

ACADEMIC CURRICULA
UNDERGRADUATE/ INTEGRATED
POST GRADUATE DEGREE
PROGRAMMES

(With exit option of Diploma)

(Choice Based Flexible Credit System)

Regulations 2021

Volume – 1

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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

40. B.Tech. in Mechanical Engineering with Specialization in Artificial Intelligence and Machine Learning

40. (a) Mission of the Department

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

40. (b) Program Educational Objectives (PEO)

PEO – 1	<i>Practice mechanical engineering in different disciplines towards system design, realization, manufacturing, and industrial automation</i>
PEO – 2	<i>Enhance professional practice to meet the global standards with ethical and social responsibility</i>
PEO – 3	<i>Solve industrial, social, and environmental problems with appropriate techniques and tools</i>
PEO – 4	<i>Work in large cross-functional teams and pursue life-long learning</i>

40. (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

40. (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	PSO-1	PSO-2	PSO-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			
PEO - 1	3	3	2	3	3	-	-	-	-	-	-	-	3	3	-
PEO - 2	-	-	3	-	-	3	3	3	-	-	-	3	-	-	-
PEO - 3	3	3	3	3	3	3	3	2		1	2	3	3	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	<i>Ability to analyse and implement AI techniques in mechanical engineering</i>
PSO - 2	<i>Ability to design and develop the contemporary programmable interfaces in mechanical systems</i>

40. (e) Program Structure: B.Tech. in Mechanical Engineering with Specialization in Artificial Intelligence and Machine Learning

Humanities & Social Sciences including Management Courses (H)						Basic Science Courses (B)					
Course Code	Course Title	Hours/ Week				Course Code	Course Title	Hours/ Week			
		L	T	P	C			L	T	P	C
21LEH101T	Communicative English	2	1	0	3	21MAB101T	Calculus and Linear Algebra	3	1	0	4
21LEH102T	Chinese	2	1	0	3	21CYB101J	Chemistry	3	1	2	5
21LEH103T	French					21BTB103T	Biology	2	0	0	2
21LEH104T	German					21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
21LEH105T	Japanese					21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
21LEH106T	Korean					21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21LEH107T	Spanish					21MAB202T	Numerical Methods	3	1	0	4
21LEH108T	Russian					21MAB301T	Probability and Statistics	3	1	0	4
21GNH101J	Philosophy of Engineering	1	0	2	2	Total Credits 32					
21PDH209T ¹	Social Engineering	2	0	0	2						
21GNH401TA	Behavioral Psychology	2	1	0	3						
Total Credits 13											
Open Elective Courses (O) (Any 3 Course)						Non Credit Courses (M)					
Course Code	Course Title	Hours/ Week				Course Code	Course Title	Hours / Week			
		L	T	P	C			L	T	P	C
21MEO101T	Fundamentals of Composite Materials	3	0	0	3	21PDM101L ¹	Professional Skills and Practices	0	0	2	0
21MEO102T	Reverse Engineering and 3D Printing	3	0	0	3	21PDM102L ¹	General Aptitude	0	0	2	
21MEO103T	Fundamentals of Biomechanics	3	0	0	3	21PDM201L ¹	Verbal Reasoning	0	0	2	
21MEO104T	TQM and Reliability Engineering	3	0	0	3	21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2	
21MEO105T	Occupational Safety and Disaster Management	3	0	0	3	21PDM301L ¹	Analytical and Logical Thinking Skills	0	0	2	
21MEO106T	Introduction to Robotics	3	0	0	3	21PDM302L ¹	Employability Skills and Practices	0	0	2	0
21MEO107T	Fundamentals of Nano Engineering	3	0	0	3	21CYM101T ¹	Environmental Science	1	0	0	
21MEO108T	Computer Numerical Control Programming and Operation	3	0	0	3	21LEM101T ¹	Constitution of India	1	0	0	
21MEO109T	Resource Management Techniques	3	0	0	3	21LEM102T ¹	Universal Human Values – Introduction	1	0	0	
21MEO110T	Energy Systems for Sustainable Buildings	3	0	0	3	21LEM201T ¹	Professional Ethics	1	0	0	
21MEO111T	Environmental Pollution and Abetment	3	0	0	3	21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3
21MEO112T	Renewable Energy Sources and Application	3	0	0	3	21LEM301T ¹	Indian Art Form	1	0	0	0
21MEO113J	Electronics Thermal Management	2	0	2	3	21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0
21MEO114T	Solar Energy for Societal Applications	3	0	0	3	21GNM101L ¹	Physical and Mental Health using Yoga	0	0	2	0
21MEO115T	Introduction to Drones	3	0	0	3	21GNM102L ¹	National Service Scheme				
Total Credits 09					21GNM103L ¹	National Cadet Corps					
					21GNM104L ¹	National Sports Organization					
						Total Credits 03					
Professional Elective Courses (E) (Any 5 Courses)						Professional Core Courses (C)					
Course Code	Course Title	Hours/ Week				Course Code	Course Title	Hours / Week			
		L	T	P	C			L	T	P	C
21MEE351J	IoT Systems Design	2	0	2	3	21MEC201T	Engineering Thermodynamics	3	0	0	3
21MEE352J	Programming for Machine Learning	2	0	2	3	21MEC202T ²	Mechanics of Solids	3	1	0	4
21MEE353T	Mathematics for Machine Learning	3	0	0	3	21MEC203T	Engineering Materials and Metallurgy	3	0	0	3
21MEE354T	Soft Computing Techniques and Applications	3	0	0	3	21MEC204T	Manufacturing Processes and Metrology	3	0	0	3
21MEE355T	Artificial Neural Network	3	0	0	3	21MEC201L ¹	Manufacturing Processes and Metrology Laboratory	0	0	2	1
21MEE356T	Machine Diagnostics and Condition Monitoring	3	0	0	3	21MEC202L ¹	Material Testing Laboratory	0	0	2	1
21MEE357T	Digital Signal and Image Processing	3	0	0	3	21CSC206T	Artificial Intelligence	3	0	0	3
21MEE358T	Machine Learning Theory and Applications	3	0	0	3	21MEC205T ²	Fluid Mechanics and Machinery	3	0	0	3
21MEE359T	Artificial Intelligence Applications in Mechanical Engineering	3	0	0	3	21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3
Total Credits 15						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
Engineering Science Courses (S)						Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)										
Course Code	Course Title	Hours/Week				Course Code	Course Title	Hours / Week								
		L	T	P	C			L	T	P	C					
21CSS101J	Programming for Problem Solving	3	0	2	4	21GNP301L ¹	Community Connect	0	0	2	1					
21MES101L ¹	Basic Civil and Mechanical Workshop	0	0	4	2	21MEP302L ¹	Project	0	0	6	3					
21MES102L ¹	Engineering Graphics and Design	0	0	4	2	21MEP303T ¹	MOOC	3	0	0						
21EES101T	Electrical and Electronics Engineering	3	1	0	4	21MEP401L	Major Project	0	0	30	15					
21MES101T	Engineering Mechanics	3	1	0	4	21MEP402L	Major Project	0	0	20	10					
21DCS201P ¹	Design Thinking and Methodology	1	2	0	3	21MEP403L	Internship#	0	0	10	5					
21CSS303T	Data Science	2	0	0	2							Total Credits				19
Total Credits						21										



40. (f) Programme Articulation: B.Tech. in Mechanical Engineering with Specialization in Artificial Intelligence and Machine Learning

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	-
21MEE351J	IoT Systems Design	-	-	2	1.2	1	-	-	-	-	-	-	-	-	1	-
21MEE352J	Programming for Machine Learning	-	2	-	3	-	-	-	-	-	-	-	-	2	-	-
21MEE353T	Mathematics for Machine Learning	-	3	2.2	-	-	-	-	-	-	-	-	1	1.5	1	-
21MEE354T	Soft Computing Techniques and its Applications	-	-	2.8	3	-	-	-	-	-	-	-	-	2	3	-
21MEE355T	Artificial Neural Network	-	2.8	-	3	2.8	-	-	-	-	-	-	-	1.8	-	-
21MEE356T	Machine Diagnostics and Condition Monitoring	-	2	2.4	-	1	-	-	-	-	-	-	-	-	1.3	-
21MEE357T	Digital Signal and Image Processing	2	2.8	3	-	-	-	-	-	-	-	-	-	2.5	3	-
21MEE358T	Machine Learning Theory and Applications	-	1.8	2.2	-	1.8	-	-	-	-	-	-	-	-	2.6	-
21MEE359T	Artificial Intelligence Applications in Mechanical Engineering	-	2	3	3	-	-	-	-	-	-	-	-	2	3	-
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		2.8	2.5	2.4	2.9	2.1	3.0	1.8	3.0	2.4	3.0	3.0	2.6	2.1	2.2	2.8

40. (g) Implementation Plan: B.Tech. in Mechanical Engineering with Specialization in Artificial Intelligence and Machine Learning

Semester - I							Semester - II						
Course Code	Course Title	Hours / Week			C		Course Code	Course Title	Hours / Week			C	
		L	T	P					L	T	P		
21LEH101T	Communicative English	2	1	0	3		21LEH102T	Chinese					
21MAB101T	Calculus and Linear Algebra	3	1	0	4		21LEH103T	French					
21PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5		21LEH104T	German					
21MES102L ¹	Engineering Graphics and Design	0	0	4	2		21LEH105T	Japanese	2	1	0	3	
21EES101T	Electrical and Electronics Engineering	3	1	0	4		21LEH106T	Korean					
21CYM101T ¹	Environmental Science	1	0	0	0		21LEH107T	Spanish					
21PDM101L ¹	Professional Skills and Practices	0	0	2	0		21LEH108T	Russian					
21LEM101T ¹	Constitution of India	1	0	0	0		21GNH101J	Philosophy of Engineering	1	0	2	2	
Total Credits						18	21MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4	
Semester - III							21CYB101J	Chemistry	3	1	2	5	
Course Code	Course Title	Hours / Week			C		21MES101T	Engineering Mechanics	3	1	0	4	
		L	T	P			21CSS101J	Programming for Problem Solving	3	0	2	4	
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4		21BTB103T	Biology	2	0	0	2	
21MEC201T	Engineering Thermodynamics	3	0	0	3		21MES101L ¹	Basic Civil and Mechanical Workshop	0	0	4	2	
21MEC202T ²	Mechanics of Solids	3	1	0	4		21PDM102L ¹	General Aptitude	0	0	2	0	
21MEC203T	Engineering Materials and Metallurgy	3	0	0	3		21GNM101L ¹	Physical and Mental Health using Yoga					
21MEC204T	Manufacturing Processes and Metrology	3	0	0	3		21GNM102L ¹	National Service Scheme	0	0	2	0	
21MEC201L ¹	Manufacturing Processes and Metrology Laboratory	0	0	2	1		21GNM103L ¹	National Cadet Corps					
21MEC202L ¹	Material Testing Laboratory	0	0	2	1		21GNM104L ¹	National Sports Organization					
21PDH209T ¹	Social Engineering	2	0	0	2		Total Credits						26
21LEM201T ¹	Professional Ethics	1	0	0	0		Semester - IV						
21PDM201L ¹	Verbal Reasoning	0	0	2	0		Course Code	Course Title	Hours / Week			C	
21LEM202T ¹	Universal Human Values-II: Understanding Harmony and Ethical Human Conduct	2	1	0	3				L	T	P		
Total Credits						24	21MAB202T	Numerical Methods	3	1	0	4	
Semester - V							21CSC206T	Artificial Intelligence	2	1	0	3	
Course Code	Course Title	Hours / Week			C		21MEC205T ²	Fluid Mechanics and Machinery	3	0	0	3	
		L	T	P			21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3	
21MAB301T	Probability and Statistics	3	1	0	4		E	Professional Elective - I				3	
21MEC301T	Thermal Systems Engineering	3	1	0	4		21MEC203L ¹	Machine Dynamics Laboratory	0	0	2	1	
21MEC301P ¹	Design of Mechanical Systems	3	0	0	3		21MEC204L ¹	Fluid Dynamics Laboratory	0	0	2	1	
21MEC302T ²	Sensors and Control Systems	3	0	0	3		21MEC205L ¹	Mechanical Modeling and Assembly	0	0	4	2	
E	Professional Elective - II				3		21DCS201P ¹	Design Thinking and Methodology	1	0	0	3	
O	Open Elective - I				3		21PDM202L ¹	Critical and Creative Thinking Skills	0	0	2	0	
21MEC301L ¹	Thermal Power Systems Laboratory	0	0	2	1		Total Credits						23
21MEC302L ¹	Automation and Control Systems Laboratory	0	0	2	1		Semester - VI						
21PDM301L ¹	Analytical and Logical Thinking Skills	0	0	2	0		Course Code	Course Title	Hours / Week			C	
21LEM301T ¹	Indian Art Form	1	0	0	0				L	T	P		
21GNP301L ¹	Community Connect	0	0	2	1		21CSS303T	Data Science	2	0	0	2	
Total Credits						23	21MEC301J	Heat and Mass Transfer	3	0	2	4	
Semester - VII							21MEC302J ²	Finite Element Methods	3	0	2	4	
Course Code	Course Title	Hours / Week			C		21MEC303T	Industry 4.0	3	0	0	3	
		L	T	P			E	Professional Elective - III				3	
21GNH401TA	Behavioral Psychology	2	1	0	3		21MEP302L ¹	Project	0	0	6	3	
E	Professional Elective - IV				3		21MEP303T ¹	MOOC	3	0	0		
E	Professional Elective - V				3		O	Open Elective - II	3	0	0	3	
O	Open Elective - III				3		21PDM302L ¹	Employability Skills and Practices	0	0	2	0	
Total Credits						12	21LEM302T ¹	Indian Traditional Knowledge	1	0	0	0	
#Students have to register either 21MEP401L or 21MEP402L and 21MEP403L both in eighth semester							Total Credits						22
Semester - VIII							Semester - VIII						
Course Code	Course Title	Hours / Week			C		Course Code	Course Title	Hours / Week			C	
		L	T	P					L	T	P		
21MEP401L	Major Project	0	0	30	15		21MEP401L	Major Project	0	0	30	15	
21MEP402L	Major Project	0	0	20	10		21MEP402L	Major Project	0	0	20	10	
21MEP403L	Internship#	0	0	10	5		21MEP403L	Internship#	0	0	10	5	
							Total Credits						15