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

41. B.Tech. in Mechanical Engineering (Automation and Robotics)

41. (a) Mission of the Department

Mission Stmt – 1	*To impart quality education to produce eminent mechanical engineers*
Mission Stmt – 2	*To establish Centers of Research Excellence to inculcate research acumen to faculty and students on the emerging thrust areas of mechanical engineering.*
Mission Stmt – 3	*To inculcate progressive education and intricate facts through cognitive training programs to the faculty and students using state-of-art facilities.*

41. (b) Program Educational Objectives (PEO)

PEO – 1	*Practice mechanical engineering in different disciplines towards system design, realization, automated manufacturing systems and robotics.*
PEO – 2	*Enhance professional practice to meet the global standards with ethical and social responsibility.*
PEO – 3	*Provide solutions to industrial, social, and environmental issues with appropriate techniques and tools.*
PEO – 4	*Progress in multi-disciplinary skills and transcend in leadership qualities*

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

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

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

41. (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	3	2	3	3	-	-	-	-	-	-	-	3	3	3
PEO - 2	-	-	3	-	-	3	3	3	-	-	-	3	3	2	-
PEO - 3	3	3	3	3	3	3	3	2	-	1	2	3	3	2	3
PEO - 4	-	3	3	2	3	-	-	-	3	3	3	3	3	3	-

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

PSO – Program Specific Outcomes (PSO)

PSO - 1	*Ability to develop and implement new ideas on product design and development with the help of computer aided tools, automated manufacturing systems and robotics.*
PSO - 2	*Ability to adopt appropriate tools and techniques to solve the problems in various domains of mechanical engineering.*

41. (e) Program Structure: B.Tech. in Mechanical Engineering (Automation and Robotics)

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

Engineering Science Courses (S)

Course Code	Course Title	Hours / Week L	T	P	C
21CSS101J	Programming for Problem Solving	3	0	2	4
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
21MES101T	Engineering Mechanics	3	1	0	4
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21CSS303T	Data Science	2	0	0	2
				Total Credits	21

Open Elective Courses (O)
(Any 3 Course)

Course Code	Course Title	Hours / Week L	T	P	C
21MEO101T	Fundamentals of Composite Materials	3	0	0	3
21MEO102T	Reverse Engineering and 3D Printing	3	0	0	3
21MEO103T	Fundamentals of Biomechanics	3	0	0	3
21MEO104T	TQM and Reliability Engineering	3	0	0	3
21MEO105T	Occupational Safety and Disaster Management	3	0	0	3
21MEO106T	Introduction to Robotics	3	0	0	3
21MEO107T	Fundamentals of Nano Engineering	3	0	0	3
21MEO108T	Computer Numerical Control Programming and Operation	3	0	0	3
21MEO109T	Resource Management Techniques	3	0	0	3
21MEO110T	Energy Systems for Sustainable Buildings	3	0	0	3
21MEO111T	Environmental Pollution and Abetment	3	0	0	3
21MEO112T	Renewable Energy Sources and Application	3	0	0	3
21MEO113J	Electronics Thermal Management	2	0	2	3
21MEO114T	Solar Energy for Societal Applications	3	0	0	3
21MEO115T	Introduction to Drones	3	0	0	3
				Total Credits	09

Basic Science Courses (B)

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

Professional Core Courses (C)

Course Code	Course Title	Hours / Week L	T	P	C
21MEC201T	Engineering Thermodynamics	3	0	0	3
21MEC202T [2]	Mechanics of Solids	3	1	0	4
21MEC203T	Engineering Materials and Metallurgy	3	0	0	3
21MEC204T	Manufacturing Processes and Metrology	3	0	0	3
21MEC201L [1]	Manufacturing Processes and Metrology Laboratory	0	0	2	1
21MEC202L [1]	Material Testing Laboratory	0	0	2	1
21CSC206T	Artificial Intelligence	3	0	0	3
21MEC205T [2]	Fluid Mechanics and Machinery	3	0	0	3
21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3
21MEC203L [1]	Machine Dynamics Laboratory	0	0	2	1
21MEC204L [1]	Fluid Dynamics Laboratory	0	0	2	1
21MEC205L [1]	Mechanical Modeling and Assembly	0	0	4	2
21MEC301T	Thermal Systems Engineering	3	1	0	4
21MEC301P [1]	Design of Mechanical Systems	3	0	0	3
21MEC302T [2]	Sensors and Control Systems	3	0	0	3
21MEC301L [1]	Thermal Power Systems Laboratory	0	0	2	1
21MEC302L [1]	Automation and Control Systems Laboratory	0	0	2	1
21MEC301J	Heat and Mass Transfer	3	0	2	4
21MEC302J [2]	Finite Element Methods	3	0	2	4
21MEC303T	Industry 4.0	3	0	0	3
				Total Credits	51

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 5 Courses)*					
Course Code	Course Title	Hours / Week			
		L	T	P	C
21MEE361T	*PLC and Virtual Instrumentation*	*2*	*0*	*2*	*3*
21MEE362T	*Mechatronics for Automation and Robotics*	*3*	*0*	*0*	*3*
21MEE363T	*Industrial Internet of Things*	*3*	*0*	*0*	*3*
21MEE364T	*Advanced Automation Systems*	*3*	*0*	*0*	*3*
21MEE365T	*Robot System Design*	*3*	*0*	*0*	*3*
21MEE366T	*Robot Mechanics and Control*	*3*	*0*	*0*	*3*
21MEE367T	*Soft Robots*	*3*	*0*	*0*	*3*
21MEE368T	*Autonomous Robot Vehicles*	*3*	*0*	*0*	*3*
21MEE369J	*Robot Applications and Programming*	*2*	*0*	*2*	*3*
21MEE370T	*Microsystems Design and Applications*	*3*	*0*	*0*	*3*
				Total Credits	**15**

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*
21MEP302L [1]	*Project*	*0*	*0*	*6*	*3*
21MEP303T [1]	*MOOC*	*3*	*0*	*0*	
21MEP401L	*Major Project*	*0*	*0*	*30*	*15*
21MEP402L	*Major Project*	*0*	*0*	*20*	*10*
21MEP403L	*Internship#*	*0*	*0*	*10*	*5*
				Total Credits	**19**

41. (f) Programme Articulation: B.Tech. in Mechanical Engineering (Automation and Robotics)

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
21MEC201T	*Engineering Thermodynamics*	*3*	*3*													
21MEC202T	*Mechanics of Solids*	*3*	*2.6*													
21MEC203T	*Engineering Materials and Metallurgy*	*2.3*		*2.2*		*2*										
21MEC204T	*Manufacturing Processes and Metrology*		*2.7*	*2.5*	*3*	*2.5*									*2*	
21MEC201L	*Manufacturing Processes and Metrology Laboratory*			*1.4*	*3*	*1.5*										
21MEC202L	*Material Testing Laboratory*				*3*	*2*				*1*						
21MEC205T	*Fluid Mechanics and Machinery*	*3*	*3*													
21MEC206T	*Kinematics and Dynamics of Machines*	*3*	*3*													
21MEC203L	*Machine Dynamics Laboratory*	*3*	*2*			*1*										
21MEC204L	*Fluid Dynamics Laboratory*	*3*								*3*						
21MEC205L	*Mechanical Modelling and Assembly*	*2.2*				*3*					*2.8*					
21MEC301T	*Thermal Systems Engineering*	*3*						*1*								
21MEC301P	*Design of Mechanical Systems*	*3*		*3*						*2*						
21MEC302T	*Sensors and Control Systems*	*3*				*3*								*3*	*3*	
21MEC301L	*Thermal Power Systems Laboratory*	*3*						*3*						*1.8*		
21MEC302L	*Automation and Control Systems Laboratory*			*2.7*		*1*				*1.5*				*1*	*2*	
21MEC301J	*Heat and Mass Transfer*	*3*			*3*											
21MEC302J	*Finite Element Methods*		*3*		*3*	*2*										
21MEC303T	*Industry 4.0*	*1.4*	*2.5*	*2.3*		*1.5*	*3*	*2*						*2*	*2*	
21MEE361T	*PLC and Virtual Instrumentation*															
21MEE362T	*Mechatronics for Automation and Robotics*															
21MEE363T	*Industrial Internet of Things*															
21MEE364T	*Advanced Automation Systems*															
21MEE365T	*Robot System Design*															
21MEE366T	*Robot Mechanics and Control*															
21MEE367T	*Soft Robots*															
21MEE368T	*Autonomous Robot Vehicles*															
21MEE369J	*Robot Applications and Programming*															
21MEE370T	*Microsystems Design and Applications*															
21GNP301L	*Community Connect*															
21MEP302L	*Project*	*3*	*2*	*2*	*3*	*3*	*3*	*1*	*3*	*3*	*3*	*3*	*3*			
21MEP303T	*MOOC*	*3*	*2*	*2*	*3*	*3*	*3*		*3*	*3*	*3*		*3*			
21MEP401L	*Major Project*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	
21MEP402L	*Major Project*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	
21MEP403L	*Internship*	*3*	*2*	*2*	*3*	*3*	*3*	*1*	*3*	*3*	*3*	*3*	*3*			
Program Average																

41. (g) Implementation Plan: B.Tech. in Mechanical Engineering (Automation and Robotics)

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
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	**18**

Semester – III

Course Code	Course Title	Hours / Week L	T	P	C
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21MEC201T	Engineering Thermodynamics	3	0	0	3
21MEC202T [2]	Mechanics of Solids	3	1	0	4
21MEC203T	Engineering Materials and Metallurgy	3	0	0	3
21MEC204T	Manufacturing Processes and Metrology	3	0	0	3
21MEC201L [1]	Manufacturing Processes and Metrology Laboratory	0	0	2	1
21MEC202L [1]	Material Testing Laboratory	0	0	2	1
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
				Total Credits	**24**

Semester – V

Course Code	Course Title	Hours / Week L	T	P	C
21MAB301T	Probability and Statistics	3	1	0	4
21MEC301T	Thermal Systems Engineering	3	1	0	4
21MEC301P [1]	Design of Mechanical Systems	3	0	0	3
21MEC302T [2]	Sensors and Control Systems	3	0	0	3
E	Professional Elective – II	3	0	0	3
O	Open Elective – I	3	0	0	3
21MEC301L [1]	Thermal Power Systems Laboratory	0	0	2	1
21MEC302L [1]	Automation and Control Systems Laboratory	0	0	2	1
21PDM301L [1]	Analytical and Logical Thinking Skills	0	0	2	0
21LEM301T [1]	Indian Art Form	1	0	0	0
21GNP301L [1]	Community Connect	0	0	2	1
				Total Credits	**23**

Semester – VII

Course Code	Course Title	Hours / Week L	T	P	C
21GNH401T	Behavioral Psychology	2	1	0	3
E	Professional Elective – IV	3	0	0	3
E	Professional Elective – V	3	0	0	3
O	Open Elective – III	3	0	0	3
				Total Credits	**12**

#Students have to register either 21MEP401L or 21MEP402L and 21MEP403L both in eighth semester

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
21MES101T	Engineering Mechanics	3	1	0	4
21CSS101J	Programming for Problem Solving	3	0	2	4
21BTB103T	Biology	2	0	0	2
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 – IV

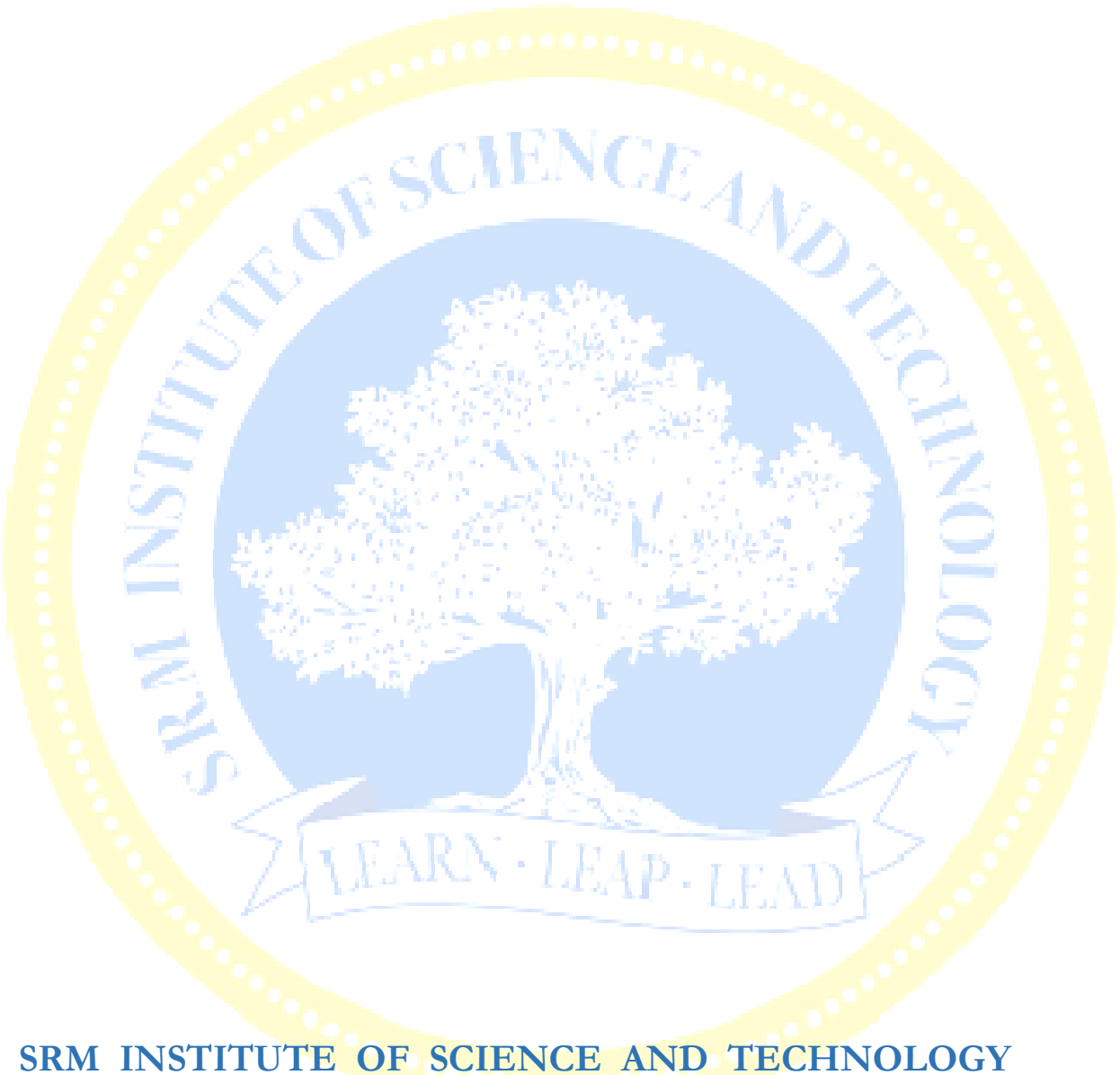
Course Code	Course Title	Hours / Week L	T	P	C
21MAB202T	Numerical Methods	3	1	0	4
21CSC206T	Artificial Intelligence	2	1	0	3
21MEC205T [2]	Fluid Mechanics and Machinery	3	0	0	3
21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3
E	Professional Elective – I	3	0	0	3
21MEC203L [1]	Machine Dynamics Laboratory	0	0	2	1
21MEC204L [1]	Fluid Dynamics Laboratory	0	0	2	1
21MEC205L [1]	Mechanical Modeling and Assembly	0	0	4	2
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	0
				Total Credits	**23**

Semester – VI

Course Code	Course Title	Hours / Week L	T	P	C
21CSS303T	Data Science	2	0	0	2
21MEC301J	Heat and Mass Transfer	3	0	2	4
21MEC302J [2]	Finite Element Methods	3	0	2	4
21MEC303T	Industry 4.0	3	0	0	3
E	Professional Elective – III	3	0	0	3
21MEP302L [1]	Project	0	0	6	3
21MEP303T [1]	MOOC	3	0	0	
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	**22**

Semester - VIII

Course Code	Course Title	Hours / Week L	T	P	C
21MEP401L	Major Project	0	0	30	15
21MEP402L	Major Project	0	0	20	10
21MEP403L	Internship#	0	0	10	5
				Total Credits	**15**



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

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