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 AND TECHNOLOGY

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

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

5. B.Tech. in Automobile Engineering with Specialization in Automotive Electronics

5. (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*

5. (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.*

5. (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

5. (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			
	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
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 Automotive Electronics*

5. (e) Program Structure: B.Tech. in Automobile Engineering with Specialization in Automotive Electronics

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
21CSC206T	Artificial Intelligence	2	1	0	3
21AUC201T [2]	Applied Thermal Engineering	3	0	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
21AUC305J	Automotive Microcontrollers	3	0	2	4
21AUC401J	Vehicle Dynamics	2	0	2	3
21AUC403J	Automotive Fault Diagnostics	2	0	2	3
	Total Credits				**47**

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**

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**

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**

Professional Elective Courses (E) *(Any 6 Courses)*					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21AUE202T	*Sensors Actuators and Signal Conditioners*	*3*	*0*	*0*	*3*
21AUE211J	*Analog and Digital circuits for Automotive Applications*	*2*	*0*	*2*	*3*
21AUE311T	*Principles of Linear Systems and Signals*	*3*	*0*	*0*	*3*
21AUE312T	*Automotive Infotronics*	*3*	*0*	*0*	*3*
21AUE313T	*Artificial Neural Networks and Fuzzy Logic*	*3*	*0*	*0*	*3*
21AUE314T	*CAD and Simulation for Electronics*	*3*	*0*	*0*	*3*
21AUE317J	*Automotive Control Engineering*	*2*	*0*	*2*	*3*

Professional Elective Courses (E)					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21AUE411T	*Power Electronics for Electric Vehicle Application*	*3*	*0*	*0*	*3*
21AUE412T	*State Space Analysis and Digital Control System*	*3*	*0*	*0*	*3*
21AUE413T	*Model Based System Design*	*3*	*0*	*0*	*3*
21AUE414J	*Modelling and Control of Electric and Hybrid Vehicles*	*2*	*0*	*2*	*3*
21AUE415T	*Vehicle Stability and Control Systems*	*3*	*0*	*0*	*3*
21AUE416T	*Electronic Engine Management System*	*3*	*0*	*0*	*3*
				Total Credits	**18**

5. (f) Programme Articulation: B.Tech. in Automobile Engineering with Specialization in Automotive Electronics

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
21AUS11L	Artifact Dissection Lab	3	3										3	2	1	1
21AUC21T	Applied Thermal Engineering	1.2	1.6	0.6				0.4						1.6	1.2	0.6
21AUC22J	Manufacturing Technology for Automotive Engineers	3	3					0.8						3	3	
21AUC23J	Automotive Engines	1.6	0.6	0.2	0.8	0.6		0.8						1.6	0.6	0.2
21AUC31T	CAD Analysis for Automotive Engineers	3	1	2	1	1.8								3	0.6	
21AUC31L	Design of Automotive Systems laboratory	2.6	1.8	2.6	2.4	1.8								2.6	1.8	2.6
21AUC32J	Vehicular Structures and Driveline Systems	3		0.8	0.6			0.4						3		
21AUC33J	Automotive Electrical and Electronics	3	3	1	1	1.8				1	1		1	3	3	1
21AUC41J	Vehicle Dynamics	3	3			3								3	2	
21AUC35J	Automotive Micro controllers	3	2.2	0.8	1.2	1.6				1	1		2	2.4	1.2	
21AUC43J	Automotive Fault Diagnosis	3	2	1	1	3							1.2	1.8		
21AUE22T	Sensors Actuators and Signal conditioners	3	3	1.8		1.8							1	2.8	0.2	
21AUE211J	Analog and Digital circuits for Automotive Applications	3	2.6	1		2				1	1		1	2.4	0.4	
21AUE311T	Principles of Linear Systems and Signals	3	3											3		
21AUE312T	Automotive Infotronics	3	2.8			1.8								2.4	0.4	0.4
21AUE313T	Artificial Neural Networks and Fuzzy Logic	3	3											3		
21AUE314T	CAD and Simulation for Electronics	3		2.2										1.2	1.6	
21AUE317J	Automotive control engineering	3	2	2.6										3		
21AUE411T	Power Electronics for Electric Vehicle Application	3	1.8	1.6	0.8									3		2
21AUE412T	State Space Analysis and Digital Control System	3	3	2	2								1	3	1	
21AUE413T	Model Based System Design	3	2.8			1.8								0.6	2.8	0.6
21AUE414J	Modelling and Control of Electric and Hybrid Vehicles	3	2.6	2.6		1.4								3		
21AUE415T	Vehicle Stability and Control Systems	3	3											1.2	1.8	
21AUE416T	Electronic Engine Management System	3	1.2	2		1							1.4	3		
21AUP302T	MOOC	3	2	2							2		2			
21AUP303L	Project	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3
21AUP401L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21AUP402L	Major Project	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21AUP403L	Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Program Average	2.9	2.3	1.3	0.7	1.2	0.3	0.4	0.3	0.4	0.5	0.3	0.8	2.4	1.2	0.6

5. (g) Implementation Plan: B.Tech. in Automobile Engineering with Specialization in Automotive Electronics

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	Hours / Week L	T	P	C
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
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	0	0	2	0
21GNM102L [1]	National Service Scheme				
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
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
21AUC305J	Automotive Microcontrollers	3	0	2	4
E	Professional Elective – III				3
E	Professional Elective – IV				3
21AUP302L [1]	Project	0	0	6	3
21AUP303T [1]	MOOC	3	0	0	
O	Open Elective – II				3
21PDM302L [1]	Employability Skills and Practices	0	0	2	0
21LEM302T [1]	Indian Traditional Knowledge	1	0	0	0
				Total Credits	21

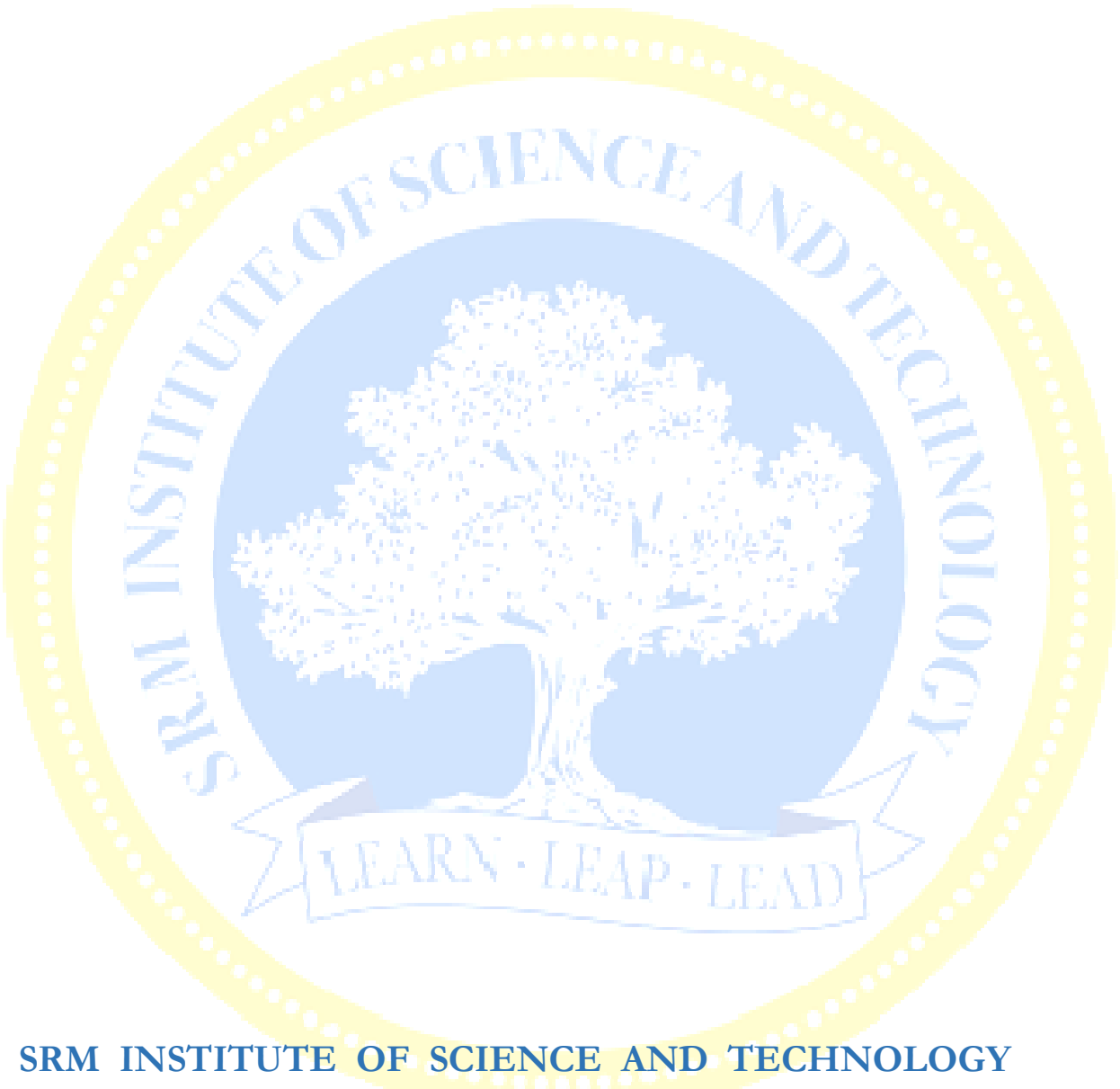
Semester – VII

Course Code	Course Title	Hours / Week L	T	P	C
21GNH401T	Behavioral Psychology	2	1	0	3
21AUC401J	Vehicle Dynamics	2	0	2	3
21AUC403J	Automotive Fault Diagnostics	2	0	2	3
E	Professional Elective – V				3
E	Professional Elective – VI				3
O	Open Elective – III				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



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India