

ACADEMIC CURRICULA

POST GRADUATE DEGREE PROGRAMMES

Master of Technology

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 21 Curriculum



SRM

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

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

42. M.Tech in Mechatronics Engineering

42. (a) Department Vision Statement

Stmnt - 1	<i>To impart structured theory and extensive practical experience in all the sub-fields contributing to Mechatronics Engineering to make our engineers as experts in multi-disciplinary system integration.</i>
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42. (b) Department Mission Statement

Stmnt - 1	<i>To impart high-quality education in mechatronics with ethical values to meet global excellence.</i>
Stmnt - 2	<i>To establish state-of-the-art laboratories and pave the way to create exposure in research through international collaborations for interdisciplinary areas.</i>
Stmnt - 3	<i>To inculcate entrepreneurship and mankind qualities to meet the expectations of industry and the needs of society.</i>

42. (c) Program Education Objectives (PEO)

PEO - 1	<i>Impart knowledge and skills in a multi-disciplinary approach through use of modern technologies and tools so as to enable development of innovative and sustainable products.</i>
PEO - 2	<i>Develop a perspective of a system integrator which involves the understanding of handshaking of various sub-systems of a complex multi-disciplinary system.</i>
PEO - 3	<i>Work or pursue research career in multicultural, multilingual and multinational environment with competent oral and written communication</i>
PEO - 4	<i>Lead and contribute in a team entrusted with professional, social and ethical responsibilities</i>
PEO - 5	<i>Enable the skills to identify the scope for modernization of industries in the terms of sustainable automated solutions through the structured acquisition of knowledge and skills as part of mechatronics education</i>

42. (d) Consistency of PEO's with Mission of the Department

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

42. (e) PO – Program Outcomes

PO - 1	<i>An ability to independently carry out research /investigation and development work to solve practical problems.</i>
PO - 2	<i>An ability to write and present a substantial technical report/document.</i>
PO - 3	<i>Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.</i>

42. (f) Consistency of PEO's with Program Outcomes (PO)

	Program Outcomes (PO)		
	1	2	3
PEO - 1			
PEO - 2			
PEO - 3			
PEO - 4			
PEO - 5			

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

42. (g) Programme Structure: M.Tech in Mechatronics Engineering

Professional Core Courses (C)							Professional Elective Courses (E) (Any 7 Courses)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21MHC501J	Advanced System Dynamics	3	0	2	4		21MHE521J	Industrial Manipulators- Kinematics, Dynamics and Control	2	0	2	3	
21MHC502P ¹	Elements of Mechatronics	1	0	6	4		21MHE529T	Industrial Automation	3	0	0		
21MHC503J	Drives and Actuators	3	0	2	4		21MHE522J	Modern Control Engineering	2	0	2		
21MHC504J	Mechatronics System Design	3	0	2	4		21MHE528J	Digital Manufacturing and Smart Factories	2	0	2	3	
21MHC505L ¹	Real-Time Embedded Systems	0	0	6	3		21MHE523T	Mechatronics Applications in Science and Engineering	3	0	0	3	
21IPC501J ²	Research Methodology	2	1	2	4		21MHE524J	Computer Vision	2	0	2		
21MHC601T ¹	Case Studies	3	0	0	3		21MHE525J	Machine Learning and Deep Learning	2	0	2	3	
Total Credits						26	21MHE527J	Autonomous Mobile Robotics	2	0	2		
							21MHE526T	Vetronics	3	0	0	3	
							21MHE535T	Automotive Technology	3	0	0		
							21MHE532L ¹	Robot Programming Laboratory	0	0	6		
							21MHE533T	Mechatronics in Electric Vehicle	3	0	0	3	
							21MHE600T ¹	Journal Publication	0	0	0		
							21MHE530T	Smart Materials and Systems	3	0	0		
							21MHE531J	X-Reality and Haptics	2	0	2	3	
							21MHE534T	Automotive Software	3	0	0		
							Total Credits						21
Project Work, Internship In Industry / Higher Technical Institutions (P)							100% assessment by the Department (¹)						
Course Code	Course Title	Hours/Week			C		Course Code	Course Title	Hours/Week			C	
		L	T	P					L	T	P		
21MHP501L	Specialization Project (OR)	0	0	40	20		21MHC601T ¹	Case Studies	3	0	0	3	
21MHP502L	Specialization Project	0	0	30	15		21MHE600T ¹	Journal Publication	0	0	0	3	
21MHP503L	Domain Internship	0	0	10	5		21MHC502P ¹	Elements of Mechatronics	1	0	6	4	
Total Credits						20	21MHC505L ¹	Real-Time Embedded Systems	0	0	6	3	
							21MHE532L ¹	Robot Programming Laboratory	0	0	6	3	
Assessment by Open Book Examination (²)													
Course Code	Course Title	Hours/Week			C								
		L	T	P									
21IPC501J ²	Research Methodology	2	1	2	4								

All elective courses may be studied under MOOC platform

¹ 100% assessment by the Department

² Assessment by Open Book Examination

³ Course Delivery through online mode

42. (h) Implementation Plan: M.Tech in Mechatronics Engineering

Semester - I						
Code	Course Title	Hours/ Week				
		L	T	P	C	
21MHC501J	Advanced System Dynamics	3	0	2	4	
21MHC502P ¹	Elements of Mechatronics	1	0	6	4	
21MHC503J	Drives and Actuators	3	0	2	4	
21IPC501J ²	Research Methodology	2	1	2	4	
21MHE521J	Industrial Manipulators- Kinematics, Dynamics and Control	2	0	2		3
21MHE529T	Industrial Automation	3	0	0		
Total Credits						18

Semester - II						
Code	Course Title	Hours/ Week				
		L	T	P	C	
21MHC504J	Mechatronics System Design	3	0	2	4	
21MHC505L ¹	Real-Time Embedded Systems	0	0	6	3	
21MHE522J	Modern Control Engineering	2	0	2		
21MHE528J	Digital Manufacturing and Smart Factories	2	0	2		3
21MHE523T	Mechatronics Applications in Science and Engineering	3	0	0		3
21MHE524J	Computer Vision	2	0	2		
21MHE525J	Machine Learning and Deep Learning	2	0	2		3
21MHE527J	Autonomous Mobile Robotics	2	0	2		
Total Credits						17

Semester - III						
Code	Course Title	Hours/ Week				
		L	T	P	C	
	Open Elective	3	0	0	3	
21MHE526T	Vetronics	3	0	0		3
21MHE535T	Automotive Technology	3	0	0		
21MHE532L ¹	Robot Programming Laboratory	0	0	6		
21MHE533T	Mechatronics in Electric Vehicle	3	0	0		3
21MHE600T ¹	Journal Publication	0	0	0		
21MHE530T	Smart Materials and Systems	3	0	0		
21MHE531J	X-Reality and Haptics	2	0	2		3
21MHE534T	Automotive Software	3	0	0		
21MHC601T ¹	Case Studies	3	0	0		3
Total Credits						15

Semester - IV						
Code	Course Title	Hours/ Week				
		L	T	P	C	
21MHP501L	Specialization Project	0	0	40	20	
(OR)						
21MHP502L	Specialization Project	0	0	30	15	
21MHP503L	Domain Internship	0	0	10	5	
Total Credits						20
# Students must register either 21MHP501L or 21MHP502L and 21MHP503L both in fourth semester						

42. (i) Program Articulation Matrix: M.Tech Mechatronics Engineering

Course Code	Course Name	Programme Outcomes		
		1	2	3
21MHC501J	Advanced System Dynamics			
21MHC502P	Elements of Mechatronics			
21MHC503J	Drives and Actuators			
21MHC504J	Mechatronics System Design			
21MHC505L	Real-Time Embedded Systems			
21MHC601T	Case Studies			
21MHE521J	Industrial manipulators- Kinematics, Dynamics and control			
21MHE522J	Modern Control Engineering			
21MHE523T	Mechatronics applications in Science and Engineering			
21MHE524J	Computer Vision			
21MHE525J	Machine learning and Deep Learning			
21MHE526T	Vetronics			
21MHE527J	Autonomous Mobile Robotics			
21MHE528J	Digital Manufacturing and Smart Factories			
21MHE529T	Industrial Automation			
21MHE530T	Smart Materials and Systems			
21MHE531J	X-Reality and Haptics			
21MHE532L	Robot Programming Laboratory			
21MHE533T	Mechatronics in Electric Vehicle			
21MHE534T	Automotive Software			
21MHE535T	Automotive Technology			
21MHE600T	Journal Publication			
21IPC501J	Research Methodology	3	2.6	
	Open Elective			
21MHP501L	Specialization Project			
21MHP502L	Specialization Project			
21MHP503L	Domain Internship			
Program Average				

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

43. M.Tech in Nanotechnology

43. (a) Department Vision Statement

Stmnt - 1	<i>To evolve as a world-class hub in Physics and Nanotechnology to meet the rapidly changing global scientific and technological needs for societal development.</i>
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43. (b) Department Mission Statement

Stmnt - 1	<i>To impart quality education both in theory and experiment with state-of-the-art infrastructure to develop scientific temper in young minds.</i>
Stmnt - 2	<i>To carry out multidisciplinary research of fundamental and technological importance by partnering with leading global institutions and industries.</i>
Stmnt - 3	<i>To develop various skill sets and translate scientific ideas into product innovations to enhance the employability and serve the society.</i>

43. (c) Program Education Objectives (PEO)

PEO - 1	<i>Develop strong background in nanoscience and nanotechnology by employing the scientific concepts for higher-level understanding of the matter at the nanoscale</i>
PEO - 2	<i>Employ critical thinking, analytical problem-solving skills in the basic and applied areas of nanotechnology using state of the art tools.</i>
PEO - 3	<i>Prepare students to work effectively in diverse teams in both class-room and laboratory with integrated, cross-disciplinary scientific knowledge and professional skills.</i>
PEO - 4	<i>Equip the students with professional, scientific and computational skills for employment opportunities and self-empowering them to create job opportunities and entrepreneurship</i>
PEO - 5	<i>Appreciate the need for engaging independent and life-long learning in the broadest context of technological changes and operate within the regulatory framework.</i>

43. (d) Consistency of PEO's with Mission of the Department

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

43. (e) PO – Program Outcomes

PO - 1	<i>An ability to independently carry out research /investigation and development work to solve practical problems.</i>
PO - 2	<i>An ability to write and present a substantial technical report/document.</i>
PO - 3	<i>Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.</i>

43. (f) Consistency of PEO's with Program Outcomes (PO)

	Program Outcomes (PO)		
	1	2	3
PEO - 1	3	3	2
PEO - 2	3	3	2
PEO - 3	3	3	2
PEO - 4	3	3	3
PEO - 5	3	3	3

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



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