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

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

40. (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.*

40. (b) Program Educational Objectives (PEO)

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

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			
	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*	-
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	*Ability to analyse and implement AI techniques in mechanical engineering*
PSO - 2	*Ability to design and develop the contemporary programmable interfaces in mechanical systems*

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

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

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

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

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
21MEE351J	IoT Systems Design	2	0	2	3
21MEE352J	Programming for Machine Learning	2	0	2	3
21MEE353T	Mathematics for Machine Learning	3	0	0	3
21MEE354T	Soft Computing Techniques and Applications	3	0	0	3
21MEE355T	Artificial Neural Network	3	0	0	3
21MEE356T	Machine Diagnostics and Condition Monitoring	3	0	0	3
21MEE357T	Digital Signal and Image Processing	3	0	0	3
21MEE358T	Machine Learning Theory and Applications	3	0	0	3
21MEE359T	Artificial Intelligence Applications in Mechanical Engineering	3	0	0	3
				Total Credits	15

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**

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**

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**

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

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
O	Open Elective – I				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
E	Professional Elective – V				3
O	Open Elective – III				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

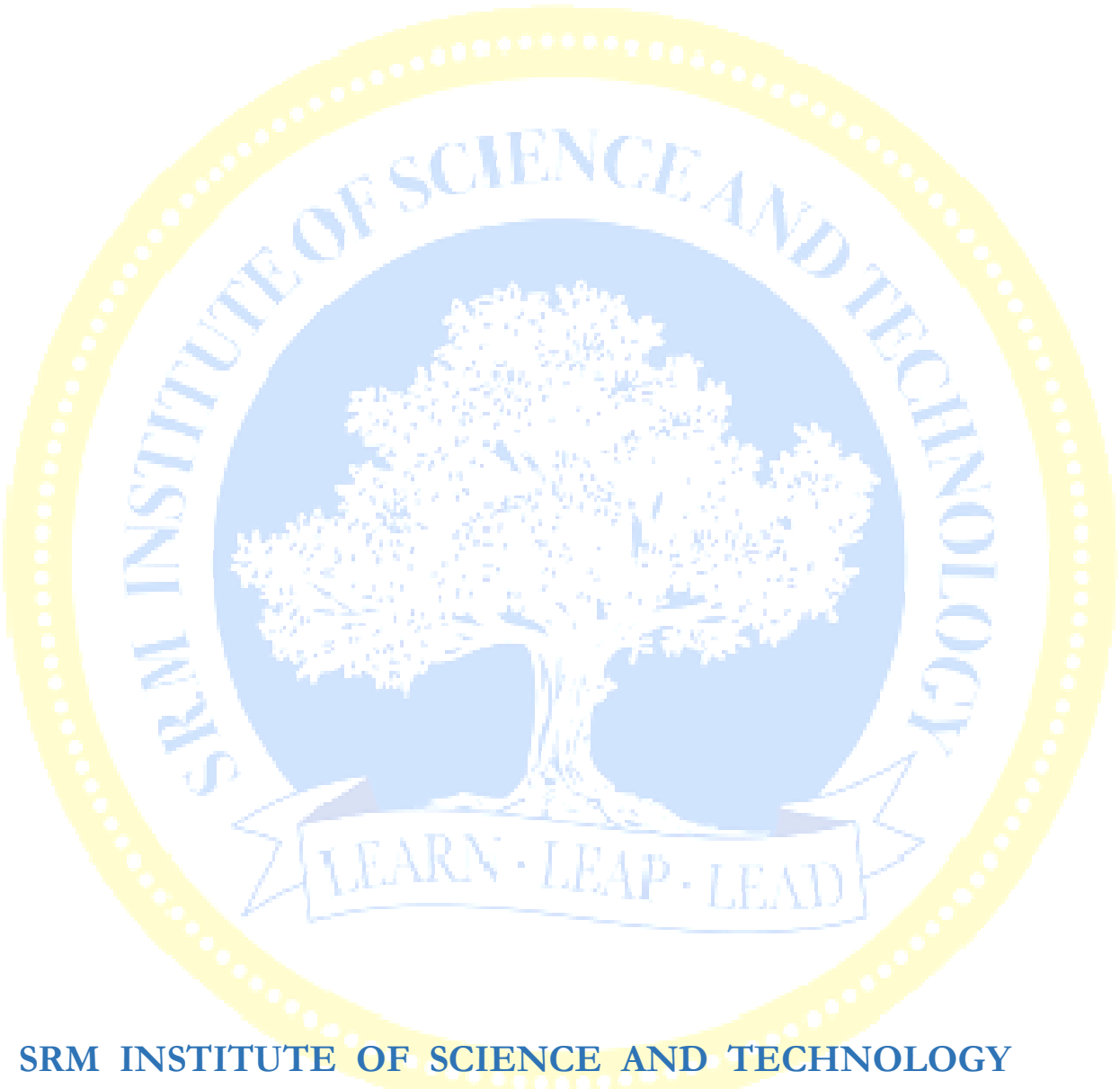
Course Code	Course Title	Hours / Week L	T	P	C
21MAB202T	Numerical Methods	3	1	0	4
21CSC206T	Artificial Intelligence	2	1	0	3
21MEC205T [2]	Fluid Mechanics and Machinery	3	0	0	3
21MEC206T	Kinematics and Dynamics of Machines	3	0	0	3
E	Professional Elective – I				3
21MEC203L [1]	Machine Dynamics Laboratory	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	0	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
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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