nd	04	45	3 1 0	CO1	Student will be able to understand and compliance with health and safety legislation relevant to Civil Engineering projects.	2	-	-	-	3	-	-	-	2	-	-
						CO2	Students get knowledge about the awareness of the construction project risks and the legal requirements for project safety.	1	-	-	-	3	-	-	-	-	1	-
						CO3	Student get Knowledge about the documentation and record keeping for the various activities like safety trainings, safety meetings, safety audits, safety measures and inspections etc. carried out for the safety of the persons working on the construction project.	2	-	-	-	3	-	-	-	-	-	2
Foundation Design and Construction	MCIE6-262	2nd	04	45	3 1 0	CO1	Knowledge about the design shallow footings based on dimensions, thickness, area and length.	-	3	2	-	2	-	-	-	3	2	-
						CO2	Analyse earth retaining structures to determine earth pressures.	3	-	3	--	2	-	-	-	3	2	2
						CO3	Knowledge about the design and construction of special foundation.	2	3	1	-	2	-	-	-	3	2	-
RURAL CONSTRUCTION TECHNOLOGY	MCIE6-263	2nd	04	45	3 1 0	CO1	Students learn about appropriate technologies and materials to be used to construct low-cost houses in the rural areas.	3	-	2	-	1	-	-	1	2	3	-
						CO2	Students get to learn about various rural technologies which are used to provide proper water supply and sanitation facilities to rural population at a lesser cost.	2	-	3	1	-	-	2	-	1	-	1
						CO3	Students get familiar with rural road construction technologies and indigenous methods of transportation used by people in rural areas.	2	2	1	-	2	-	-	2	-	-	2

Advanced Structural Design & Detailing	MCIE6-364	3rd	04	45	3 1 0	CO1	Ability to design for Earthquake and reinforcement detailing for different components of RCC building frames.	3	3	-	3	-	2	-	-	-	3	-
						CO2	Ability to design and reinforcement detailing for Earthen buildings as per IS Codes.	2	3	3	2	-	-	-	-	2	-	3
						CO3	Ability to design and reinforcement detailing for masonry structures as per IS Codes.	2	3	-	2	-	-	-	-	-	2	-
						CO4	Ability to understand earthquake effect on building and strengthen the structure.	3	3	3	-	-	-	3	3	-	2	3
Pavement Design, Construction & Maintenance	MCIE6-365	3rd	04	45	3 1 0	CO1	Students get to learn about various design methods of flexible and rigid pavements prevalent in different parts of the world with comprehensive learning of IRC code methods used in India.	-	3	2	-	1	-	-	-	1	2	1
						CO2	Students learn about various engineering methods used for construction of different types of pavement structures.	3	-	2	1	-	-	1	-	1	3	1
						CO3	Students get familiar with the methods of evaluation of pavement structures and to undertake various types of maintenance management strategies.	3	2	1	-	2	-	-	2	3	-	-
Research Methodology	MREM0-101	3rd	04	45	4 0 0	CO1	Analyze and investigate the business problems and develop into research problems.	2	3	-	-	1	-	-	-	-	2	-
						CO2	Identify and apply the latest appropriate research approaches and techniques for developing solutions of research problem.	-	3	-	-	-	2	-	-	-	3	2

						CO3	Relate ethical and philosophical consideration in business research.	-	-	-	-	2	2	-	2	-	-	2
						CO4	Apply various statistical techniques and present the research findings in report form.	2	3	-	-	-	3	-	-	-	1	3