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)

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Kattankulathur, Chengalpattu District 603203,

Tamil Nadu, India

39 M.Tech in Robotics

39. (a) Department Vision Statement

Stmt - 1	*To enhance learning and research skills in mechanical engineering and allied fields to accomplish crest positions in world-renowned organizations.*

39. (b) Department Mission Statement

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

39. (c) Program Education Objectives (PEO)

PEO - 1	*Graduates will be able to perform in different disciplines towards system design, control, programming and development of robotic systems in various associated industries*
PEO - 2	*Graduates will be able to enhance their professional practice to meet the global standards with ethical and social responsibility.*
PEO - 3	*Graduates will have the ability to adapt, contribute and innovate new technologies and systems in the key domains of Robotics and manufacturing.*
PEO - 4	*Graduates will develop skill to become an entrepreneur*
PEO - 5	*Graduates will work in team and involving lifelong learning to attain a good professional life.*

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

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

39. (e) PO – Program Outcomes

PO - 1	*An ability to independently carry out research /investigation and development work to solve practical problems.*
PO - 2	*An ability to write and present a substantial technical report/document.*
PO - 3	*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.*

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

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

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

39. (g) Programme Structure: M.Tech Robotics

Professional Core Courses (C)

Course Code	Course Title	Hours/ Week L	T	P	C
21MEC521J	Robotics Engineering	2	0	2	3
21MEC522J	Applied Statistical Machine Learning	3	0	2	4
21MEC523J	Embedded systems and interfacing for Robot	3	0	2	4
21MEC524J	Kinematics, Dynamics, and Control System for Robot	3	0	2	4
21MEC525J	Robot Programming and Simulation	3	0	2	4
21IPC501J [2]	Research Methodology	2	1	2	4
21MEC601T [1]	Case Studies	3	0	0	3
	Total Credits				**26**

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

Course Code	Course Title	Hours/ Week L	T	P	C
21MEP501L	Specialization Project	0	0	40	20
	(OR)				
21MEP502L	Specialization Project	0	0	30	15
21MEP503L	Domain Internship	0	0	10	5
	Total Credits				**20**

Assessment by Open Book Examination ([2])

Course Code	Course Title	Hours/ Week L	T	P	C
21MEE530J [2]	Finite Element Analysis	2	0	2	3
21IPC501J [2]	Research Methodology	2	1	2	4

Course Delivery by online mode ([3])

Course Code	Course Title	Hours/ Week L	T	P	C
21MEE622J [3]	Deep Learning	2	0	2	3
21MEE602J [3]	Additive Manufacturing Technology	2	0	2	3

Professional Elective Courses (E)
(Any 7 Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
21MEE521J	Robot Vision	2	0	2	3
21MEE522J	Advanced Robotic Sensors	2	0	2	
21MEE523T	Advanced Control System	3	0	0	
21MEE524T	AI for Robots	3	0	0	3
21MEE525J	Internet of Robotic Things (RIoT)	2	0	2	
21MEE526T	Smart Mobility Robots	3	0	0	3
21MEE527T	Humanoid Robot	3	0	0	
21MEE528T	Nano Robots	3	0	0	
21MEE529J	Fuzzy Logic and Expert System	2	0	2	
21MEE530J [2]	Finite Element Analysis	2	0	2	3
21MEE621J	Optimization with Applications in Robotics	2	0	2	
21MEE622J [3]	Deep Learning	2	0	2	3
21MEE623J	Big Data and Cloud Computing	2	0	2	
21MEE624P [1]	Robot System Design	2	0	2	
21MEE625T	Rehabilitation and Medical Robotics	3	0	0	3
21MEE626J	Connected Robots	2	0	2	
21MEE627T	Bio-inspired and Soft Robotics	3	0	0	
21MEE628J	Robotics for Industrial Automation	2	0	2	
21MEE600T [1]	Journal Publication	0	0	0	
21MEE602J [3]	Additive Manufacturing Technology	2	0	2	3
21MEE629J	Augmented Reality and Virtual Reality	2	0	2	
21MEE630J	Natural Language Processing	2	0	2	
	Total Credits				**21**

Open Elective Course (O)

Course Code	Course Title	Hours/ Week L	T	P	C
21MEO501T	Industrial Safety	3	0	0	3
21MEO502T	Entrepreneurship and IPR	3	0	0	3
21MEO503T	Operations Research	3	0	0	3
21MEO504T	Human Body Mechanics	3	0	0	3
21MEO505T	Energy Storage Systems	3	0	0	3
	Total Credits				**3**

100% assessment by the Department ([1])

Course Code	Course Title	Hours/ Week L	T	P	C
21MEC601T [1]	Case Studies	3	0	0	3
21MEE624P [1]	Robot System Design	2	0	2	3
21MEE600T [1]	Journal Publication	0	0	0	3

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

39. (h) Implementation Plan: M.Tech Robotics

Semester - I					
Code	Course Title	Hours/ Week			
		L	T	P	C
21MEC521J	Robotics Engineering	2	0	2	3
21MEC522J	Applied Statistical Machine Learning	3	0	2	4
21MEC523J	Embedded Systems and Interfacing for Robot	3	0	2	4
21IPC501J [2]	Research Methodology	2	1	2	4
21MEE521J	Robot Vision	2	0	2	3
21MEE522J	Advanced Robotic Sensors	2	0	2	
21MEE523T	Advanced Control System	3	0	0	
Total Credits					**18**

Semester - II					
Code	Course Title	Hours/ Week			
		L	T	P	C
21MEC524J	Kinematics, Dynamics, and Control System for Robot	3	0	2	4
21MEC525J	Robot Programming and Simulation	3	0	2	4
21MEE524T	AI for Robots	3	0	0	3
21MEE525J	Internet of Robotic things (RIoT)	2	0	2	
21MEE526T	Smart Mobility Robots	3	0	0	3
21MEE527T	Humanoid Robot	3	0	0	
21MEE528T	Nano Robots	3	0	0	
21MEE529J	Fuzzy Logic and Expert System	2	0	2	
21MEE530J [2]	Finite Element Analysis	2	0	2	
21MEE621J	Optimization with Applications in Robotics	2	0	2	
Total Credits					**17**

Semester - III					
Code	Course Title	Hours/ Week			
		L	T	P	C
	Open Elective	3	0	0	3
21MEE622J [3]	Deep Learning	2	0	2	3
21MEE623J	Big Data and Cloud computing	2	0	2	
21MEE624P [1]	Robot System Design	2	0	2	
21MEE625T	Rehabilitation and Medical Robotics	3	0	0	3
21MEE626J	Connected Robots	2	0	2	
21MEE627T	Bio-inspired and Soft Robotics	3	0	0	
21MEE628J	Robotics for Industrial Automation	2	0	2	
21MEE600T [1]	Journal Publication	0	0	0	
21MEE602J [3]	Additive Manufacturing Technology	2	0	2	3
21MEE629J	Augmented Reality and Virtual Reality	2	0	2	
21MEE630J	Natural Language Processing	2	0	2	
21MEC601T [1]	Case Studies	3	0	0	3
Total Credits					**15**

Semester - IV					
Code	Course Title	Hours/ Week			
		L	T	P	C
21MEP501L	Specialization Project	0	0	40	20
	(OR)				
21MEP502L	Specialization Project	0	0	30	15
21MEP503L	Domain Internship	0	0	10	5
Total Credits					**20**

 # Students must register either 21MEP501L or 21MEP502L and 21MEP503L both in fourth semester

39. (i) Program Articulation Matrix: M.Tech Robotics

Course Code	Course Name	Programme Outcomes		
		1	2	3
21MEC521J	*Robotics Engineering*	*2.5*	*0.5*	*0*
21MEC522J	*Applied Statistical Machine Learning*	*2.8*	*2.6*	*2.4*
21MEC523J	*Embedded systems and interfacing for Robot*	*1.6*	*0.2*	*2.6*
21MEC524J	*Kinematics, Dynamics, and Control System for Robot*	*2.4*	*1.2*	*2*
21MEC525J	*Robot Programming and Simulation*	*1.6*	*0.6*	*3*
21MEE521J	*Robot Vision*	*1.8*	*2*	*2.2*
21MEE522J	*Advanced Robotic Sensors*	*2.6*	*0*	*0.6*
21MEE523T	*Advanced Control System*	*2.6*	*0*	*1.4*
21MEE524T	*AI for Robots*	*1.4*	*2.2*	*1.8*
21MEE525J	*Internet of Robotic Things (RIoT)*	*2.6*	*0.6*	*0.8*
21MEE526T	*Smart Mobility Robots*	*2.2*	*0.4*	*1.8*
21MEE527T	*Humanoid Robot*	*2.6*	*0*	*1*
21MEE528T	*Nano Robots*	*2.6*	*0*	*0.6*
21MEE529J	*Fuzzy Logic and Expert System*	*1*	*1.8*	*2.2*
21MEE530J	*Finite Element Analysis*	*3*		*2*
21MEE621J	*Optimization with Applications in Robotics*	*2*	*2*	*0*
21MEE622J	*Deep Learning*	*2*	*2*	*0*
21MEE623J	*Big Data and Cloud Computing*	*2*	*1.2*	*0*
21MEE624P	*Robot System Design*	*2*	*1*	*1*
21MEE625T	*Rehabilitation and Medical Robotics*	*2.4*	*0.4*	*1.2*
21MEE626J	*Connected Robots*	*2.4*	*1*	*1.2*
21MEE627T	*Bio-inspired and Soft Robotics*	*1.8*	*0.8*	*2.6*
21MEE628J	*Robotics for Industrial Automation*	*1.6*	*0.4*	*0.8*
21MEE602J	*Additive Manufacturing Technology*	*2*		*2*
21MEE629J	*Augmented Reality and Virtual Reality*	*2.6*	*0*	*2.4*
21MEE630J	*Natural Language Processing*	*2.6*	*0*	*2.4*
21MEE600T	*Journal Publication*			
21IPC501J	*Research Methodology*	*3*	*2.6*	
	Open Elective			
21MEC601T	*Case Studies*			
21MEP501L	*Specialization Project*			
21MEP502L	*Specialization Project*			
21MEP503L	*Domain Internship*			
	Program Average			

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

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