ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMMES

Bachelor of Technology

(B.Tech. - Four Years)

(Choice Based Flexible Credit System)

Regulations 2018

Volume - 1

(Revised in March 2019)

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Kancheepuram District 603203, Tamil Nadu, India

28. B.Tech. in Mechanical Engineering

28. (a) Mission of the Department

Mission Stmt - 1	*To impart quality education to produce mechanical engineers and enhance their skills to become world renowned professionals*
Mission Stmt - 2	*To establish Centres of Research Excellence to inculcate research acumen in faculty and students on the areas like; machining, bio-mechanics, bio-fuels, composites, and energy*
Mission Stmt - 3	*To provide state-of-the-art education and training programs to the faculty and student fellowship*

28. (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	*Solve industrial, social, and environmental problems with appropriate techniques and tools*
PEO - 4	*Work in large cross-functional teams and pursue life-long learning*

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

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3
PEO - 1	*H*	*H*	*H*
PEO - 2	*H*	*H*	*M*
PEO - 3	*H*	*H*	*H*
PEO - 4	*M*	*M*	*H*

H – High Correlation, M – Medium Correlation, L – Low Correlation

28. (d) Mapping Program Educational Objectives (PEO) to Program Learning Outcomes (PLO)

	Program Learning Outcomes (PLO)														
	Graduate Attributes (GA)												Program Specific Outcomes (PSO)		
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
PEO - 1	*H*	*H*	*H*	*H*	*M*	*M*	*L*	*H*	*H*	*H*	*L*	*H*	*H*	*H*	*H*
PEO - 2	*H*	*H*	*M*	*M*	*L*	*H*	*H*	*H*	*H*	*L*	*L*	*M*	*H*	*H*	*L*
PEO - 3	*M*	*M*	*M*	*M*	*H*	*H*	*H*	*H*	*L*	*M*	*H*	*H*	*H*	*L*	*M*
PEO - 4	*H*	*M*	*M*	*M*	*M*	*H*	*M*	*M*	*H*	*H*	*H*	*H*	*M*	*H*	*H*

H – High Correlation, M – Medium Correlation, L – Low Correlation

PSO – Program Specific Outcomes (PSO)

PSO - 1	*Ability to Develop and implement new ideas on product design and development with the help of modern computer aided tools, while ensuring best manufacturing practices*
PSO - 2	*Ability to apply engineering knowledge and design & analysis tools to solve problems in the domains of structural, thermal and fluid mechanics.*
PSO - 3	*Engage professionally in industries or as an entrepreneur by applying manufacturing and management practices.*

28. (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
18LEH101J	English	2	0	2	3
18LEH102J	Chinese				
18LEH103J	French				
18LEH104J	German	2	0	2	3
18LEH105J	Japanese				
18LEH106J	Korean				
18PDH101T	General Aptitude	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDH103T	Social Engineering	2	0	0	2
18PDH201T	Employability Skills & Practices	0	0	2	1
	Total Learning Credits				**12**

Engineering Science Courses (S)

Course Code	Course Title	Hours/ Week L	T	P	C
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
18MES104L	Active Learning Laboratory	0	0	2	1
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18CSS101J	Programming for Problem Solving	3	0	4	5
18MES201T	Engineering Mechanics	3	1	0	4
	Total Learning Credits				**21**

Open Elective Courses (O)
(Any 4 Open Elective Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
18MEO101T	Robotics Engineering and Applications	3	0	0	3
18MEO102T	Alternative Sources of Energy	3	0	0	3
18MEO103T	Energy Systems For Buildings	3	0	0	3
18MEO104T	Operations Research	3	0	0	3
18MEO105T	Materials Management	3	0	0	3
18MEO106T	Environmental Pollution and Abatement	3	0	0	3
18MEO107T	Nano Robotics	3	0	0	3
18MEO108T	Automatic Control Systems	3	0	0	3
18MEO109T	Neural Network and Fuzzy Systems	3	0	0	3
18MEO110T	Robotic Sensors	3	0	0	3
18MEO111T	Industrial Engineering	3	0	0	3
18MEO112T	Production Management	3	0	0	3
18MEO113T	Design of Experiments	3	0	0	3
18MEO114T	Modern Control Theory	3	0	0	3
18MEO115T	Facilities Planning	3	0	0	3
18MEO116T	Industrial Safety and Environment	3	0	0	3
18MEO117T	Artificial Intelligence and Expert Systems	3	0	0	3
18MEO118T	Micro Controller and Its Application in Robotics	3	0	0	3
18MEO119T	Machinery Fault Diagnostics&Signal Processing	3	0	0	3
18MEO120T	Digital Image Processing and Machine Vision	3	0	0	3
18MEO121T	Multidisciplinary Design	3	0	0	3
	Total Learning Credits				**12**

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

Course Code	Course Title	Hours/ Week L	T	P	C
18MEP101L	Massive Open Online Course - I				
18MEP102L	Industrial Training-I	0	0	2	1
18MEP103L	Seminar - I				
18MEP104L	Massive Open Online Course - II				
18MEP105L	Industrial Training-II	0	0	2	1
18MEP106L	Seminar - II				
18MEP107L	Minor Project	0	0	6	3
18MEP108L	Internship (4-6 weeks)				
18MEP109L	Project	0	0	20	10
18MEP110L	Semester Internship				
	Total Learning Credits				**15**

Basic Science Courses (B)

Course Code	Course Title	Hours/ Week L	T	P	C
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18CYB101J	Chemistry	3	1	2	5
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
18PYB201T	Waves and Optics	3	1	0	4
	Total Learning Credits				**32**

Professional Core Courses (C)

Course Code	Course Title	Hours/ Week L	T	P	C
18MEC101T	Thermodynamics	3	1	0	4
18MEC102T	Fluid Mechanics	3	1	0	4
18MEC103T	Manufacturing Technology	3	1	0	4
18MEC104L	Fluid Dynamics Laboratory	0	0	2	1
18MEC105L	Manufacturing Process Laboratory	0	0	2	1
18MEC106T	Mechanics of Solids	3	1	0	4
18MEC107T	Applied Thermal Engineering	3	1	0	4
18MEC108T	Materials Technology	3	0	0	3
18MEC109L	Strength of Materials Laboratory	0	0	2	1
18MEC110L	Heat Power Laboratory	0	0	2	1
18MEC111L	Materials Technology Laboratory	0	0	2	1
18MEC201T	Machines and Mechanisms	3	1	0	4
18MEC202T	Heat and Mass Transfer	3	1	0	4
18MEC203L	Machine Dynamics Laboratory	0	0	2	1
18MEC204L	Simulation Laboratory	0	0	2	1
18MEC205L	Heat and Mass Transfer Laboratory	0	0	2	1
18MEC206T	Metrology and Quality Control	3	0	0	3
18MEC207T	CAD/CAM	3	0	0	3
18MEC208T	Mechanical Engineering Design	3	1	0	4
18MEC209L	CAD / CAM Laboratory	0	0	2	1
18MEC210L	Automation Laboratory	0	0	2	1
18MEC211L	Metrology and Quality Control Laboratory	0	0	2	1
18MEC350T	Comprehension	0	1	0	1
	Total Learning Credits				**53**

Mandatory Courses (M)

Course Code	Course Title	Hours/ Week L	T	P	C
18PDM101L	Professional Skills and Practices	0	0	2	0
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM101T	Constitution of India	1	0	0	0
18LEM102J	Value Education	1	0	1	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
18LEM109T	Indian Traditional Knowledge	1	0	0	0
18LEM110L	Indian Art Form	0	0	2	0
18CYM101T	Environmental Science	1	0	0	0

Professional Elective Courses (E) (Any 5 Elective Courses)						
Course Code	Course Title	Hours/ Week L	T	P	C	
Sub-Stream : Design						
18MEE301T	Fundamentals of Vibration and Noise	3	0	0	3	
18MEE302T	Industrial Tribology	3	0	0	3	
18MEE303T	Mechanism Design, Analysis and Synthesis	3	0	0	3	
18MEE304T	Design for Manufacturing and Assembly	3	0	0	3	
18MEE305T	Finite Element Method	3	0	0	3	
18MEE306T	Advanced Strength of Materials	3	0	0	3	
18MEE307T	Automotive Engineering	3	0	0	3	
18MEE308T	Foundation Skills in Integrated Product Development	3	0	0	3	
18MEE309T	Modeling Systems	3	0	0	3	
18MEE310T	Human Body Mechanics	3	0	0	3	
18MEE401T	Design of Transmission Systems	3	0	0	3	
18MEE402T	Optimization in Engineering Design	3	0	0	3	
18MEE403T	Tool Engineering Design	3	0	0	3	
18MEE404T	Computer Graphics	3	0	0	3	
18MEE405T	Fatigue, Fracture Mechanics and Creep	3	0	0	3	
18MEE406T	Linear Elasticity	3	0	0	3	
18MEE407T	Design of Pressure Vessel and Piping	3	0	0	3	
18MEE408T	Kinematics and Dynamics Of Robots	3	0	0	3	
18MEE409T	Computer Applications in Design	3	0	0	3	
Sub-Stream : Manufacturing						
18MEE321T	Elements of Mechatronics	3	0	0	3	
18MEE322T	Fluid Power Control	3	0	0	3	
18MEE323T	Process Planning and Cost Estimation	3	0	0	3	
18MEE324T	Foundry Engineering	3	0	0	3	
18MEE325T	Theory of Metal Forming	3	0	0	3	
18MEE326T	Welding Technology	3	0	0	3	
18MEE327T	Mechanical Handling Systems and Equipment	3	0	0	3	
18MEE328T	Non-Traditional Machining Techniques	3	0	0	3	
18MEE329T	Modern Manufacturing Techniques	3	0	0	3	
18MEE330T	Flexible Manufacturing Systems	3	0	0	3	
18MEE421T	Sustainable Green Manufacturing	3	0	0	3	
18MEE422T	Additive Manufacturing Technology	3	0	0	3	
18MEE423T	Precision Engineering	3	0	0	3	
18MEE424T	Technology of Surface Coating	3	0	0	3	
18MEE425T	Supply Chain Management	3	0	0	3	
18MEE426T	Composite Materials and Mechanics	3	0	0	3	
18MEE427T	Global Optimization Algorithms	3	0	0	3	
18MEE428T	Simulation of Mechanical Systems	3	0	0	3	
18MEE429T	Industry 4.0	3	0	0	3	
18MEE430T	TQM and Reliability Engineering	3	0	0	3	
18MEE431T	Design of Jigs, Fixtures and Press Tools	3	0	0	3	
Sub-Stream : Thermal						
18MEE341T	Refrigeration and Air Conditioning Systems	3	0	0	3	
18MEE342T	Internal Combustion Engines	3	0	0	3	
18MEE343T	Elements of Space Technology	3	0	0	3	
18MEE344T	Energy Engineering and Management	3	0	0	3	
18MEE345T	Turbomachines	3	0	0	3	
18MEE346T	Thermal Power Systems	3	0	0	3	
18MEE347T	Solar Energy Systems	3	0	0	3	
18MEE348T	Gas Turbine Technology	3	0	0	3	
18MEE349T	Solar Energy Utilization	3	0	0	3	
18MEE350T	Gas Dynamics And Space Propulsion	3	0	0	3	
18MEE441T	Computational Fluid Dynamics	3	0	0	3	
18MEE442T	Advanced Engineering Thermodynamics	3	0	0	3	
18MEE443T	Advanced Fluid Mechanics	3	0	0	3	
18MEE444T	Design of Pumps and Turbines	3	0	0	3	
18MEE445T	Thermal Energy Storage Systems	3	0	0	3	
18MEE446T	Design of Heat Exchangers	3	0	0	3	
18MEE447T	Combustion Engineering	3	0	0	3	
18MEE448T	Sustainable Energy Systems	3	0	0	3	
18MEE449T	Fuel Cell Technology	3	0	0	3	
18MEE450T	Modeling of Thermal Systems	3	0	0	3	

28. (f) Program Articulation: B.Tech. in Mechanical Engineering

Course Code	Course Name	Program Learning Outcomes (PLO)													
		Graduate Attributes											PSO		
		Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO - 3
18MES101L	Engineering Graphics and Design	H	H	M	M	L	L	L	L	L	L	L	H	M	M	M
18MES102J	Basic Civil and Mechanical Engineering	H	H	M	M	M	L	L	L	L	L	L	H	M	M	M
18MES103L	Civil and Mechanical Engineering Workshop	H	H	M	M	M	L	M	M	L	M	L	H	M	M	L
18MES104L	Active Learning Laboratory	H	M	M	M	M	L	M	L	M	M	L	H	H	H	H
18MES201T	Engineering Mechanics	H	M	M	M	M	L	M	L	M	M	M	H	H	H	H
18MEC101T	Thermodynamics	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
18MEC102T	Fluid Mechanics	H	H	H	H	M	L	L	L	M	L	M	H	L	H	L
18MEC103T	Manufacturing Technology	H	H	M	H	M	L	M	M	L	L	M	H	M	L	M
18MEC104L	Fluid Dynamics Laboratory	H	H	H	H	M	L	L	L	M	M	M	M	L	L	L
18MEC105L	Manufacturing Process Laboratory	H	H	H	H	M	L	L	L	H	L	M	H	H	H	L
18MEC106T	Mechanics of Solids	H	H	M	H	M	L	M	M	L	L	M	H	M	L	M
18MEC107T	Applied Thermal Engineering	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
18MEC108T	Materials Technology	H	H	H	H	M	M	M	L	L	L	M	M	L	L	L
18MEC109L	Strength of Materials Laboratory	H	H	H	H	M	L	M	L	H	L	M	H	M	H	L
18MEC110L	Heat Power Laboratory	H	H	M	H	M	L	L	L	M	M	M	H	M	M	L
18MEC111L	Materials Technology Laboratory	H	H	M	M	H	H	H	L	M	L	L	H	H	M	M
18MEC201T	Machines and Mechanisms	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
18MEC202T	Heat and Mass Transfer	H	H	M	M	M	L	L	L	M	M	H	M	M	M	M
18MEC203L	Machine Dynamics Laboratory	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
18MEC204L	Simulation Laboratory	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
18MEC205L	Heat and Mass Transfer Laboratory	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
18MEC206T	Metrology and Quality Control	H	H	H	H	M	M	H	M	M	M	H	H	M	M	H
18MEC207T	CAD/CAM	H	H	H	H	L	M	H	L	L	L	L	H	M	M	H
18MEC208T	Mechanical Engineering Design	H	H	H	H	L	M	H	L	L	L	L	H	H	M	M
18MEC209L	CAD / CAM Laboratory	H	M	M	M	M	L	M	L	M	M	M	H	H	H	H
18MEC210L	Automation Laboratory	H	H	H	H	M	L	L	L	L	L	L	M	M	M	M

18MEC211L	Metrology and Quality Control Laboratory	H	H	H	H	M	M	H	L	L	L	L	H	M	M	M
18MEP101L	Massive Open Online Course - I	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18MEP102L	Industrial Training-I	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18MEP103L	Seminar - I	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18MEP104L	Massive Open Online Course - II	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18MEP105L	Industrial Training-II	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18MEP106L	Seminar - II	H	M	M	M	M	M	M	M	H	H	H	M	H	H	H
18MEP107L	Minor Project	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
18MEP108L	Internship (4-6 weeks)	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
18MEP109L	Project	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
18MEP110L	Semester Internship	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M
	Program Average	H	H	H	H	H	M	M	H	H	H	H	H	H	M	M

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

Semester - I

Code	Course Title	Hours/ Week L	T	P	C
18LEH10XJ	Chinese / French / German / Japanese/ Korean	2	0	2	3
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18CYB101J	Chemistry	3	1	2	5
18CSS101J	Programming for Problem Solving	3	0	4	5
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3
18PDM101L	Professional Skills and Practices	0	0	2	0
18LEM102J	Value Education	1	0	1	0
18GNM102L	NSS	0	0	2	0
18GNM103L	NCC				
18GNM104L	NSO				
	Total Learning Credits				**20**

Semester - II

Code	Course Title	Hours/ Week L	T	P	C
18LEH101J	English	2	0	2	3
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
18MES104L	Active Learning Laboratory	0	0	2	1
18PDH101T	General Aptitude	0	0	2	1
18LEM101T	Constitution of India	1	0	0	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
	Total Learning Credits				**22**

Semester - III

Code	Course Title	Hours/ Week L	T	P	C
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MES201T	Engineering Mechanics	3	1	0	4
18MEC101T	Thermodynamics	3	1	0	4
18MEC102T	Fluid Mechanics	3	1	0	4
18MEC103T	Manufacturing Technology	3	1	0	4
18MEC104L	Fluid Dynamics Laboratory	0	0	2	1
18MEC105L	Manufacturing Process Laboratory	0	0	2	1
18PDH103T	Social Engineering	2	0	0	2
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development				
18CYM101T	Environmental Science	1	0	0	0
	Total Learning Credits				**24**

Semester - IV

Code	Course Title	Hours/ Week L	T	P	C
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
18MEC106T	Mechanics of Solids	3	1	0	4
18MEC107T	Applied Thermal Engineering	3	1	0	4
18MEC108T	Materials Technology	3	0	0	3
18MEC109L	Strength of Materials Laboratory	0	0	2	1
18MEC110L	Heat Power Laboratory	0	0	2	1
18MEC111L	Materials Technology Laboratory	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
18PDM204L	Business Basics for Entrepreneurs				
	Total Learning Credits				**22**

Semester - V

Code	Course Title	Hours/ Week L	T	P	C
18PYB201T	Waves and Optics	3	1	0	4
18MEC201T	Machines and Mechanisms	3	1	0	4
18MEC202T	Heat and Mass Transfer	3	1	0	4
18MEC203L	Machine Dynamics Laboratory	0	0	2	1
18MEC204L	Simulation Laboratory	0	0	2	1
18MEC205L	Heat and Mass Transfer Laboratory	0	0	2	1
	Professional Elective – 1	3	0	0	3
	Professional Elective – 2	3	0	0	3
	Open Elective – 1	3	0	0	3
18MEP101L	Massive Open Online Course - I	0	0	2	1
18MEP102L	Industrial Training-I				
18MEP103L	Seminar - I				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management				
18LEM110L	Indian Art Form	0	0	2	0
	Total Learning Credits				**25**

Semester - VI

Code	Course Title	Hours/ Week L	T	P	C
18MEC206T	Metrology and Quality Control	3	0	0	3
18MEC207T	CAD/CAM	3	0	0	3
18MEC208T	Mechanical Engineering Design	3	1	0	4
18MEC209L	CAD / CAM Laboratory	0	0	2	1
18MEC210L	Automation Laboratory	0	0	2	1
18MEC211L	Metrology and Quality Control Laboratory	0	0	2	1
18MEC350T	Comprehension	0	1	0	1
	Professional Elective – 3	3	0	0	3
	Open Elective – 2	3	0	0	3
18MEP104L	Massive Open Online Course - II	0	0	2	1
18MEP105L	Industrial Training-II				
18MEP106L	Seminar - II				
18PDH201T	Employability Skills and Practices	0	0	2	1
18LEM109T	Indian Traditional Knowledge	1	0	0	0
	Total Learning Credits				**22**

Semester - VII

Code	Course Title	Hours/ Week L	T	P	C
	Professional Elective – 4	3	0	0	3
	Professional Elective – 5	3	0	0	3
	Open Elective – 3	3	0	0	3
	Open Elective – 4	3	0	0	3
18MEP107L	Minor Project	0	0	6	3
18MEP108L	Internship (4-6 weeks)				
	Total Learning Credits				**15**

Semester - VIII

Code	Course Title	Hours/ Week L	T	P	C
18MEP109L	Project	0	0	20	10
18MEP110L	Semester Internship				
	Total Learning Credits				**10**