

# **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 & 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, Kancheepuram District 603203, Tamil Nadu,  
India**

## 1. B.Tech. in Aerospace Engineering

### 27. (a) Mission of the Department

Mission Stmt - 1	Impart student's essential knowledge and skills required for a successful career as in aerospace engineering
Mission Stmt - 2	Instill confidence in the students to take up new challenges by grooming them appropriately
Mission Stmt - 3	Inculcate in the students a sense of commitment to professional ethics, moral values with emphasis on team work and leadership qualities
Mission Stmt - 4	Ingrain the students with a clear awareness of environmental issues and their relevance to engineering profession
Mission Stmt - 5	Impress upon the students the impact of their work on the nation's economic and social progress

### 27. (b) Program Educational Objectives (PEO)

PEO - 1	Offer the students those skill sets and domain knowledge based on contemporary requirements
PEO - 2	Provide the students with the capabilities in the areas of analysis, design, manufacture and testing
PEO - 3	Ignite the minds of students to take up research and development in aerospace engineering with missionary zeal
PEO - 4	Train the students to become effective communicators in professional as well as general aspects of life
PEO - 5	Prepare the students into balanced individuals who are keen to leave a mark by excelling in their profession

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

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3	Mission Stmt. - 4	Mission Stmt. - 5
PEO - 1	H	H	M	H	M
PEO - 2	H	M	H	H	H
PEO - 3	M	H	M	H	H
PEO - 4	H	H	H	L	M
PEO - 5	L	H	M	H	H

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

### 27. (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	H	L	M	L	M	M	H	H	M	H	H
PEO - 2	H	H	H	H	H	L	M	L	M	H	M	M	H	H	M
PEO - 3	H	H	H	H	H	M	H	M	M	M	H	H	H	M	M
PEO - 4	H	M	M	H	H	H	M	H	H	H	H	L	M	M	H
PEO - 5	M	M	H	H	M	H	M	H	H	H	M	M	H	M	M

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

### PSO – Program Specific Outcomes (PSO)

PSO - 1	Ability to be aware about Safety aspects
PSO - 2	Ability to build Reliable systems and practices
PSO - 3	Ability to maintain systems and practices

## 27. (e) Program Structure: B.Tech. in Aerospace 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	
18EES102L	Electrical and Electronics Eng. Workshop	1	0	4	3	
18CSS101J	Programming for Problem Solving	3	0	4	5	
Total Learning Credits					16	
Professional Elective Courses (E) (Any 6 Courses)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
18ASE201T	Industrial Aerodynamics	3	0	0	3	
18ASE202T	Applied Structural Mechanics	3	0	0	3	
18ASE203T	Experimental Stress Analysis	3	0	0	3	
18ASE204T	Composite Materials & Structures	3	0	0	3	
18ASE205T	Theory of Plates and Shells	3	0	0	3	
18ASE206T	Theory of Elasticity	3	0	0	3	
18ASE207T	Fundamentals of Combustion	3	0	0	3	
18ASE208T	Heat Transfer	3	0	0	3	
18ASE209T	Theory of Fire Propagation and Safety	3	0	0	3	
18ASE210T	Airframe Maintenance and Repair	3	0	0	3	
18ASE211T	Airborne Sensors and Actuators	3	0	0	3	
18ASE301T	Aircraft Control Systems	3	0	0	3	
18ASE302T	Helicopter Aerodynamics	3	0	0	3	
18ASE303T	Rocket Aerodynamics	3	0	0	3	
18ASE304T	Space Mission Design and Analysis	3	0	0	3	
18ASE305T	Vibrations and Elements of Aeroelasticity	3	0	0	3	
18ASE306T	Digital Avionics	3	0	0	3	
18ASE307T	Computational Heat Transfer & Fluid Dynamics	3	0	0	3	
18ASE308T	Rockets and Missiles	3	0	0	3	
18ASE309T	Fatigue and Fracture Mechanics	3	0	0	3	
18ASE310T	Cryogenic Engineering	3	0	0	3	
18ASE311T	Aircraft Engine and Instrument Systems	3	0	0	3	
18ASE312T	Helicopter Maintenance	3	0	0	3	
18ASE313T	Aerial Robotics	3	0	0	3	
18ASE314T	Turbulence and Turbulence Modeling	3	0	0	3	
18ASE315T	High Temperature Gas Dynamics	3	0	0	3	
18ASE316T	Hypersonic Aerothermodynamics	3	0	0	3	
Total Learning Credits					18	
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					
18PDM203L	Entrepreneurial Skill Development	0	0	2	0	
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					
18GNM103L	NCC	0	0	2	0	
18GNM104L	NSO					
18LEM109T	Indian Traditional Knowledge	1	0	0	0	
18LEM110L	Indian Art Form	0	0	2	0	

Basic Science Courses (B)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
18PYB102J	Physics: Mechanics and Mechanics of Solids	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	
18MAB301T	Probability and Statistics	3	1	0	4	
18BTB101T	Biology	2	0	0	2	
Total Learning Credits					32	
Professional Core Courses (C)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
18ASC101T	Applied Engineering Mechanics	3	1	0	4	
18ASC102J	Applied Fluid Mechanics	3	0	2	4	
18ASC103T	Aero Engineering Thermodynamics	3	0	0	3	
18ASC104J	Aircraft Materials and Production Techniques	3	0	2	4	
18ASC105T	Aircraft Systems and Instruments	3	0	0	3	
18ASC201J	Applied Solid Mechanics	3	0	2	4	
18ASC202J	Incompressible Aerodynamics	3	0	2	4	
18ASC203T	Air Breathing Propulsion	3	0	0	3	
18ASC301J	Compressible Aerodynamics	3	0	2	4	
18ASC302T	Flight Dynamics – I	3	0	0	3	
18ASC303J	Rocket Propulsion	3	0	2	4	
18ASC304J	Aircraft Structures	3	0	2	4	
18ASC305T	Flight Dynamics – II	3	0	0	3	
18ASC306T	Introduction to Space Technology	3	0	0	3	
18ASC307L	Aircraft Component Drawing and Computational Analysis Laboratory	0	0	2	1	
18ASC350T	Comprehension	0	1	0	1	
Total Learning Credits					52	
Open Elective Courses (O) (Any 5 Courses)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
18ASO101T	Elements of Aeronautics	3	0	0	3	
18ASO102T	Creativity, Innovation, & New Product Development	3	0	0	3	
18ASO103T	Aviation and Airline Maintenance Management	3	0	0	3	
18ASO104T	Aircraft General Engineering and Maintenance Practices	3	0	0	3	
18ASO105T	Flow Visualization Techniques	3	0	0	3	
18ASO106T	Airport Engineering	3	0	0	3	
18ASO107T	Molecular Gas Dynamics	3	0	0	3	
Total Learning Credits					15	
Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)						
Course Code	Course Title	Hours/ Week				
		L	T	P	C	
18ASP101L	Massive Open Online Course - I					
18ASP102L	Industrial Training-I	0	0	2	1	
18ASP103L	Seminar - I					
18ASP104L	Massive Open Online Course - II					
18ASP105L	Industrial Training-II	0	0	2	1	
18ASP106L	Seminar - II					
18ASP107L	Minor Project	0	0	6	3	
18ASP108L	Internship (4-6 weeks)					
18ASP109L	Project	0	0	20	10	
18ASP110L	Semester Internship					
Total Learning Credits					15	

## 27. (f) Program Articulation: B.Tech. in Aerospace 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
18ASC101T	Applied Engineering Mechanics	H	H	M	M	L	L	L	L	L	L	L	H	M
18ASC102J	Applied Fluid Mechanics	H	H	M	M	M	L	L	L	L	L	L	H	M
18ASC103T	Aero Engineering Thermodynamics	H	H	M	M	M	L	M	M	L	M	L	H	M
18ASC104J	Aircraft Materials and Production Techniques	H	M	M	M	M	L	M	L	M	M	L	H	H
18ASC105T	Aircraft Systems and Instruments	H	M	M	M	M	L	M	L	M	M	M	H	H
18ASC201J	Applied Solid Mechanics	H	H	M	M	M	L	L	L	M	M	M	M	M
18ASC202J	Incompressible Aerodynamics	H	H	H	H	M	L	L	L	M	L	M	H	L
18ASC203T	Air Breathing Propulsion	H	H	M	H	M	L	M	M	L	L	M	H	M
18ASC301J	Compressible Aerodynamics	H	H	H	H	M	L	L	L	M	M	M	M	L
18ASC302T	Flight Dynamics – I	H	H	H	H	M	L	L	L	H	L	M	H	H
18ASC303J	Rocket Propulsion	H	H	M	H	M	L	M	M	L	L	M	H	M
18ASC304J	Aircraft Structures	H	H	M	M	M	L	L	L	M	M	M	M	M
18ASC305T	Flight Dynamics – II	H	H	H	H	M	M	M	L	L	M	M	L	L
18ASC306T	Introduction to Space Technology	H	H	H	H	M	L	M	L	H	L	M	H	M
18ASC307L	Aircraft Component Drawing and Computational Analysis Laboratory	H	H	M	H	M	L	L	L	M	M	M	H	M
18ASE201T	Industrial Aerodynamics	H	H	M	M	H	H	H	L	M	L	L	H	M
18ASE202T	Applied Structural Mechanics	H	H	M	M	M	L	L	L	M	M	M	M	M
18ASE203T	Experimental Stress Analysis	H	H	M	M	M	L	L	L	M	M	H	M	M
18ASE204T	Composite Materials & Structures	H	H	M	H	M	L	L	L	M	M	M	H	M
18ASE205T	Theory of Plates and Shells	H	H	M	H	M	L	L	L	M	M	M	H	M
18ASE206T	Theory of Elasticity	H	H	M	H	M	L	L	L	M	M	M	H	M
18ASE207T	Fundamentals of Combustion	H	H	H	H	M	M	H	M	M	M	H	H	M
18ASE208T	Heat Transfer	H	H	H	H	L	M	H	L	L	L	L	H	M
18ASE209T	Theory of Fire Propagation and Safety	H	H	H	H	L	M	H	L	L	L	L	H	M
18ASE210T	Airframe Maintenance and Repair	H	M	M	M	M	L	M	L	M	M	M	H	H
18ASE211T	Airborne Sensors and Actuators	H	H	H	H	M	L	L	L	L	L	L	M	M
18ASE301T	Aircraft Control Systems	H	H	H	H	M	M	H	L	L	L	L	H	M
18ASE302T	Helicopter Aerodynamics	H	H	H	H	M	L	L	L	M	M	M	M	M
18ASE303T	Rocket Aerodynamics	H	H	H	H	H	M	M	L	M	L	M	H	H
18ASE304T	Space Mission Design and Analysis	H	H	H	H	M	H	M	L	M	M	H	M	M
18ASE305T	Vibrations and Elements of Aero-elasticity	H	H	M	H	M	L	L	L	M	M	M	H	M
18ASE306T	Digital Avionics	H	H	H	H	L	L	M	M	M	L	L	M	H
18ASE307T	Computational Heat Transfer and Fluid Dynamics	H	H	H	H	H	L	H	L	L	L	L	H	H
18ASE308T	Rockets and Missiles	H	H	H	H	M	L	H	L	M	L	H	H	H
18ASE309T	Fatigue and Fracture Mechanics	H	H	M	H	M	L	L	L	M	M	M	H	M
18ASE310T	Cryogenic Engineering	H	H	M	H	H	L	M	M	L	L	M	H	M
18ASE311T	Aircraft Engine and Instrument Systems	H	M	M	M	M	L	M	L	M	M	M	H	H
18ASE312T	Helicopter Maintenance	H	H	M	M	M	L	M	L	L	L	M	H	H
18ASE313T	Aerial Robotics	H	H	H	H	M	M	H	L	L	L	L	H	M
18ASE314T	Turbulence and Turbulence Modeling	H	-	H	H	H	H	-	-	-	-	-	M	M
18ASE315T	High Temperature Gas Dynamics	H	M	-	L	-	-	M	-	-	-	-	H	M
18ASE316T	Hypersonic Aerothermodynamics	H	M	-	H	L	-	-	-	-	-	-	M	H
18ASO101T	Elements of Aeronautics	H	H	M	H	L	L	M	L	L	L	L	H	M
18ASO102T	Creativity, Innovation and New Product Development	M	L	L	L	L	H	H	H	H	H	H	H	H
18ASO103T	Aviation and Airline Maintenance Management	H	L	L	L	L	M	M	L	L	L	M	M	H
18ASO104T	Aircraft General Engineering and Maintenance Practices	H	H	L	L	L	L	M	L	H	M	L	H	H
18ASO105T	Flow Visualization Techniques	H	H	M	M	M	L	L	L	L	M	M	M	L
18ASO106T	Airport Engineering	H	L	H	M	M	M	M	L	M	L	L	M	H
18ASO107T	Molecular Gas Dynamics	H	H	-	L	M	-	-	-	-	-	-	L	H
18ASP101L	Massive Open Online Course - I	H	M	M	M	M	M	M	M	H	H	H	M	H
18ASP102L	Industrial Training-I	H	M	M	M	M	M	M	M	H	H	H	M	H
18ASP103L	Seminar - I	H	M	M	M	M	M	M	M	H	H	H	M	H
18ASP104L	Massive Open Online Course - II	H	M	M	M	M	M	M	M	H	H	H	M	H
18ASP105L	Industrial Training-II	H	M	M	M	M	M	M	M	H	H	H	M	H
18ASP106L	Seminar - II	H	M	M	M	M	M	M	M	H	H	H	M	H
18ASP107L	Minor Project	H	H	H	H	H	M	M	H	H	H	H	H	M
18ASP108L	Internship (4-6 weeks)	H	H	H	H	H	M	M	H	H	H	H	H	M
18ASP109L	Project	H	H	H	H	H	M	M	H	H	H	H	H	M
18ASP110L	Semester Internship	H	H	H	H	H	M	M	H	H	H	H	H	M
	Program Average	H	H	M	H	M	M	M	M	H	H	H	H	M

## 27. (g) Implementation Plan: B.Tech. in Aerospace Engineering

Semester - I					
Code	Course Title	Hours/ Week			C
		L	T	P	
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			C
		L	T	P	
18LEH101J	English	2	0	2	3
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB102J	Physics: Mechanics and Mechanics of Solids	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3
18MES102J	Basic Civil and Mechanical Engineering	3	1	2	5
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					21

Semester - III					
Code	Course Title	Hours/ Week			C
		L	T	P	
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18ASC101T	Applied Engineering Mechanics	3	1	0	4
18ASC102J	Applied Fluid Mechanics	3	0	2	4
18ASC103T	Aero Engineering Thermodynamics	3	0	0	3
18ASC104J	Aircraft Materials and Production Techniques	3	0	2	4
18ASC105T	Aircraft Systems and Instruments	3	0	0	3
18PDH103T	Social Engineering	2	0	0	2
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM203L	Entrepreneurial Skill Development	1	0	0	0
18CYM101T	Environmental Science				
Total Learning Credits					24

Semester - IV					
Code	Course Title	Hours/ Week			C
		L	T	P	
18MAB202T	Numerical Methods for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
18ASC201J	Applied Solid Mechanics	3	0	2	4
18ASC202J	Incompressible Aerodynamics	3	0	2	4
18ASC203T	Air Breathing Propulsion	3	0	0	3
	Open Elective - I	3	0	0	3
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			C
		L	T	P	
18MAB301T	Probability and Statistics	3	1	0	4
18ASC301J	Compressible Aerodynamics	3	0	2	4
18ASC303J	Rocket Propulsion	3	0	2	4
18ASC304J	Aircraft Structures	3	0	2	4
	Professional Elective – 1	3	0	0	3
	Open Elective – 2	3	0	0	3
18ASP101L	Massive Open Online Course - I	0	0	2	1
18ASP102L	Industrial Training-I				
18ASP103L	Seminar - I				
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18PDM302L	Entrepreneurship Management	0	0	2	0
18LEM110L	Indian Art Form				
Total Learning Credits					23

Semester - VI					
Code	Course Title	Hours/ Week			C
		L	T	P	
18ASC302T	Flight Dynamics - I	3	0	0	3
18ASC306T	Introduction to Space Technology	3	0	0	3
18ASC350T	Comprehension	0	1	0	1
	Professional Elective – 2	3	0	0	3
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Open Elective – 3	3	0	0	3
18ASP104L	Massive Open Online Course - II	0	0	2	1
18ASP105L	Industrial Training-II				
18ASP106L	Seminar - II				
18PDH201T	Employability Skills and Practices	0	0	2	1
18LEM109T	Indian Traditional Knowledge	1	0	0	0
Total Learning Credits					21

Semester - VII					
Code	Course Title	Hours/ Week			C
		L	T	P	
18ASC305T	Flight Dynamics – II	3	0	0	3
	Professional Elective – 5	3	0	0	3
	Professional Elective – 6	3	0	0	3
	Open Elective – 4	3	0	0	3
	Open Elective – 5	3	0	0	3
18ASC307L	Aircraft Component Drawing and Computational Analysis Laboratory	0	0	2	1
18ASP107L	Minor Project	0	0	6	3
18ASP108L	Internship (4-6 weeks)				
Total Learning Credits					19

Semester - VIII					
Code	Course Title	Hours/ Week			C
		L	T	P	
18ASP109L	Project	0	0	20	10
18ASP110L	Semester Internship				
Total Learning Credits					10