

Academic Year : 2023-2024 Institute/ Branch Name : Symbiosis Institute of Technology Programme Name : M. Tech Engineering Design												
	Glob	al Nat	ional / Local	Regional / National								
Sr. No.	Graduate Attribute No.	Graduate Attributes	Programme Outcome No.	Programme Outcomes								
1	GA1	Scholarship: research, inquiry and lifelong learning	POI	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.								
2	GAI	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 Nation al							
4	GAI	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	P05	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.	Global							
6	GA2	Global citizenship: ethical, social and professional understanding	P06	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 Nation al							
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	P009	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.								
п	GAI	Scholarship: research, inquiry and lifelong learning	P011	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	GAI	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	PSOI	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	Institute Course Code	Catalog Course Code	Name of The Course	Course Outcome No.	Course Outcome Statement	PO1	PO2	P03	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011	PO12	PSOI	PSO2
	I (Full Time)	701500101	TE7919	Research Methodology & Techniques	COI	Upskill in understanding the fundamental concepts of research, including its types, processes, and criteria for good research.	Strong-H	Strong-H	-	÷	-	Weak-L	Weak-L	Weak-L	Weak-L	-	Moderate-M	Moderate-M	-	-
					C02	Reskill in conducting a literature review, identifying research gaps, and writing a review paper using bibliometric tools and software.	Moderate-M	Strong-H		Strong-H	Strong-H	Strong-H	Weak-L	Weak-L	-		-	Strong-H	-	
					C03	Develop and design a research problem and apply various research designs and methodologies.	Strong-H	Strong-H	Strong-H	-	Moderate-M	Moderate-M	Weak-L	Weak-L	-	Moderate-M	Moderate-M	Moderate-M		
					CO4	Analyze data using statistical methods, understand various probability distributions, and interpret statistical results.	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	Moderate-M	-	-	-	Moderate-M	Moderate-M	Moderate-M	-	
	I (Full Time)	701500102	TE7917	Quantitative Techniques	CO1	Apply linear algebra techniques, including solving systems of simultaneous equations, least squares method, iterative methods, and eigenvalues. Understand numerical methods for	Strong-H	Strong-H		Strong-H	Moderate-M		-	-	-	Moderate-M	Moderate-M	Moderate-M	-	
					C02	Utilize numerical methods for interpolation, extrapolation, and integration, including Newton- Cotes formula, Trapezoidal, Simpson's 1/3 and 3/8 rules, Gauss quadrature, and methods for	Strong-H	Strong-H		Strong-H	Strong-H	Moderate-M		-	-		Moderate-M	Moderate-M	-	•
					C03	Implement optimization methods to solve various problems, understand the significance of optimization, and apply time series analysis techniques, including semi-average, moving average,	Strong-H	Strong-H		Strong-H	Moderate-M	Moderate-M		-	-	Moderate-M	-	Moderate-M		•
					CO4	Use Mathematica software for solving complex quantitative problems and visualizing results.	Moderate-M	Moderate-M		Moderate-M	Strong-H	Strong-H		-	-		Moderate-M	Moderate-M		•
	I (Full Time)	701500201	TE7918	Research Ethics & Integrity	CO1	Understand the basic principles of philosophy and ethics, including moral judgments and their relevance to research.	Moderate-M	Moderate-M		Moderate-M		Strong-H		Strong-H		Weak-L		Strong-H		•
					C02	Analyze scientific misconduct, such as falsification, fabrication, and plagiarism (FFP), and apply methods to maintain research integrity and intellectual honesty.	Moderate-M	Strong-H	Moderate-M	Strong-H		Strong-H		Strong-H	-			Moderate-M		•
					C03	Develop skills to recognize and address publication ethics issues, including authorship, predatory journals, and best exercises in publishing.	Moderate-M	Strong-H	Strong-H	Strong-H		Strong-H		Moderate-M		Weak-L		Moderate-M		
					CO4	Evaluate the principles of open-access publishing, copyright, intellectual property rights, and their relevance to research.	Moderate-M	Strong-H	Strong-H	Strong-H	-			Moderate-M		Weak-L		Moderate-M		
					COS	Examine ethical issues in research involving human subjects, data management, and intellectual reverty, with case studies related to natents.	Moderate-M	Strong-H	Strong-H	Strong-H	-	Strong-H		Moderate-M		Weak-L		Moderate-M		
	I (Part Time)	701510101	TE7919	Research Methodology & Techniques	COI	Upskill in understanding the fundamental concepts of research, including its types, processes, and criteria for good research.	Strong-H	Strong-H		-		Weak-L	Weak-L	Weak-L	Weak-L		Moderate-M	Moderate-M	-	
					C02	Reskill in conducting a literature review, identifying research gaps, and writing a review paper using bibliometric tools and software.	Moderate-M	Strong-H		Strong-H	Strong-H	Strong-H	Weak-L	Weak-L	-		-	Strong-H	-	•
					C03	Develop and design a research problem and apply various research designs and methodologies.	Strong-H	Strong-H	Strong-H	-	Moderate-M	Moderate-M	Weak-L	Weak-L	-	Moderate-M	Moderate-M	Moderate-M		•
					CO4	Analyze data using statistical methods, understand various probability distributions, and interpret statistical results.	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	Moderate-M		-		Moderate-M	Moderate-M	Moderate-M		•
	I (Part Time)	701510102	TE7917	Quantitative Techniques	CO1	Apply linear algebra techniques, including solving systems of simultaneous equations, least squares method, iterative methods, and eigenvalues. Understand numerical methods for	Strong-H	Strong-H		Strong-H	Moderate-M			-		Moderate-M	Moderate-M	Moderate-M		•
					C02	Utilize numerical methods for interpolation, extrapolation, and integration, including Newton- Cotes formula, Trapezoidal, Simpson's 1/3 and 3/8 rules, Gauss quadrature, and methods for	Strong-H	Strong-H		Strong-H	Strong-H	Moderate-M			-		Moderate-M	Moderate-M		
					C03	Implement optimization methods to solve various problems, understand the significance of optimization, and apply time series analysis techniques, including semi-average, moving average,	Strong-H	Strong-H		Strong-H	Moderate-M	Moderate-M			-	Moderate-M		Moderate-M		
					CO4	Use Mathematica software for solving complex quantitative problems and visualizing results.	Moderate-M	Moderate-M		Moderate-M	Strong-H	Strong-H	-		-		Moderate-M	Moderate-M		· ·
	I (Part Time)	701510201	TE7918	Research Ethics & Integrity	CO1	Understand the basic principles of philosophy and ethics, including moral judgments and their relevance to research.	Moderate-M	Moderate-M		Moderate-M		Strong-H	-	Strong-H	-	Weak-L	-	Strong-H		
					C02	Analyze scientific misconduct, such as fakification, fabrication, and plagiarism (FFP), and apply methods to maintain research integrity and intellectual honesty.	Moderate-M	Strong-H	Moderate-M	Strong-H	-	Strong-H	-	Strong-H	-	-	-	Moderate-M	-	
					C03	Develop skills to recognize and address publication ethics issues, including authorship, predatory journals, and best practices in publishing.	Moderate-M	Strong-H	Strong-H	Strong-H		Strong-H	-	Moderate-M		Weak-L	-	Moderate-M		
					CO4	Evaluate the principles of open-access publishing, copyright, intellectual property rights, and their relevance to research.	Moderate-M	Strong-H	Strong-H	Strong-H	-			Moderate-M		Weak-L		Moderate-M		
					COS	Examine ethical issues in research involving human subjects, data management, and intellectual property, with case studies related to patents.	Moderate-M	Strong-H	Strong-H	Strong-H		Strong-H	-	Moderate-M		Weak-L	-	Moderate-M	-	