

ACADEMIC CURRICULA
UNDERGRADUATE/ INTEGRATED
POST GRADUATE DEGREE
PROGRAMMES

(With exit option of Diploma)

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 1

(Revised on July 2024)



SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

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(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

7. B.Tech. in Automobile Engineering with Specialization in Vehicle Testing

7. (a) Mission of the Department

Mission Stmt – 1	To impart students with quality education centered on altering global requirements and add values to their career desires
Mission Stmt – 2	To enhance the knowledge and skill of students in collaboration with public and private sectors
Mission Stmt – 3	To identify and acknowledge economic, social and environmental issues that influences the quality of life in the vicinity and the globe
Mission Stmt – 4	To inculcate leadership qualities needed for automotive industries through robust curriculum with international outlook for sustainable future
Mission Stmt – 5	To build trust and co-operation at the workplace through effective inter-personal and communication skills

7. (b) Program Educational Objectives (PEO)

PEO – 1	To provide an overall knowledge about the application of electrical and electronics in automotive systems
PEO – 2	To make the students understand the use of sensors, actuators, signal conditioners, controls and software for automotive applications
PEO – 3	To understand the importance and procedure of fault diagnostics and data logging for automotive field.
PEO – 4	To expose the students to advanced requirements in industry like autonomous, inter and intra-vehicular communications protocols, hybrid vehicles technologies, model based system design and associated technologies
PEO – 5	To get exposure to the modern automobiles and contributing to the challenges of the society in terms of research and entrepreneurship.

7. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3	Mission Stmt. - 4	Mission Stmt. - 5
PEO - 1	3	3	2	2	3
PEO - 2	3	2	2	2	2
PEO - 3	3	3	1	2	1
PEO - 4	2	2	3	3	2
PEO - 5	3	2	3	3	2

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

7. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12	PSO-1	PSO-2	PSO-3
	Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning			
PEO - 1	3	1	2	2	3	1	1	2	2	3	1	3	3	2	3
PEO - 2	3	3	2	3	2	1	1	1	3	2	2	3	2	2	3
PEO - 3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3
PEO - 4	3	2	1	3	2	1	2	3	3	3	2	2	2	2	3
PEO - 5	3	2	2	2	2	3	3	3	3	2	2	2	2	2	2

3 – High Correlation, 2 – Medium Correlation, 1 – Low Correlation

PSO – Program Specific Outcomes (PSO)

PSO - 1	Students gain knowledge and expertise in the field of electrical and electronics related to automotive systems
PSO - 2	Ability to understand recent technological developments in Automotive electronics and develop products to cater the societal and industrial needs
PSO - 3	Assess society needs and develop constructive and creative solutions for problems related to Vehicle Testing.

7.(e) Program Structure: B.Tech. in Automobile Engineering with Specialization in Vehicle Testing

Humanities & Social Sciences including Management Courses (H)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21LEH101T	Communicative English	2	1	0	3	
21LEH102T	Chinese	2	1	0	3	
21LEH103T	French					
21LEH104T	German					
21LEH105T	Japanese					
21LEH106T	Korean					
21LEH107T	Spanish					
21LEH108T	Russian					
21GNH101J	Philosophy of Engineering	1	0	2	2	
21PDH209T ¹	Social Engineering	2	0	0	2	
21GNH401T	Behavioral Psychology	2	1	0	3	
Total Credits 13						

Basic Science Courses (B)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5	
21CYB101J	Chemistry	3	1	2	5	
21MAB101T	Calculus and Linear Algebra	3	1	0	4	
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4	
21MAB202T	Numerical Methods	3	1	0	4	
21BTB103T	Biology	2	0	0	2	
21MAB301T	Probability and Statistics	3	1	0	4	
Total Credits 32						

Engineering Science Courses (S)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21MES101L ¹	Basic civil and Mechanical Workshop	0	0	4	2	
21MES102L ¹	Engineering Graphics and Design	0	0	4	2	
21EES101T	Electrical and Electronics Engineering	3	1	0	4	
21CSS101J	Programming for Problem Solving	3	0	2	4	
21AUS101L ¹	Artifact Dissection Lab	0	0	2	1	
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3	
21MES101T	Engineering Mechanics	3	1	0	4	
21CSS303T	Data Science	2	0	0	2	
Total Credits 22						

Professional Core Courses (C)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21AUC201T ²	Applied Thermal Engineering	3	0	0	3	
21CSC206T	Artificial Intelligence	2	1	0	3	
21AUC202J	Automotive Engines	2	0	2	3	
21AUC203J	Manufacturing Technology for Automotive Engineers	2	0	2	3	
21MEC202T ²	Mechanics of Solids	3	1	0	4	
21MEC203T	Engineering Materials and Metallurgy	3	0	0	3	
21MEC202L ¹	Material testing Laboratory	0	0	2	1	
21MEC204L ¹	Fluid Dynamics Laboratory	0	0	2	1	
21MEC205T ²	Fluid Mechanics and Machinery	3	0	0	3	
21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3	
21AUC301T ²	CAD Analysis for Automotive Engineers	3	0	0	3	
21AUC302J	Vehicular Structures and Driveline Systems	2	0	2	3	
21AUC301L ¹	Design of Automotive Systems Laboratory	0	0	2	1	
21AUC303J	Automotive Electrical and Electronic Systems	2	0	2	3	
21AUC304J	Finite Element Analysis	3	0	2	4	
Total Credits 41						

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21GNP301L ¹	Community Connect	0	0	2	1	
21AUP302L ¹	Project	0	0	6	3	
21AUP303T ¹	MOOC	3	0	0		
21AUP401L	Major Project	0	0	30		15
21AUP402L	Major Project	0	0	20	10	
21AUP403L	Internship#	0	0	10	5	
Total Credits 19						

Non Credit Courses (M)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21PDM101L ¹	Professional Skills and Practices	0	0	2	0	
21PDM102L ¹	General Aptitude	0	0	2		
21PDM201L ¹	Verbal Reasoning	0	0	2		
21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2		
21PDM301L ¹	Analytical and Logical Thinking Skills	0	0	2		
21PDM302L ¹	Employability Skills and Practices	0	0	2		
21CYM101T ¹	Environmental Science	1	0	0		0
21LEM101T ¹	Constitution of India	1	0	0		0
21LEM102T ¹	Universal Human Values – Introduction	1	0	0		0
21LEM201T ¹	Professional Ethics	1	0	0		0
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3	
21LEM301T ¹	Indian Art Form	1	0	0	0	
21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0	
21GNM101L ¹	Physical and Mental Health using Yoga	0	0	2	0	
21GNM102L ¹	National Service Scheme					
21GNM103L ¹	National Cadet Corps					
21GNM104L ¹	National Sports Organization					
Total Credits 03						

Open Elective Courses (O) (Any 3 Courses)						
Course Code	Course Title	Hours / Week				
		L	T	P	C	
21AUO101T	Hybrid and Electric Vehicles	3	0	0	3	
21AUO102T	Renewable Sources of Energy	3	0	0	3	
21AUO103T	Special Type of Vehicles	3	0	0	3	
21AUO104T	Fuel Cells and Applications	3	0	0	3	
21AUO105T	Transport Management	3	0	0	3	
21AUO106T	Composite Materials for Automotive Applications	3	0	0	3	
21AUO107T	Non-Destructive Testing and Evaluation	3	0	0	3	
21AUO108T	Advanced Engine Technology	3	0	0	3	
21AUO109T	New Product Development	3	0	0	3	
21AUO110T	Automotive Standards and Regulations	3	0	0	3	
21AUO111T	Automotive Sciences	3	0	0	3	
21AUO112T	Intelligent Vehicle Technology	3	0	0	3	
Total Credits 09						

Professional Elective Courses (E) (Any 8 Courses)							
Course Code	Course Title	Hours / Week			C		
		L	T	P			
Sub-stream: Manufacturing							
21AUE221T	Automotive Components Manufacturing	3	0	0	3		
21AUE222T	Welding and Joining Techniques	3	0	0	3		
21AUE321T	Automotive Surface Engineering	3	0	0	3		
21AUE322T	Agile Manufacturing	3	0	0	3		
21AUE323T	Manufacturing Systems and Simulation	3	0	0	3		
21AUE324T	Advanced Manufacturing Process	3	0	0	3		
21AUE325T	Computer Integrated Manufacturing	3	0	0	3		
21AUE326T	Process Planning and Cost Estimation	3	0	0	3		
21AUE421T	Automotive Quality Systems	3	0	0	3		
21AUE422T	Industrial Engineering and Operational Research	3	0	0	3		
Sub-stream: Engine							
21AUE231T	Heat Ventilation and Air Conditioning	3	0	0	3		
21AUE232T	Engine Testing and Validation	3	0	0	3		
21AUE331T	Fuel Testing and Standards	3	0	0	3		
21AUE332T	Automotive Exhaust System Development	3	0	0	3		
21AUE333T	Engine Auxiliary Systems	3	0	0	3		
21AUE334T	Design of Automotive Thermal System	3	0	0	3		
21AUE335T	Simulation of Internal Combustion Engines	3	0	0	3		
21AUE431T	Automotive Emission Formation and Controls	3	0	0	3		
21AUE432T	Alternative Fuels and Energy Systems	3	0	0	3		
Sub-stream: Design							
21AUE241T	Automotive Driveline Design	3	0	0	3		
21AUE242T	Automotive Chassis Component Design	3	0	0	3		
21AUE341T	Vehicle Design Data Characteristics	3	0	0	3		
21AUE342T	Concepts of Engineering Design	3	0	0	3		
21AUE343T	Rapid Prototyping and Tooling	3	0	0	3		
21AUE344T	Modeling and Control of Vibration in Mechanical Systems	3	0	0	3		
21AUE441T	Design for Manufacture	3	0	0	3		
21AUE442T	Geometrical Dimensioning and Tolerance	3	0	0	3		

Professional Elective Courses (E)							
Course Code	Course Title	Hours / Week			C		
		L	T	P			
Sub-stream: Vehicular Technologies							
21AUE251T	Auxiliary Vehicle Systems	3	0	0	3		
21AUE252T	Two and Three Wheeler Technology	3	0	0	3		
21AUE351T	Vehicle Performance and Testing	3	0	0	3		
21AUE352T	Tyre Technology	3	0	0	3		
21AUE353T	Motorsport Technology	3	0	0	3		
21AUE354T	Automotive NVH	3	0	0	3		
21AUE355T	Advanced Vehicle Technology	3	0	0	3		
21AUE451T	Automotive Safety and Ergonomics	3	0	0	3		
21AUE452T	Vehicle Body Engineering and Aerodynamics	3	0	0	3		
Sub-stream: Vehicle Testing							
21AUE361T	Electromagnetic Interference and Compatibility	3	0	0	3		
21AUE362T	Vehicle Crashworthiness and Occupants Safety	3	0	0	3		
21AUE461T	Automotive Component Testing and Certification	3	0	0	3		
21AUE462T	Vehicular Vibration and Vehicle Dynamics	3	0	0	3		
21AUE463T	Advanced Power Train Technology	3	0	0	3		
21AUE464T	Electric Vehicle Technology and Testing	3	0	0	3		
Total Credits						24	

Course Code	Course Name	Program Outcomes (PO)												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
		Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern Tool Usage	The engineer and society	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2	PSO-3
21AUE361T	Electromagnetic Interference and Compatibility	2.4	1.2	3	1.4	0.6								1.8	0.6	0.6
21AUE362T	Vehicle Crashworthiness and Occupants Safety	2.4	1.2	3										2.8	0.6	0.2
21AUE461T	Automotive Component Testing and Certification	2.4	1.8	3	0.8	0.6								2.4	0.4	0.8
21AUE462T	Vehicular Vibration and Vehicle Dynamics	2.4	1.8	3	0.8	0.6								3	0.4	0.8
21AUE463T	Advanced Power Train Technology	2.4	1.8	3	0.8	0.6								3		
21AUE464T	Electric Vehicle Technology and Testing	2.4	1.8	3	0.8	0.6								3	1.4	
Program Average		2.4	1.6	1.3	1.1	0.6	0.2	0.4	0.2	0.2	0.2	0.2	0.3	2.6	0.8	0.3



7. (f) Implementation Plan: B.Tech. in Automobile Engineering with Specialization in Vehicle Testing

Semester – I							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21LEH101T	Communicative English	2	1	0	3		
21MAB101T	Calculus and Linear Algebra	3	1	0	4		
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5		
21MES102L ¹	Engineering Graphics and Design	0	0	4	2		
21EES101T	Electrical and Electronics Engineering	3	1	0	4		
21AUS101L ¹	Artifact Dissection Lab	0	0	2	1		
21CYM101T ¹	Environmental Science*	1	0	0	0		
21PDM101L ¹	Professional Skills and Practices	0	0	2	0		
21LEM101T ¹	Constitution of India	1	0	0	0		
Total Credits					19		
Semester – II							
Course Code	Course Title	Hour / Week					
		L	T	P	C		
21LEH102T	Chinese						
21LEH103T	French						
21LEH104T	German						
21LEH105T	Japanese	2	1	0	3		
21LEH106T	Korean						
21LEH107T	Spanish						
21LEH108T	Russian						
21GNH101J	Philosophy of Engineering	1	0	2	2		
21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4		
21CYB101J	Chemistry	3	1	2	5		
21BTB103T	Biology	2	0	0	2		
21CSS101J	Programming for Problem Solving	3	0	2	4		
21MES101T	Engineering Mechanics	3	1	0	4		
21MES101L ¹	Basic Civil and Mechanical Workshop	0	0	4	2		
21PDM102L ¹	General Aptitude*	0	0	2	0		
21GNM101L ¹	Physical and Mental Health using Yoga						
21GNM102L ¹	National Service Scheme	0	0	2	0		
21GNM103L ¹	National Cadet Corps						
21GNM104L ¹	National Sports Organization						
Total Credits					26		
Semester – III							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4		
21MEC202T ²	Mechanics of Solids	3	1	0	4		
21MEC203T	Engineering Materials and Metallurgy	3	0	0	3		
21AUC201T ²	Applied Thermal Engineering	3	0	0	3		
21AUC203J	Manufacturing Technology for Automotive Engineers	2	0	2	3		
21PDH209T ¹	Social Engineering	2	0	0	2		
21LEM201T ¹	Professional Ethics*	1	0	0	0		
21PDM201L ¹	Verbal Reasoning*	0	0	2	0		
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3		
21MEC202L ¹	Material testing Laboratory	0	0	2	1		
Total Credits					23		
Semester – IV							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21MAB202T	Numerical Methods	3	1	0	4		
21CSC206T	Artificial Intelligence	2	1	0	3		
21MEC205T ²	Fluid Mechanics and Machinery	3	0	0	3		
21AUC202J	Automotive Engines	2	0	2	3		
E	Professional Elective – I				3		
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3		
21PDM202L ¹	Critical and Creative Thinking Skills*	0	0	2	0		
21MEC204L ¹	Fluid Dynamics Laboratory	0	0	2	1		
Total Credits					20		
Semester – V							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21MAB301T	Probability and Statistics	3	1	0	4		
21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3		
21AUC301T ²	CAD Analysis for Automotive Engineers	3	0	0	3		
21AUC302J	Vehicular Structures and Driveline Systems	2	0	2	3		
E	Professional Elective – II				3		
O	Open Elective – I	3	0	0	3		
21PDM301L ¹	Analytical and Logical Thinking Skills*	0	0	2	0		
21LEM301T ¹	Indian Art Form	1	0	0	0		
21AUC301L ¹	Design of Automotive Systems Laboratory	0	0	2	1		
21GNP301L ¹	Community Connect	0	0	2	1		
Total Credits					21		
Semester – VI							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21CSS303T	Data Science	2	0	0	2		
21AUC303J	Automotive Electrical and Electronic Systems	2	0	2	3		
21AUC304J	Finite Element Analysis	3	0	2	4		
E	Professional Elective – III	3	0	0	3		
E	Professional Elective – IV	3	0	0	3		
21AUP302L ¹	Project	0	0	6	3		
21AUP303T ¹	MOOC	3	0	0	3		
O	Open Elective – II	3	0	0	3		
21PDM302L ¹	Employability Skills and Practices	0	0	2	0		
21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0		
Total Credits					21		
Semester – VII							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21GNH401T	Behavioral Psychology	2	1	0	3		
E	Professional Elective – V	3	0	0	3		
E	Professional Elective – VI	3	0	0	3		
E	Professional Elective – VII	3	0	0	3		
E	Professional Elective – VIII	3	0	0	3		
O	Open Elective – III	3	0	0	3		
Total Credits					18		
Semester – VIII							
Course Code	Course Title	Hours / Week					
		L	T	P	C		
21AUP401L	Major Project	0	0	30	15		
21AUP402L	Major Project	0	0	20	10		
21AUP403L	Internship#	0	0	10	5		
Total Credits					15		

#Students have to register either 21AUP401L or 21AUP402L and 21AUP403L both in eighth semester



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