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

39. B.Tech. in Mechanical Engineering

39. (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.*

39. (b) Program Educational Objectives (PEO)

PEO – 1	*Practice mechanical engineering in different disciplines towards system design, realization, and manufacturing*
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*

39. (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

39. (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	*Apply contemporary technologies for sustainable development in mechanical engineering systems*
PSO - 2	*Ability to adopt appropriate tools and techniques to solve the problems in various domains of mechanical engineering.*

39. (e) Program Structure: B.Tech. in Mechanical Engineering

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 Abatement	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	9

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	

Project Work, Seminar, Internship in Industry / Higher Technical Institutions (P)					
Course Code	Course Title	Hours / Week			C
		L	T	P	
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

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			C
		L	T	P	
21MEE101T	Computer Aided Design- Computer Aided Manufacturing	3	0	0	3
21MEE102T	Composite Materials and Characterization	3	0	0	3
21MEE103T	Automation in Manufacturing Systems	3	0	0	3
21MEE104T	Energy Engineering and Management	3	0	0	3
21MEE105T	Solar Energy Systems	3	0	0	3
21MEE201T	Foundation skills in integrated product development	3	0	0	3
21MEE202T	Mechanical Vibrations	3	0	0	3
21MEE203T	Industrial Tribology	3	0	0	3
21MEE204T	Design for Manufacturing and Assembly	3	0	0	3
21MEE205T	Electric Vehicle Technology	3	0	0	3
21MEE206T	Biomechanics	3	0	0	3
21MEE207T	Operations Research	3	0	0	3
21MEE208T	Soft Computing Techniques and Applications in Mechanical Engineering	3	0	0	3
21MEE209T	Process Planning and Cost Estimation	3	0	0	3
21MEE210T	Mechatronics System Design	3	0	0	3
21MEE211T	Soft Robotics	3	0	0	3
21MEE212T	Heating, Ventilation and Air Conditioning Systems	3	0	0	3

Professional Elective Courses (E)					
Course Code	Course Title	Hours / Week			C
		L	T	P	
21MEE213T	Emerging Technologies in Automotive Systems	3	0	0	3
21MEE214T	Gas Dynamics and Space Propulsion	3	0	0	3
21MEE215T	Computational Fluid Dynamics: Theory with Applications	3	0	0	3
21MEE216T	Modeling and Analysis of Thermal Systems	2	1	0	3
21MEE217J	Microelectronics Thermal Management.	2	0	2	3
21MEE218T	Aerodynamics of Electric and Sports Vehicles	3	0	0	3
21MEE219T	Green Energy Systems	3	0	0	3
21MEE301T	Optimization in Engineering Design	3	0	0	3
21MEE302T	Design of transmission Systems	3	0	0	3
21MEE303T	Micro and Nano Machining	3	0	0	3
21MEE304T	Machine Vision	3	0	0	3
21MEE305T	Quality Management Systems	3	0	0	3
21MEE306T	Energy Conversion Systems	3	0	0	3
21MEE307T	Sustainable and Renewable Energy Systems	3	0	0	3
21MEE308T	Sustainable Waste Management	3	0	0	3
				Total Credits	15

39. (f) Programme Articulation: B.Tech. in Mechanical Engineering

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	
21MEE101T	Computer Aided Design - Computer Aided Manufacturing		2	2		1.8									1.5	
21MEE102T	Composite Materials and Characterization	2.2	1.5	3				2						2.3	2.5	
21MEE103T	Automation in Manufacturing Systems		3	3		2.3								2	2	
21MEE104T	Energy Engineering and Management				1			3						1.8		
21MEE105T	Solar Energy Systems	3	2					3						3		
21MEE201T	Foundation Skills in Integrated Product Development			3	1									2		
21MEE202T	Mechanical Vibrations	3	2.8												3	
21MEE203T	Industrial Tribology	1	3					2						2.5	2	
21MEE204T	Design for Manufacturing and Assembly	2	1	1											2.7	
21MEE205T	Electric Vehicle Technology	2						2	3					2		
21MEE206T	Biomechanics	2.6						2					2	2.2		
21MEE207T	Operations Research		1	3		1						3			3	
21MEE208T	Soft Computing Techniques and Applications in Mechanical Engineering	2.6			3	3									2.3	
21MEE209T	Process Planning and Cost Estimation	1	2.6		2			1							2.8	
21MEE210T	Mechatronics System Design		2	3	1										2.3	
21MEE211T	Soft Robotics	3	2.8	3										2	2.25	
21MEE212T	Heating, Ventilation and Air Conditioning Systems	2.8	2.5					3						2.6		
21MEE213T	Emerging Technologies in Automotive Systems							3						3		
21MEE214T	Gas Dynamics and Space Propulsion	1.6	1.6												1	
21MEE215T	Computational Fluid Dynamics: Theory with Applications	2.5	2.5			2									2. 7	
21MEE216T	Modeling and Analysis of Thermal Systems	3						3						3		
21MEE217J	Microelectronics Thermal Management	3		3	1	3									1.4	
21MEE218T	Aerodynamics of Electric and Sports Vehicles	2.6													1.8	
21MEE219T	Green Energy Systems		3					2						3		
21MEE301T	Optimization in Engineering Design	3	3	3											2.6	
21MEE302T	Design of transmission Systems	2		3											3	
21MEE303T	Micro and Nano Machining	3			1.4	2									2	
21MEE304T	Machine Vision		2.8		2.5	2.5						3	3		2	
21MEE305T	Quality Management Systems	3	3	2.5		3	2. 3			3		3	3	3	1. 3	

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
21MEE306T	*Energy Conversion Systems*	*3*						*3*				*3*		*2. 3*		
21MEE307T	*Sustainable and Renewable Energy Systems*	*3*						*2.4*						*3*		
21MEE308T	*Sustainable Waste Management*	*2.8*						*2. 7*	*2*					*2. 7*		
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		*2.6*	*2.4*	*2.5*	*2.3*	*2.3*	*3.0*	*2.2*	*2.8*	*2.5*	*3.0*	*3.0*	*2.9*	*2.4*	*2.3*	

39. (g) Implementation Plan: B.Tech. in Mechanical Engineering

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
	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
	Professional Elective – IV				3
	Professional Elective – V				3
O	Open Elective – III				3
				Total Credits	12

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	2	0	3
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	0
				Total Credits	23

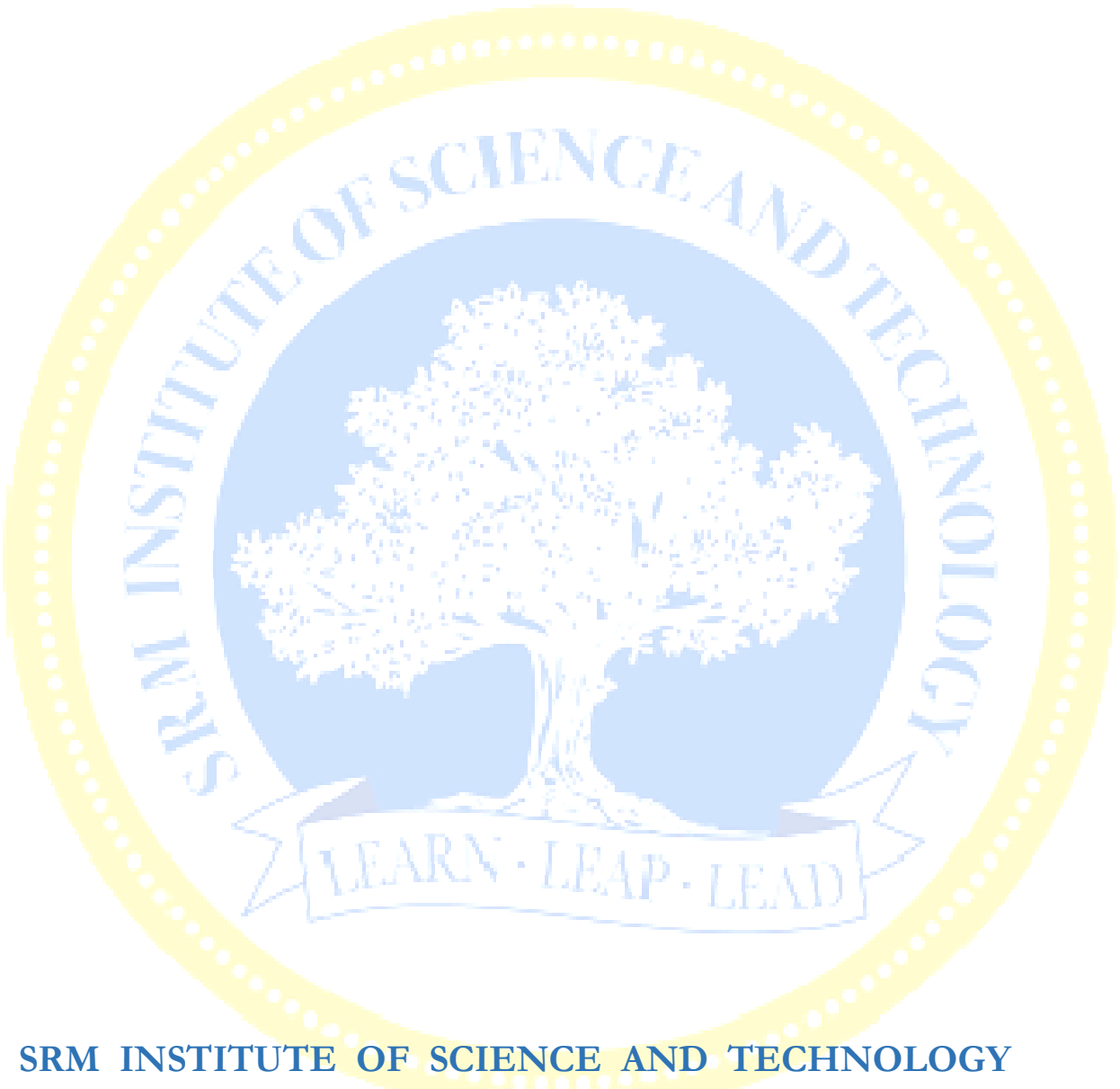
Semester – VI

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
	Professional Elective – III				3
21MEP302L [1]	Project	0	0	6	3
21MEP303T [1]	MOOC	3	0	0	
O	Open Elective – II				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

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



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India