ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMMES

Bachelor of Technology

(B.Tech. - Four Years)

(Choice Based Flexible Credit System)

Regulations 2018

Volume - 1

(Revised in March 2019)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Kancheepuram District 603203, Tamil Nadu, India

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

3. (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*

3. (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.*

3. (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	*H*	*H*	*M*	*M*	*H*
PEO - 2	*H*	*M*	*M*	*M*	*M*
PEO - 3	*H*	*H*	*L*	*M*	*L*
PEO - 4	*H*	*M*	*H*	*H*	*M*
PEO - 5	*H*	*M*	*H*	*H*	*M*

H – High Correlation, M – Medium Correlation, L – Low Correlation

3. (d) Mapping Program Educational Objectives (PEO) to Program Learning Outcomes(PLO)

	Program Learning Outcomes (PLO)														
	Graduate Attributes (GA)												Program Specific Outcomes (PSO)		
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
PEO - 1	*H*	*L*	*M*	*M*	*H*	*L*	*L*	*M*	*M*	*H*	*L*	*H*	*H*	*M*	*H*
PEO - 2	*H*	*H*	*M*	*H*	*M*	*L*	*L*	*L*	*H*	*M*	*M*	*H*	*M*	*M*	*H*
PEO - 3	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*M*	*M*	*H*	*H*	*H*	*H*
PEO - 4	*L*	*M*	*L*	*L*	*M*	*L*	*M*	*H*	*H*	*H*	*M*	*M*	*M*	*M*	*L*
PEO - 5	*M*	*M*	*M*	*M*	*M*	*H*	*M*	*H*	*H*	*M*	*M*	*M*	*M*	*M*	*M*

H – High Correlation, M – Medium Correlation, L – Low Correlation , PSO – Program Specific Outcomes (PSO)

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*

3. (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
18LEH101J	English	2	0	2	3
18LEH102J	Chinese	2	0	2	3
18LEH103J	French				
18LEH104J	German				
18LEH105J	Japanese				
18LEH106J	Korean				
18PDH101T	General Aptitude	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDH103T	Social Engineering	2	0	0	2
18PDH201T	Employability Skills & Practices	0	0	2	1
Total Learning Credits					**12**

Engineering Science Courses (S)

Course Code	Course Title	Hours/ Week L	T	P	C
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18CSS101J	Programming for Problem Solving	3	0	4	5
18AUS101L	Artifact Dissection Laboratory	0	0	2	1
18MES201T	Engineering Mechanics	3	1	0	4
Total Learning Credits					**21**

Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)

Course Code	Course Title	Hours/ Week L	T	P	C
18AUP101L	Massive Open Online Course - I	0	0	2	1
18AUP102L	Industrial Training-I				
18AUP103L	Seminar - I				
18AUP104L	Massive Open Online Course - II	0	0	2	1
18AUP105L	Industrial Training-II				
18AUP106L	Seminar - II				
18AUP107L	Minor Project	0	0	6	3
18AUP108L	Internship (4-6 weeks)				
18AUP109L	Project	0	0	20	10
18AUP110L	Semester Internship				
Total Learning Credits					**15**

Open Elective Courses *(Any 3 Courses)*

Course Code	Course Title	Hours/ Week L	T	P	C
18AUO101T	Hybrid and Electric Vehicles	3	0	0	3
18AUO102T	Renewable Sources of Energy	3	0	0	3
18AUO103T	Special Type of Vehicles	3	0	0	3
18AUO104T	Fuel Cells and Applications	3	0	0	3
18AUO105T	Transport Management	3	0	0	3
18AUO106T	Composite Material for Automobile Applications	3	0	0	3
18AUO107T	Non Destructive Testing and evaluation	3	0	0	3
18AUO108T	Advanced engine technology	3	0	0	3
18AUO109T	New Product Development	3	0	0	3
18AUO110T	Automotive standards and regulations	3	0	0	3
18AUO111T	Automotive Sciences	3	0	0	3
18AUO112T	Intelligent Vehicle Technology	3	0	0	3
Total Learning Credits					**9**

Basic Science Courses (B)

Course Code	Course Title	Hours/ Week L	T	P	C
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18CYB101J	Chemistry	3	1	2	5
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
Total Learning Credits					**28**

Professional Core Courses (C)

Course Code	Course Title	Hours/ Week L	T	P	C
15MEC101T	Thermodynamics	3	1	0	4
18AUC201J	Manufacturing Technology for Automotive Engineers	3	0	2	4
18AUC204L	Automotive Components and Assembly drawing	0	0	4	2
18MEC106T	Mechanics of Solids	3	1	0	4
18AUC203T	Applied Thermal Engineering for Automotive Engineers	3	1	0	4
18MEC102T	Fluid Mechanics	3	1	0	4
18MEC109L	Strength of Materials Laboratory	0	0	2	1
18MEC104T	Fluid Dynamics Laboratory	0	0	2	1
18AUC301J	Automotive Engines	3	0	2	4
18MEC108T	Materials Technology	3	0	0	3
18MEC201T	Machines and Mechanisms	3	1	0	4
18AUC302J	Vehicular Structures and Driveline Systems	3	0	2	4
18MEC111L	Materials Technology Laboratory	0	0	2	1
18AUC303J	Automotive Electrical and Electronic Systems	3	0	2	4
18AUC304J	CAD Analysis for Automotive Engineers	3	0	2	4
18AUC305T	Design of Automotive Components	3	0	0	3
18AUC401J	Vehicle Dynamics	3	0	2	4
18AUC402L	Vehicle Testing Laboratory	0	0	2	1
18AUC350T	Comprehension	0	1	0	1
Total Learning Credits					**57**

Mandatory Courses (M)

Code	Course Title	L	T	P	C
18PDM101L	Professional Skills and Practices	0	0	2	0
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM101T	Constitution of India	1	0	0	0
18LEM102J	Value Education	1	0	1	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
18LEM109T	Indian Traditional Knowledge	1	0	0	0
18LEM110L	Indian Art Form	0	0	2	0
18CYM101T	Environmental Science	1	0	0	0

Professional Elective Courses (E) (Any 6 Courses)					
Course Code	Course Title	Hours/ Week L	T	P	C
18AUE202T	Sensors, Actuators and Signal Conditioners	3	0	0	3
18AUE211J	Analog and Digital circuits for Automotive Applications	2	0	2	3
18AUE311T	Principles of Linear Systems and Signals	3	0	0	3
18AUE312T	Automotive Infotronics	3	0	0	3
18AUE313T	Artificial Neural Networks and Fuzzy Logic	3	0	0	3
18AUE314T	CAD and Simulation for Electronics	3	0	0	3
18AUE316J	Automotive Microcontrollers	2	0	2	3
18AUE317J	Automotive control engineering	2	0	2	3

Professional Elective Courses (E) (Any 6 Courses)					
Course Code	Course Title	Hours/ Week L	T	P	C
18AUE411T	Power Electronics for Electric Vehicle Application	3	0	0	3
18AUE412T	State Space Analysis and Digital Control System	3	0	0	3
18AUE413T	Model Based System Design	3	0	0	3
18AUE414J	Modelling and Control of Electric and Hybrid Vehicles	2	0	2	3
18AUE415T	Vehicle Stability and Control Systems	3	0	0	3
18AUE416T	Automotive Fault Diagnostics	3	0	0	3
18AUE417T	Electronic Engine Management System	3	0	0	3
18AUE455T	Machine Learning Approach for Automotive Applications	3	0	0	3

3. (f) Program Articulation: B.Tech. in Automobile Engineering with Specialization in Automotive Electronics

Course Code	Course Name	Program Learning Outcomes (PLO)														
		Graduate Attributes												PSO		
		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
18AUS101L	Artifact Dissection Laboratory	H	M	L	H	H	L	M	M	H	M	L	H	H	M	H
18AUC201J	Manufacturing Technology for Automotive Engineers	H	M	M	M	H	L	M	M	H	M	M	H	H	H	H
18AUC203T	Applied Thermal Engineering for Automotive Engineers	H	M	L	L	M	L	M	M	H	H	M	H	H	H	H
18AUC204L	Automotive Components and Assembly drawing	H	L	H	L	M	L	L	M	H	H	L	H	H	H	H
18AUC301J	Automotive Engines	H	H	M	M	M	L	M	L	M	H	L	H	H	H	H
18AUC302J	Vehicular Structures and Driveline Systems	H	H	M	M	M	L	M	L	M	H	L	H	H	H	H
18AUC303J	Automotive Electrical and Electronic Systems	H	H	M	M	M	L	M	M	H	M	M	H	H	H	H
18AUC304J	CAD Analysis for Automotive Engineers	H	H	H	H	L	L	L	L	M	H	L	M	H	H	M
18AUC305T	Design of Automotive Components	H	H	H	H	M	L	L	L	M	M	L	M	H	H	M
18AUC401J	Vehicle Dynamics	H	H	H	H	H	M	M	M	H	M	M	M	H	H	H
18AUC402L	Vehicle Testing Laboratory	H	H	H	H	H	M	M	M	H	M	M	H	H	H	H
18AUE202T	Sensors, Actuators and Signal Conditioners	H	H	H	H	M	L	L	M	H	M	M	H	H	M	M
18AUE211J	Analog and Digital circuits for Automotive Applications	H	H	H	H	M	L	L	M	H	M	M	H	H	M	M
18AUE311T	Principles of Linear Systems and Signals	H	H	M	H	M	L	M	M	M	M	M	H	H	M	H
18AUE312T	Automotive Infotronics	H	H	M	M	H	H	H	M	M	M	M	M	H	M	H
18AUE313T	Artificial Neural Networks And Fuzzy Logic	H	H	H	H	H	H	M	M	M	M	M	H	M	M	M
18AUE314T	CAD and Simulation for Electronics	H	H	H	H	H	H	H	M	H	M	H	M	H	H	M
18AUE316J	Automotive Microcontrollers	H	H	H	H	H	M	M	M	H	H	M	H	H	H	H
18AUE317J	Automotive control engineering	H	H	M	H	H	H	H	M	H	M	M	H	H	H	H
18AUE411T	Power Electronics for Electric Vehicle Application	H	H	M	H	H	H	H	M	H	M	M	H	H	H	H
18AUE412T	State Space Analysis And Digital Control System	H	H	H	H	H	H	H	H	H	M	L	H	H	H	H
18AUE413T	Model Based System Design	H	H	H	H	H	H	H	H	H	M	L	H	H	H	H
18AUE414J	Modelling and Control of Electric and Hybrid Vehicles	H	H	H	H	H	H	H	H	H	H	M	M	H	H	H
18AUE415T	Vehicle Stability and Control Systems	H	H	M	H	H	H	H	M	H	M	M	H	H	H	H
18AUE416T	Automotive Fault Diagnostics	H	H	M	H	H	H	H	M	H	M	M	H	H	H	H
18AUE417T	Electronic Engine Management System	H	H	H	H	H	H	H	M	H	M	M	H	H	H	H
18AUE455T	Machine Learning Approach for Automotive Applications	H	H	H	H	M	H	H	M	M	M	M	H	H	H	H
18AUO101T	Hybrid and Electric Vehicles	H	H	H	H	M	M	M	M	M	M	L	M	H	M	H
18AUO102T	Renewable Sources of Energy	H	M	H	H	M	L	H	M	M	M	L	H	H	H	M
18AUO103T	Special Type of Vehicles	H	H	H	H	M	M	M	M	M	M	L	M	H	M	H
18AUO104T	Fuel Cells and Applications	H	M	H	H	M	L	H	M	M	M	L	H	H	H	M
18AUO105T	Transport Management	H	H	H	H	M	M	M	M	M	M	L	M	H	M	H
18AUO106T	Composite Materials for Automotive Applications	H	M	H	H	M	L	H	M	M	M	L	H	H	H	M
18AUO107T	Non Destructive Testing and evaluation	H	H	H	H	M	M	M	M	M	M	L	M	H	M	H
18AUO108T	Advanced engine technology	H	M	H	H	M	L	H	M	M	M	L	H	H	H	M
18AUO109T	New Product Development	H	H	H	H	M	M	M	M	M	M	L	M	H	M	H
18AUO110T	Automotive standards and regulations	H	H	H	H	H	M	H	M	H	M	M	H	H	M	H
18AUO111T	Automotive Sciences	H	H	H	H	H	M	H	M	H	M	M	H	H	M	H
18AUO112T	Intelligent Vehicle Technology	H	L	L	L	H	H	H	H	M	M	M	M	M	M	M
18AUP101L	Massive Open Online Course - I	H	M	M	M	M	M	M	M	H	H	M	H	H	H	H
18AUP102L	Industrial Training-I	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18AUP103L	Seminar - I	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
18AUP104L	Massive Open Online Course - II	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18AUP105L	Industrial Training-II	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
18AUP106L	Seminar - II	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
18AUP107L	Minor Project	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18AUP108L	Internship (4-6 weeks)	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18AUP109L	Project	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18AUP110L	Semester Internship	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
	Program Average	H	H	H	H	H	M	H	M	M	M	M	M	H	H	H

H – High Correlation, M – Medium Correlation, L – Low Correlation

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

Semester - I

Code	Course Title	Hours/ Week L	T	P	C
18LEH10XJ	Chinese / French / German / Japanese/ Korean	2	0	2	3
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18CYB101J	Chemistry	3	1	2	5
18CSS101J	Programming for Problem Solving	3	0	4	5
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18PDM101L	Professional Skills and Practices	0	0	2	0
18LEM102J	Value Education	1	0	1	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
Total Learning Credits					**20**

Semester - II

Code	Course Title	Hours/ Week L	T	P	C
18LEH101J	English	2	0	2	3
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
18AUS101L	Artifact Dissection Laboratory	0	0	2	1
18PDH101T	General Aptitude	0	0	2	1
18LEM101T	Constitution of India	1	0	0	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
Total Learning Credits					**22**

Semester - III

Code	Course Title	Hours/ Week L	T	P	C
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MES201T	Engineering Mechanics	3	1	0	4
18MEC101T	Thermodynamics	3	1	0	4
18AUC201J	Manufacturing Technology for Automotive Engineers	3	0	2	4
18AUC204L	Automotive Components and Assembly drawing	0	0	4	2
18PDH103T	Social Engineering	2	0	0	2
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18CYM101T	Environmental Science	1	0	0	0
Total Learning Credits					**20**

Semester - IV

Code	Course Title	Hours/ Week L	T	P	C
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
18AUC203T	Applied Thermal Engineering for Automotive Engineers	3	1	0	4
18MEC106T	Mechanics of Solids	3	1	0	4
18MEC102T	Fluid Mechanics	3	1	0	4
18MEC104L	Fluid Dynamics Laboratory	0	0	2	1
18MEC109L	Strength of Materials Laboratory	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
Total Learning Credits					**22**

Semester - V

Code	Course Title	Hours/ Week L	T	P	C
18AUC301J	Automotive Engines	3	0	2	4
18MEC201T	Machines and Mechanisms	3	1	0	4
18MEC108T	Materials Technology	3	0	0	3
18MEC111L	Materials Technology Laboratory	0	0	2	1
	Professional Elective – 1	3	0	0	3
	Professional Elective – 2	3	0	0	3
	Open Elective – 1	3	0	0	3
18AUP101L	Massive Open Online Course - I	0	0	2	1
18AUP102L	Industrial Training-I				
18AUP103L	Seminar - I				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM110L	Indian Art Form	0	0	2	0
Total Learning Credits					**22**

Semester - VI

Code	Course Title	Hours/ Week L	T	P	C
18AUC302J	Vehicular Structures and Driveline systems	3	0	2	4
18AUC303J	Automotive Electrical and Electronic Systems	3	0	2	4
18AUC304J	CAD Analysis for Automotive Engineers	3	0	2	4
18AUC305T	Design of Automotive Components	3	0	0	3
18AUC350T	Comprehension	0	1	0	1
	Professional Elective – 3	3	0	0	3
	Open Elective – 2	3	0	0	3
18AUP104L	Massive Open Online Course - II	0	0	2	1
18AUP105L	Industrial Training-II				
18AUP106L	Seminar - II				
18PDH201T	Employability Skills and Practices	0	0	2	1
18LEM109T	Indian Traditional Knowledge	1	0	0	0
Total Learning Credits					**24**

Semester - VII

Code	Course Title	Hours/ Week L	T	P	C
18AUC401J	Vehicle Dynamics	3	0	2	4
18AUC402L	Vehicle Testing laboratory	0	0	2	1
	Professional Elective – 4	3	0	0	3
	Professional Elective – 5	3	0	0	3
	Professional Elective – 6	3	0	0	3
	Open Elective – 3	3	0	0	3
18AUP107L	Minor Project	0	0	6	3
18AUP108L	Internship (4-6 weeks)				
Total Learning Credits					**20**

Semester - VIII

Code	Course Title	Hours/ Week L	T	P	C
18AUP109L	Project	0	0	20	10
18AUP110L	Semester Internship				
Total Learning Credits					**10**