1.1.1 SIT_M Tech (AT)_2023-24_CO-PO Mapping

Academic Year : 2023-2024

Institute/ Branch Name : Symbiosis Institute of Technology Programme Name : Master of Technology (Automotive Technology)

Color Code Description:

Global	National / Local	Regional / National

Sr. No.	GA No.	Graduate Attributes	PO No.	Programme Outcomes	
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 analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	
3	GA1	Scholarship: research, inquiry and lifelong learning	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.	
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.	

5	GA2	Global citizenship: ethical, social and professional understanding	PO5	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.	
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.	
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	GA2	Global citizenship: ethical, social and professional understanding	PO9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	
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.	
12	GA1	Scholarship: research, inquiry and lifelong learning	PO12	Recognize the need for, and have the preparation and ability to engage in independent and life-long 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	PO13	Create creative, innovative and socially relevant systems which are using knowledge and application of mechanical engineering components	
14	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	PO14	Acquaint with the contemporary trends in industry and use knowledge of advance tools and techniques for research and development in cutting edge areas	

Sr. No.	Semester	Institute Course Code	Catalog Course Code	Title	Course Outcome No	Course Outcome Statement	PO01	PO02	PO03	PO04	PO05	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	I	701520105	TE7976	Automotive Engineering Systems	CO1	Understand Vehicles Drive Units, Transmissions, , Need of Gearboxes, Performance of Vehicle Transmissions, Transmission Design, Transmission Losses and Efficiency	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	Weak-L	-
					CO2	Discuss the Basic Design Principles of Gearbox, Manual Transmissions, Automated Transmissions Hybrid Drives. Final Drives, Differential and Transfer Gearboxes	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	Weak-L	-
					CO3	Understand the Automobile Body, Types of frame, use of Steel passenger vehicle. Vehicle layout, Different types of Car Body Style, Design of Automotive Beam Crashworthiness: Safety Test Requirements,	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	Weak-L	
					CO4	Understand the Brake & Suspension System, Testing of brakes, Construction of suspension system, , Roll Center stability Analysis.	Moderate-M		Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Weak-L	
					CO5	Developing a Traction Diagram and Engine Transmission	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	Weak-L	
2	I	701520125	TE7651	Power Electronics for Automobile Lab	CO1	Design of step-up chopper and step down chopper.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Three phase IGBT based PWM inverter control of induction motor.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Design of a driver circuit rectifier circuit using bread board.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Load test and Speed control on D.C shunt motor.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Load test on single-phase induction motor and three-phase induction motor.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
3	I	701520109	TEE7001	Modelling and Simulation of EHV	CO1	Understand the hardware and software platforms for distributed control systems	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Understand the CAD Modelling and FE analysis of EHV components	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Develop Models of EHV using Simulation software	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Tune PID controller for a mechanical application using distributed control systems	Moderate-M	-	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-
					CO5	Program car movements using microcontroller boards	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
4	I	701520106	TE7975	Power Electronics for Automobile	CO1	Understand the working principle of Semiconductor devices	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Describe the construction and operation of Converters.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Illustrate the construction and operation of Rectifiers and Inverters.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Explain the construction and working principle of various Electric motor types.	Moderate-M	-	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-
					CO5	Make use of power electronics components in hybrid electric vehicle and fuel cell vehicle.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
5	I	701520106	TE7975	Materials for Automobile	CO1	Select and examine the engineering alloys suitable for light weight andhigh-performance automotive application.	Strong - S	Strong - S	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Acquaint knowledge on classification- mechanical properties- processing of	Strong - S	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO3	Describe the different types of polymers. mechanical properties and its	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO4	Distinguish the relevant features between fiber-reinforced and particle reinforced	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO5	Recognize the need of light weight- smart and nano materials and describe its	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
6	I	701520110		Integrated Disaster Management	CO1	Distinguish between the different approaches needed to manage pre- during and	-	-	-	-	-	-	Modarate	weak	Modarate	weak	-	Strong	weak	strong
					CO2	Understand the process of risk / Emergency/Disaster Management Cycle	weak	-	-	-	-	-	Modarate	Modarate	Strong	weak	-	Modarate	weak	strong
					CO3	Affirm the usefulness of integrating management principles in disaster mitigation	-	-	-	-	-	-	-	weak	weak	weak	-	Strong	weak	strong
					CO4	Develop an understanding of the key concepts, definitions a key perspectives of	-	-	-	-	-	-	weak	weak	Strong	weak	-	Modarate	weak	strong
					CO5	Develop a basic under understanding of Prevention, Mitigation, Preparedness,	-	-	-	-	-	-	Modarate	weak	Modarate	weak	-	Modarate	weak	strong
7	I	701520124	TE7993	Plug-in Electric Vehicles in Smart Grid	CO1	Understand the Electric Vehicle concepts and its importance.	Strong - S	Strong - S	Nil	-	-	-	Moderat	-	-	-	-	-	Moderat	Moderat
					CO2	Analyse the influence of EVs on power system.	Strong - S	Strong - S	Moderate-M	-	-	-	Moderat	-	-	-	-	-	Moderat	Moderat
					CO3	Assess the role of Grid applications in EVs	Strong - S	Strong - S	Moderate-M	-	-	-	Moderat	-	-	-	-	-	Moderat	Moderat
					CO4	Understand ICT solutions to support EV deployment EVs	Strong - S	Strong - S	Nil	-	-	-	Moderat	-	-	-	-	-	Moderat	Moderat
					CO5	Investigate EV charging planning	Strong - S	Strong - S	Moderate-M	-	-	-	Moderat	-	-	-	-	-	Moderat	Moderat
8	I	701520101	TE7938	Applied Statistics and Numerical Methods	CO1	Use numerical methods to solve algebraic equations, transcendental equations,	Strong - S	Strong - S	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Apply interpolation formulae to predict the value of any intermediate term and	Strong - S	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO3	Determine numerical solutions of ordinary and partial differential equations	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO4	Calculate coefficient of correlation and estimate the value of dependent variable	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
					CO5	Compute probabilities using probability distributions discrete and continuous	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
9	I	701520103	TE7109	Research Methodology in engineering	CO1	Choose a proper scientific research methodology.	strong	Nil	Moderate	Weak	Nil	-	-	-	-	-	-	-	-	-
					CO2	Carry out a literature review as per the scientific methodology.	strong	Nil		Weak	Weak			Weak	-	-	-	-	-	-
					CO3	Make use of various statistical tools and analyze statistical data to interpret the resu	Moderate	strong	Moderate	Weak	Moderate				-	-	-	-	-	-
					CO4	Will be able to design proper experimentation methodology using design of experir	Moderate	strong	Moderate	Weak	Moderate				-	-	-	-	-	-
					CO5	Summarize the results of the research in a well-documented form.	strong	Nil	Weak	Weak	Weak			Weak	-	-	-	-	-	-
10	I	701520104	TE7659	Technical Communication Skills	CO1	Sketch their communicative knowledge for effective interpersonal, business,	Weak	Strong	-	-	Weak	-	-	-	-	-	-	-	-	-
					CO2	Demonstrate linguistic competence and employ communication etiquettes through	Moderate	Moderate	-	-	Weak	-	-	-	-	-	-	-	-	-
					CO3	Construct and draft effective Proposals, Manuals and research papers.	Moderate	Strong	-	-	Weak	-	-	-	-	-	-	-	-	-
					CO4	Constructing sentences effectively using grammar, punctuation and vocab with	Weak	Moderate	-	-	Weak	-	-	-	-	-	-	-	-	-
					CO5	Design impactful resumes, memos, reports, emails and business letters.	Moderate	Strong	-	-	Weak	-	-	-	-	-	-	-	-	-
					CO1	Students will be able to understand the basic principles of heating, ventilation, and	Strong - S	Strong - S	-	-	-	-	-	-	-	-	-	-	-	-

11	I	701520113	TE7979	Automotive HVAC	CO2	Students will be able to Identify the functions of HVAC components like	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Students will be able to diagonose common HVAC issues such as refrigerant	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Students will be able to learn how to properly maintain an HVAC system,	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
12	I	701520102	TE7939	Applied Statistics and Numerical Methods Lab	CO1	Use MATLAB software Built in functions to carry out matrix operations.	Strong - S	Strong - S		-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Solve algebraic and transcendental equations using MATLAB software for	Strong - S	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO3	Determine solution of system of simultaneous equations by Gauss Seidel method	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO4	Write MATLAB code to evaluate numerical interpolation and integration.	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO5	Find numerical solutions of ordinary differential equations using a computer	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO6	Use statistical analysis software to carry out statistical computations.	Strong - S	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
13	II	701520203	TE7997	Automotive AI	CO1	Understand the relation between system and signals,	Strong	Moderate	Strong	weak	weak	Strong	-	-	-	-	-	-	-	-	-
					CO2	Apply the knowledge of intelligence to automotive domain	Strong	Strong		Strong	Moderat	weak	-	-	-	-	-	-	-	-	-
					CO3	Explore various tools in the field of intelligence awareness	Strong	Strong	Moderate	Nil	Strong	weak	-	-	-	-	-	-	-	-	-
					CO4	Know enough on the neural network as applied for automotive application	Strong	Moderate	Strong	weak	Moderat	weak	-	-	-	-	-	-	-	-	-
					CO5	Learn different ways to extract and retrieve information from automobile	Strong	Moderate		Moderate	Strong	Nil	weak	-	-	-	-	-	-	-	-
14	II	701520205	TE7989	Vehicle Electronic Control Management System	CO1	Understand the basic components of automotive mechatronics and control	Strong	Moderate	Strong	weak	weak	Strong	Nil	-	-	-	-	-	-	-	-
					CO2	Understand the basics of sensors, actuators and its interaction with automotive	Strong	Strong		Strong	Moderat	weak	Moderat	-	-	-	-	-	-	-	-
					CO3	Understand the basics of electronic engine management system for SI and CI	Strong	Strong	Moderate	Nil	Strong	Strong	Moderat	-	-	-	-	-	-	-	-
					CO4	Identify the use of multiplex networking for automotive applications	Strong	Moderate	Strong	weak	Moderat	Moderat		-	-	-	-	-	-	-	-
					CO5	Identify the applications of automotive mechatronics in different sub-domains of	Strong	Moderate		Moderate	Strong		weak	-	-	-	-	-	-	-	-
15	II	701520207	TE7989	Electric and Hybrid Vehicles	CO1	To enable the students to understand electric vehicle concept.	Strong	Strong	Moderate		Strong	Strong	Moderat	-	-	-	-	-	-	-	-
					CO2	Introduce students to the fundamentals of hybrid electric vehicle.	Strong	Moderate	Strong	weak	Moderat	Moderat		-	-	-	-	-	-	-	-
					CO3	To introduce students electric and hybrid vehicle architecture & configuration.	Strong	Moderate	Nil	Moderate	Strong		weak	-	-	-	-	-	-	-	-
16	II	TE7999	TE7999	EV Noise Vibration and Harshness	CO1	Understand electrical motor noise behaviour.	strong	Moderate	Moderate	Weak	Moderate	Moderate	Moderate	-	-	-	-	-	-	-	-
					CO2	Understand electric power sources in the driveline and its NVH impact	strong	Moderate	Moderate	Moderate	Weak			-	-	-	-	-	-	-	-
					CO3	Understand Driveline NVH characteristics	strong	Moderate	Moderate	Moderate	Moderate			-	-	-	-	-	-	-	-
					CO4	Understand Electric vehicle Sound Quality	strong	strong	Moderate	Moderate	Moderate	Moderate	Moderate	-	-	-	-	-	-	-	-
17	II	701520202	TE7998	EV Noise Vibration and Harshness Lab	CO1	Demonstrate the significance of experimentation and explore the possibility of	strong	Strong	Strong	Strong	Moderate	Moderate	Moderate	-	-	-	-	-	-	-	-
					CO2	Acquire hands on experience on the various test-rigs, experimental set up for	strong	Strong	Strong	Strong	Weak			-	-	-	-	-	-	-	-
					CO3	Measure the various technical parameters by instrument and by mathematical	strong	Strong	Strong	Strong	Moderate			-	-	-	-	-	-	-	-
					CO4	Validate actual performance of the system experimentally in terms of Noise &	strong	strong	Strong	Strong	Moderate	Moderate	Moderate	-	-	-	-	-	-	-	-
18	II	701520208	TE7988	Automotive Electrical and Electronic Systems	CO1	Acquire the knowledge of operation of Sensors and actuators in an automobile	Strong - S	Strong - S	Moderate-M	-	Moderat	-	Moderat	-	Moderat	Moderat	Moderat	-	-	-
					CO2	Understand the various components, systems, and working of an Automotive	Strong - S	Strong - S	Moderate-M	-	Moderat	-	Moderat	-	Moderat	Moderat	Moderat	-	-	-
					CO3	Understand the process of air charging, fuel supply, strategy for combustion in an	Strong - S	Strong - S	Moderate-M	-	Moderat	-	Moderat	-	Moderat	Moderat	Moderat	-	-	-
					CO4	Students will have the capacity to understand and identify the different types of	Strong - S	Strong - S	Moderate-M	-	Moderat	-	Moderat	-	Moderat	Moderat	Moderat	-	-	-
					CO5	Students will be able to Identify the functions of different driver assist systems for control of the vehicle	Strong - S	Strong - S	Moderate-M	-	Moderat e-M	-	Moderat e-M	-	Moderat e-M	Moderat e-M	Moderat e-M	-	-	-
19	II	701520211	TE7986	Vehicle Dynamics and Control	CO1	To provide knowledge for understanding tyre dynamics.	Strong-S	Strong-S	Strong-S	Moderate-M	Weak-L	Moderat	Strong-S	-	-	Moderat	Weak-L	-	-	-
					CO2	To provide knowledge for understanding vehicle ride comfort.	Strong-S	Strong-S	Strong-S	Moderate-M	Weak-L	Moderat	Strong-S	-	-	Moderat	Weak-L	-	-	-
					CO3	To provide knowledge for understanding characteristic of vehicle performance.	Strong-S	Strong-S	Strong-S	Moderate-M	Weak-L	Moderat	Strong-S	-	-	Moderat	Weak-L	-	-	-
					CO4	To provide knowledge for understanding vehicle stability and handling.	Strong-S	Strong-S	Strong-S	Moderate-M	Weak-L	Moderat	Strong-S	-	-	Moderat	Weak-L	-	-	-
					CO5	To provide knowledge for understanding classic control theory and simulation	Strong-S	Strong-S	Strong-S	Moderate-M	Weak-L	Moderat	Strong-S	-	-	Moderat	Weak-L	-	-	-
20	II	701520206	TE7990	Testing and Certification of Automobile	CO1	Classify the vehicle and identify the regulations governing for each vehicle type	Strong - S	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
					CO2	Perform and analyze the Static & Dynamic test of any vehicle	Strong - S	Strong - S	Moderate-M	Moderate-M	Moderat	-	-	-	Moderat	-	-	-	-	-
					CO3	Perform various test related to vehicle engine emissions	Strong - S	Strong - S	Moderate-M	Moderate-M	Moderat	-	-	-	Moderat	-	-	-	-	-
					CO4	Test and analyze the performance of vehicle components	Strong - S	Strong - S	Moderate-M	Moderate-M	Moderat	-	-	-	Moderat	-	-	-	-	-
					CO5	Perform the tests to be done on the vehicle lighting system	Strong - S	Strong - S	Moderate-M	Moderate-M	Moderat	-	-	-	Moderat	-	-	-	-	-