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

42. B.Tech. in Mechatronics Engineering

42. (a) Mission of the Department

Mission Stmt – 1	*To impart the principles of Mechatronics Engineering to produce engineers who are capable of competing on the global stage.*
Mission Stmt – 2	*To excel at solving multidisciplinary challenges through structured teaching-learning methods and by providing state-of-the-art facilities.*
Mission Stmt – 3	*To cultivate future leaders with a strong sense of integrity, communication, teamwork, and entrepreneurship*

42. (b) Program Educational Objectives (PEO)

PEO – 1	*Graduates will demonstrate a commitment to lifelong learning and career growth through participation and leadership in professional societies and organizations*
PEO – 2	*Graduates will advance professionally with a competency to solve challenges in industry, research, and academia leading to sustainable development of the society*
PEO – 3	*Graduates will be capable of solving ever-evolving-complex-system-integration problems through inter-disciplinary approaches.*
PEO – 4	*Graduates will be versatile in dealing with systems from a variety of modern engineering and technology fields with ease.*

42. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

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

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

42. (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	-	-	-	-	-	1	1	2	-	2	-	-	-	3	-
PEO - 2	3	-	-	3	3	3	3	3	2	2	3	-	3	2	3
PEO - 3	3	3	3	3	3	2	1	-	3	3	2	1	3	2	-
PEO - 4	3	3	2	1	3	1	-	-	1	1	-	-	2	2	2

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

PSO – Program Specific Outcomes (PSO)

PSO - 1	*Graduates will apply scientific principles for modelling and simulation of multi-disciplinary engineering systems*
PSO - 2	*Graduates will be able to interpret specifications of elements to design and develop an integrated system*
PSO - 3	*Graduates will be able to control Mechatronics and automation systems using modern programming tools*

42. (e) Program Structure: B.Tech. in Mechatronics Engineering

Humanities & Social Sciences including Management Courses (H)

Course Code	Course Title	L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21LEH102T	Chinese				
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese	2	1	0	3
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	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
21MHS201T	Thermodynamics and Heat Transfer	3	0	0	3
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
21CSS303T	Data Science	2	0	0	2
	Total Credits				**20**

Non Credit Courses (M)

Course Code	Course Title	L	T	P	C
21PDM101L [1]	Professional Skills and Practices	0	0	2	
21PDM102L [1]	General Aptitude	0	0	2	
21PDM201L [1]	Verbal Reasoning	0	0	2	
21PDM202L [1]	Critical and Creative Thinking Skills	0	0	2	0
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				
21GNM102L [1]	National Service Scheme	0	0	2	0
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
	Total Credits				**03**

Open Elective Courses (O)
(Any 3 Course)

Course Code	Course Title	L	T	P	C
21MHO301T	Smart Farming	3	0	0	3
	Total Credits				**03**

Basic Science Courses (B)

Course Code	Course Title	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
21PYB104J	Physics: Mechanics	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	L	T	P	C
21MHC101P [1]	Elements of Mechatronics Systems	2	1	0	3
21MHC201T	Electrical actuators and Drives	3	0	0	3
21MHC202J	Analog and Digital Electronics	2	0	2	3
21MHC203J	Fluid power system and Automation	2	0	2	3
21MHC204L [1]	Electrical Actuators and Drives Laboratory	0	0	2	1
21MHC205T	Microcontroller and Embedded Systems	3	0	0	3
21MHC206T	Mechanics of Solids and Fluids	3	0	0	3
21MHC207L [1]	Microcontroller and Embedded Systems Laboratory	0	0	2	1
21MHC208L [1]	Mechanics of Solids and Fluids Laboratory	0	0	2	1
21MHC209T	Project Management and Industrial Practices	2	1	0	3
21CSC206T	Artificial Intelligence	2	1	0	3
21MHC301T	System Dynamics and Control	3	0	0	3
21MHC302J	Design and Analysis of Machine Elements	2	0	2	3
21MHC303J	Measurement, Sensors and Interfaces	2	0	2	3
21MHC304L [1]	Modelling and Control Laboratory	0	0	2	1
21MHC305J	Manufacturing Processes	2	0	2	3
21MHC306T	Kinematic Analysis and Dynamics of Mechanisms	3	0	0	3
21MHC307P [1]	Model Based Systems Engineering	1	2	0	3
	Total Credits				**46**

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

Course Code	Course Title	L	T	P	C
21GNP301L [1]	Community Connect	0	0	2	1
21MHP302L [1]	Project	0	0	6	3
21MHP303T [1]	MOOC	3	0	0	
21MHP401L	Major Project	0	0	30	15
21MHP402L	Major Project	0	0	20	10
21MHP403L	Internship#	0	0	10	5
	Total Credits				**19**

Professional Elective Courses (E) *(Any 7 Courses)*						Professional Elective Courses (E)					
Course Code	Course Title	Hours / Week				Course Code	Course Title	Hours / Week			
		L	T	P	C			L	T	P	C
Professional Elective -1						*Professional Elective - 5*					
21MHE401T	Fundamentals of Robotics	3	0	0	3	21MHE413T	Condition Monitoring Techniques	3	0	0	3
21MHE402L [1]	Visual Computing Laboratory	0	0	5	3	21MHE414T	Advanced Control Systems	3	0	0	3
21MHE403T	Industrial Electronics	3	0	0	3	21MHE415T	Micro Electro Mechanical Systems	3	0	0	3
Professional Elective - 2						*Professional Elective - 6*					
21MHE404T	Robot Kinematics and Dynamics	3	0	0	3	21MHE416T	Geometric Modelling	3	0	0	3
21MHE405L [1]	Neural Networks and Deep Learning Laboratory	0	0	5	3	21MHE417T	Industrial Automation	3	0	0	3
						21MHE418L [1]	Robotics Laboratory	0	0	5	3
21MHE406T	Virtual Instrumentation	3	0	0	3	*Professional Elective - 7*					
Professional Elective - 3						21MHE419T	Digital Manufacturing	3	0	0	3
21MHE407T	Autonomous Mobile Robotics	3	0	0	3	21MHE420T	Energy Harvesting methods and applications	3	0	0	3
21MHE408L [1]	Measurement and Data Acquisition Laboratory	0	0	5	3	21MHE421T	Ergonomic Design	3	0	0	3
						21MHE422T	Industrial Data Communication	3	0	0	3
21MHE409T	Advanced Microcontrollers and Signal Processors	3	0	0	3	21MHE423T	Digital Signal Processing	3	0	0	3
Professional Elective - 4						**Total Credits**					**21**
21MHE410T	Machine Vision and Image Processing	3	0	0	3						
21MHE411T	Applied Mechatronics Systems	3	0	0	3						
21MHE412T	Real Time Embedded Systems	3	0	0	3						
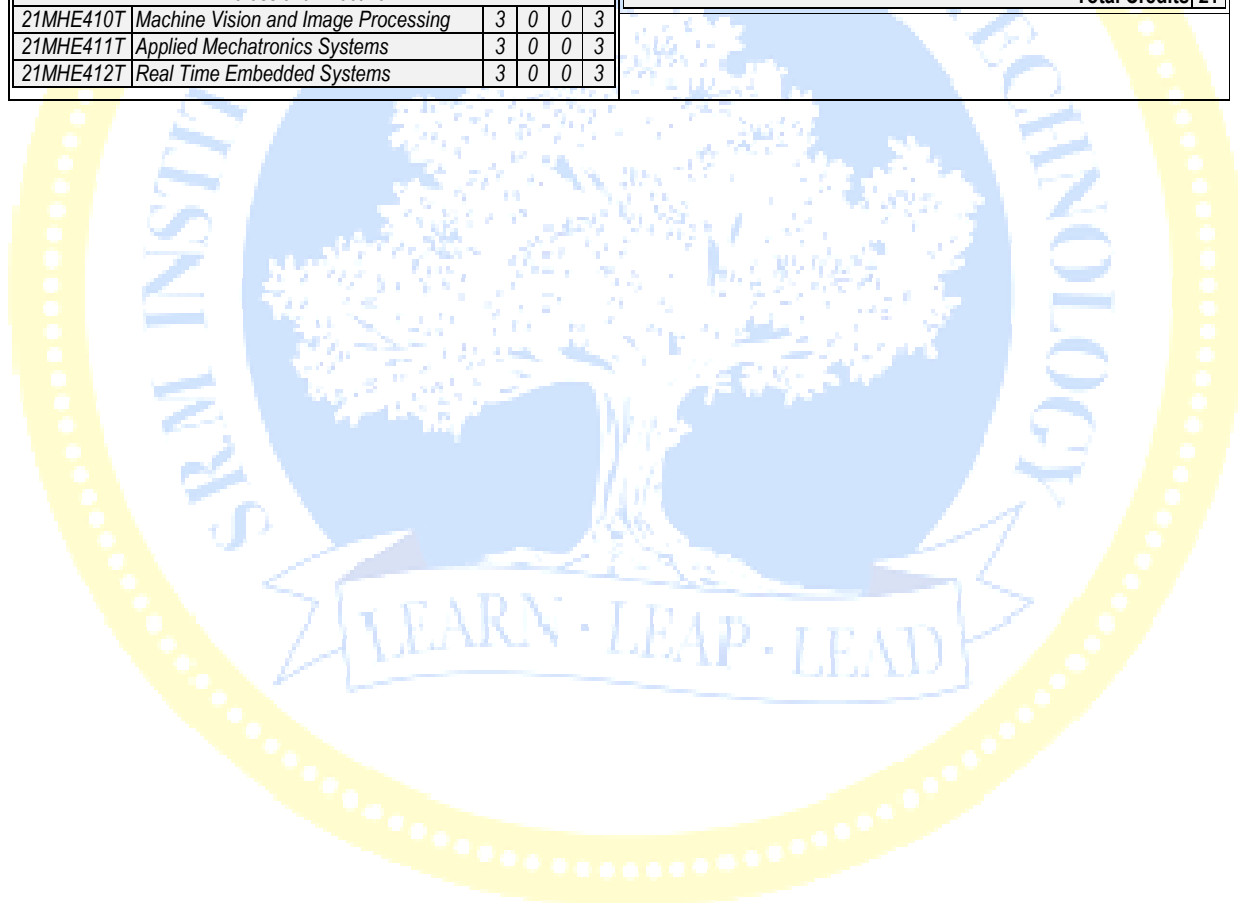
42. (f) Programme Articulation: B.Tech. in Mechatronics Engineering

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
21MHS201T	Thermodynamics and Heat Transfer	1	2			2										
21MHC101P	Elements of Mechatronics Systems	3	3													
21MHC201T	Electrical Actuators and Drives	3	2	2											1	2
21MHC202J	Analog and Digital Electronics	3	2	2											2	
21MHC203J	Fluid Power System and Automation	3	2	2		1									1	2
21MHC204L	Electrical Actuators and Drives Laboratory	3	2	2												
21MHC205T	Microcontroller and Embedded Systems	3		2		1										2
21MHC206T	Mechanics of Solids and Fluids	3	3	2												
21MHC208L	Mechanics of Solids and Fluids Laboratory	3	3	2												
21MHC207L	Microcontroller and Embedded Systems Laboratory	3	1	2		1										2
21MHC209T	Project Management and Industrial Practices					2						3		1		
21CSC206T	Artificial Intelligence															
21MHC301T	System Dynamics and Control	3	2	2										3		2
21MHC302J	Design and Analysis of Machine Elements	3	3	2		2								2	2	
21MHC303J	Measurement, Sensors and Interfaces	3	1	2										1		
21MHC304L	Modelling and Control Laboratory	2	2	3		2								3		2
21MHC305J	Manufacturing Processes	3	2	1												
21MHC306T	Kinematic Analysis and Dynamics of Mechanisms	1	2			3										
21MHC307P	Model Based Systems Engineering	3	3		2	1								2	2	
21MHE401T	Fundamentals of Robotics	3	2	2										2	2	
21MHE402L	Visual Computing Laboratory		3	3		2								2	2	
21MHE403T	Industrial Electronics	3	2	2										2	2	
21MHE404T	Robot Kinematics and Dynamics	3	3	2										2	2	
21MHE405L	Neural Networks and Deep Learning Laboratory	3	2			2								2		2
21MHE406T	Virtual Instrumentation	3	2	3										2	2	
21MHE407T	Autonomous Mobile Robotics	3	2		2									2	2	
21MHE408L	Measurement and Data Acquisition Laboratory	3		2		3									2	
21MHE409T	Advanced Microcontrollers and Signal Processors	2				1										
21MHE410T	Machine Vision and Image Processing	2	2	2		1								2	2	
21MHE411T	Applied Mechatronics Systems	3	2	3		3								2	2	
21MHE412T	Real Time Embedded Systems	1	3	3										2	2	
21MHE413T	Condition Monitoring Techniques	3	3	2		3								2	2	
21MHE414T	Advanced Control Systems	3	2	3		2								3		2
21MHE415T	Micro Electromechanical Systems	3	3		2									2	2	
21MHE416T	Geometric Modelling	3	3	2		2										
21MHE417T	Industrial Automation	3	2			2								2	2	
21MHE418L	Robotics Laboratory	3	3			3								2	2	
21MHE419T	Digital Manufacturing	3	3		2									2	2	
21MHE420T	Energy Harvesting Methods and Applications	3	2	1										2	2	
21MHE421T	Ergonomic Design	3	1			2										
21MHE422T	Industrial Data Communication	3													1	1
21MHE423T	Digital Signal Processing	3	2			2									2	
	Program Average	2.75	2.28	2.15	2	1.95						3		2.04	1.90	2

42. (g) Implementation Plan: B.Tech. in Mechatronics Engineering

Semester - I

Course Code	Course Title	L	T	P	C
21LEH101T	Communicative English	2	1	0	3
21MAB101T	Calculus and Linear Algebra	3	1	0	4
21PYB104J	Physics :Mechanics	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 - II

Course Code	Course Title	L	T	P	C
21LEH102T	Chinese				
21LEH103T	French				
21LEH104T	German				
21LEH105T	Japanese	2	1	0	3
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
21MHC101P [1]	Elements of Mechatronics systems	2	1	0	3
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				
21GNM102L [1]	National Service Scheme	0	0	2	0
21GNM103L [1]	National Cadet Corps				
21GNM104L [1]	National Sports Organization				
	Total Credits				**25**

Semester - III

Course Code	Course Title	L	T	P	C
21MAB201T	Transforms and Boundary Value Problems	3	1	0	4
21MHC201T	Electrical Actuators and Drives	3	0	0	3
21MHC202J	Analog and Digital Electronics	2	0	2	3
21MHC203J	Fluid power system and Automation	2	0	2	3
21PDH209T [1]	Social Engineering	2	0	0	2
21MHS201T	Thermodynamics and Heat Transfer	3	0	0	3
21MHC204L [1]	Electrical Actuators and Drives Laboratory	0	0	2	1
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				**22**

Semester - IV

Course Code	Course Title	L	T	P	C
21MAB202T	Numerical methods	3	1	0	4
21CSC206T	Artificial Intelligence	2	1	0	3
21MHC205T	Microcontroller and Embedded Systems	3	0	0	3
21MHC206T	Mechanics of Solids and Fluids	3	0	0	3
21MHC207L [1]	Microcontroller and Embedded Systems Laboratory	0	0	2	1
21MHC208L [1]	Mechanics of Solids and Fluids Laboratory	0	0	2	1
21MHC209T	Project Management and Industrial Practices	2	1	0	3
21DCS201P [1]	Design Thinking and Methodology	1	2	0	3
	Professional Elective – I	3	0	0	3
21PDM202L [1]	Critical and Creative Thinking Skills*	0	0	2	0
	Total Credits				**24**

Semester - V

Course Code	Course Title	L	T	P	C
21MAB301T	Probability and Statistics	3	1	0	4
21MHC301T	System Dynamics and Control	3	0	0	3
21MHC303J	Measurement, Sensors and Interfaces	2	0	2	3
21MHC302J	Design and Analysis of Machine Elements	2	0	2	3
	Professional Elective – II	3	0	0	3
	Open Elective – I	3	0	0	3
21MHC304L [1]	Modelling and Control 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				**21**

Semester - VI

Course Code	Course Title	L	T	P	C
21CSS303T	Data Science	2	0	0	2
21MHC305J	Manufacturing Processes	2	0	2	3
21MHC306T	Kinematic Analysis and Dynamics of Mechanisms	3	0	0	3
21MHC307P [1]	Model Based Systems Engineering	1	2	0	3
	Professional Elective – III	3	0	0	3
21MHP302L [1]	Project	0	0	6	3
21MHP303T [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				**20**

Semester - VII

Course Code	Course Title	L	T	P	C
21GNH401T	Behavioural Psychology	2	1	0	3
	Professional Elective – IV	3	0	0	3
	Professional Elective – V	3	0	0	3
	Professional Elective – VI				3
	Professional Elective – VII				3
O	Open Elective – III	3	0	0	3
	Total Credits				**18**

	Semester - VIII				
#Students have to register either 21MHP401L or 21MHP402L and 21MHP403L both in eighth semester	Course Code	Course Title	Hours / Week		
			L	T	P	C

Course Code	Course Title	L	T	P	C
21MHP401L	Major Project	0	0	30	15
21MHP402L	Major Project	0	0	20	10
21MHP403L	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)

Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India