

**DEPARTMENT OF  
AEROSPACE ENGINEERING**

**B.Tech. (Aerospace Engineering) – 2020 - 21**  
**REVISED COURSE COMPONENTS AND CURRICULUM**  
**PROGRAM STRUCTURE**

Category	Credit
<b>Category 1</b> : Humanities, Social Sciences and Management Courses	5
<b>Category 2</b> : Entrepreneurship	10
<b>Category 3</b> : Basic Sciences	18
<b>Category 4</b> : Engineering Sciences	12
<b>Category 5</b> : Professional Core	73
<b>Category 6</b> : Professional Electives	21/27
<b>Category 7</b> : Open Electives	6
<b>Category 8</b> : Online Courses	5*
<b>Category 9</b> : Internships, Projects, Patent and Products	15/09
<b>Category 10</b> : Mandatory Courses	-
<b>Total Credits</b>	<b>160+5*</b>

*\*The students shall earn 5 credits through online courses between 2<sup>nd</sup> and 7<sup>th</sup> semester (both inclusive)*

**COURSE COMPONENTS**

**Category 1**

**HUMANITIES AND SOCIAL SCIENCES AND MANAGEMENT COURSES**

Sl. No	Code No.	Course Title	Credits			
			L	T	P	C
1	20MS2005	Soft Skills	1	0	0	1
2		Technical Communication / Other Languages <ul style="list-style-type: none"> <li>• A Stream - Foreign Languages</li> <li>• B Stream - Online Course</li> <li>• C Stream - Classroom teaching including lab</li> </ul>	2	0	0	2
3	20MS2006	Professional Ethics	2	0	0	2
		<b>Total Credits</b>	<b>5</b>			

**Category 2**

**ENTREPRENEURSHIP COURSES**

Sl. No	Code No.	Course Title	Credits			
			L	T	P	C
1	20MS2003	Concepts of Entrepreneurship	1	0	0	1
2	20MS2004	Entrepreneurship and Product Development	3	0	0	3
3	20MS2007	Business Plan	3	0	0	3
4	20MS2008	Artificial Intelligence for Business	3	0	0	3
		<b>Total Credits</b>	<b>10</b>			

**Category 3**

**BASIC SCIENCES COURSES**

Sl. No	Code No.	Course Title	Credits			
			L	T	P	C
1	20CH1001	Essentials of Chemistry for Aerospace Engineers	3	0	0	3
2	20PH1001	Elements of Physics in Aviation	3	0	0	3
3	20MA1001	Analytic Geometry, Calculus and Linear Algebra	3	0	2	4
4	20MA1002	Differential Equations and Complex Variables	3	0	2	4
5	20MA2001	Numerical Mathematics and Statistics	3	0	2	4
		<b>Total Credits</b>	<b>18</b>			

**Category 4**  
**ENGINEERING SCIENCES COURSES**

Sl. No	Code No.	Course Title	Credits			
			L	T	P	C
1	19ME1003	Engineering Mechanics	3	0	0	3
2	20CS1004	Fundamentals of Python Programming	3	0	0	3
3	20CS1005	Fundamentals of Python Programming Laboratory	0	0	2	1
4	20EC2014	Basics of Electronics for Aerospace Engineering	3	0	0	3
5	17GA2001	General Aptitude	1	0	0	1
6	20AE2030	Technical Aptitude	1	0	0	1
<b>Total Credits</b>			<b>12</b>			

**Category 5**  
**PROFESSIONAL CORE COURSES**

Sl. No.	Code No.	Course Title	Credits			
			L	T	P	C
1	20AE2001	Introduction to Aerospace Engineering	3	0	0	3
2	20AE2002	Basics of Fluid Mechanics	3	0	0	3
3	20AE2003	Fluid Mechanics Laboratory	0	0	2	1
4	20AE2004	Computer Aided Aircraft Drawing	0	0	4	2
5	20AE2005	Strength of Materials	3	0	0	3
6	20AE2006	Strength of Materials Laboratory	0	0	2	1
7	20AE2007	Engineering Thermodynamics	3	0	0	3
8	20AE2008	Thermodynamics and Heat Transfer Laboratory	0	0	4	2
9	20AE2009	Aerodynamics	3	0	0	3
10	20AE2010	CAD/CAM Laboratory	0	0	4	2
11	20AE2011	Aerospace Structures-I	3	0	0	3
12	20AE2012	Propulsion-I	3	0	0	3
13	20AE2013	Propulsion Laboratory	0	0	2	1
14	20AE2014	Airplane performance	3	0	0	3
15	20AE2015	Aerodynamics Laboratory	0	0	2	1
16	20AE2016	Introduction to Aerospace Materials	3	0	0	3
17	20AE2017	Gas dynamics	3	0	0	3
18	20AE2018	Aircraft Instrumentation and Avionics	3	0	0	3
19	20AE2019	Space Dynamics	3	0	0	3
20	20AE2020	Aerospace Structures-II	3	0	0	3
21	20AE2021	Aerospace Structures and Composite Laboratory	0	0	4	2
22	20AE2022	Propulsion-II	3	0	0	3
23	20AE2023	Computational Fluid Dynamics	3	0	0	3
24	20AE2024	Computational Fluid Dynamics Laboratory	0	0	2	1
25	20AE2025	Aircraft Stability and Control	3	0	0	3
26	20AE2026	Flight Stability and Aero Modelling Laboratory	0	0	2	1
27	20AE2027	Finite Element Analysis	3	0	0	3
28	20AE2028	Finite Element Analysis Laboratory	0	0	2	1
29	20AE2029	Aircraft Design Project	0	0	8	4
30	20AE2062	Heat and Mass Transfer	3	0	0	3
<b>Total Credits</b>			<b>73</b>			

### Category 6

#### PROFESSIONAL ELECTIVES COURSES

Sl. No.	Code No.	Course Title	Credits			
			L	T	P	C
1	20AE2031	Helicopter Aerodynamics	3	0	0	3
2	20AE2032	Theory of elasticity	3	0	0	3
3	20AE2033	Design and Analysis of Composite Structures	3	0	0	3
4	20AE2034	Introduction to Non Destructive Testing	3	0	0	3
5	20AE2035	Structural Vibration	3	0	0	3
6	20AE2036	Aeroelasticity	3	0	0	3
7	20AE2037	Cryogenic Propulsion	3	0	0	3
8	20AE2038	Rocket and Missiles	3	0	0	3
9	20AE2039	Advanced Space Dynamics	3	0	0	3
10	20AE2040	Air Traffic Control and Aerodrome Details	3	0	0	3
11	20AE2041	Aircraft Systems	3	0	0	3
12	20AE2042	Basics of Acoustics	3	0	0	3
13	20AE2043	Experimental Stress Analysis	3	0	0	3
14	20AE2044	Boundary layers theory	3	0	0	3
15	20AE2045	Introduction to Hypersonic Flows	3	0	0	3
16	20AE2046	Fatigue and Fracture Mechanics	3	0	0	3
17	20AE2047	Fundamental of Combustion	3	0	0	3
18	20AE2048	Unmanned Aircraft Systems	3	0	0	3
19	20AE2049	Industrial Aerodynamics	3	0	0	3
20	20AE2050	Navigation, Guidance and Control of Aerospace Vehicles	3	0	0	3
21	20AE2051	Aircraft Instrumentation and Control Laboratory	0	0	2	1
22	20AE2052	Wind tunnel Techniques	3	0	0	3
23	20AE2053	Machine Learning and Artificial Intelligence in Aerospace Applications	3	0	0	3
24	20AE2054	Internet of Things in Aerospace Applications	3	0	0	3
25	20AE2055	Space Systems Engineering	3	0	0	3
26	19AE2004	Engineering design and cost Engineering	3	0	0	3

### Category 7

#### ONLINE COURSES

*The students shall earn 5 credits through online courses between 2<sup>nd</sup> and 7<sup>th</sup> semester (both inclusive)*

### Category 8

#### OPEN ELECTIVE COURSES

Sl.	Code No.	Course Title	Credits			
			L	T	P	C
1	20AE2056	Basics of Aerospace Engineering	3	0	0	3
2	20AE2057	Road Vehicle Aerodynamics	3	0	0	3
3	20AE2058	Wind Turbine Design	3	0	0	3
4	20AE2059	Building Aerodynamics	3	0	0	3
5	20AE2060	Introduction to Unmanned Aircraft System	3	0	0	3
6	20AE2061	Foundations of Space Engineering	3	0	0	3

**Category 9**  
**INTERNSHIPS, PROJECTS, PATENT AND PRODUCTS**

Sl. No.	Code No.	Course Title	Credits			
			L	T	P	C
1		Industry Internships	0	0	6	3
2	20AE2999	Projects, Patent and Products	0	0	24	12
<b>Total Credits</b>			<b>15</b>			

**Category 10**  
**MANDATORY COURSES**

Sl. No.	Code No.	Course Title	Credits			
			L	T	P	C
1	18CH2001	Environmental Studies	3	0	0	0
2	18MS2014	Constitution of Indian	2	0	0	0

**SEMESTER-WISE CURRICULUM**

**Semester I**

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	HSMC		Technical Communication / Other Languages <ul style="list-style-type: none"> <li>• A Stream – Foreign Languages</li> <li>• B Stream – Online Course</li> <li>• C Stream – Classroom teaching including lab</li> </ul>	2	0	0	2	2
2	BSC	20MA1001	Analytic Geometry, Calculus and Linear Algebra (Maths I)	3	0	2	5	4
3	BSC	20CH1001	Essentials of Chemistry for Aerospace Engineers	3	0	0	3	3
4	PCC	20AE2001	Introduction to Aerospace Engineering	3	0	0	3	3
5	MC		Mandatory Course I	2	0	0	2	0
6	ESC	20EC2014	Basics of Electronics for Aerospace Engineering	3	0	0	3	3
<b>Total Contact Hours</b>							18	
<b>Total Credits</b>								15

**Semester II**

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	BSC	20MA1002	Differential Equations and complex Variables	3	0	2	5	4
2	ESC	19ME1003	Engineering Mechanics	3	0	0	3	3
3	PCC	20AE2004	Computer Aided Aircraft Drawing	0	0	4	4	2
4	ESC	20CS1004	Applications of Python Programming	3	0	0	3	3
5	ESC	20CS1005	Applications of Python Programming Laboratory	0	0	2	2	1
6	BSC	20PH1001	Elements of Physics in Aviation	3	0	0	3	3
7	PCC	20AE2002	Basics of Fluid Mechanics	3	0	0	3	3
8	PCC	20AE2003	Fluid Mechanics Laboratory	0	0	2	2	1
9	HSMC	20MS2005	Soft Skill	1	0	0	1	1
10	EC	20MS2003	Concepts of Entrepreneurship	1	0	0	1	1
11	MC		Mandatory Course II	2	0	0	2	0
<b>Total Contact Hours</b>							29	
<b>Total Credits</b>								22

**Semester III**

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	BSC	20MA2001	Numerical Mathematics and Statistics	3	0	2	5	4
2	PCC	20AE2005	Strength of Materials	3	0	0	3	3
3	PCC	20AE2006	Strength of Materials Laboratory	0	0	2	2	1
4	PCC	20AE2007	Engineering Thermodynamics	3	0	0	3	3
5	PCC	20AE2008	Thermodynamics and Heat Transfer Laboratory	0	0	4	4	2
6	PCC	20AE2009	Aerodynamics	3	0	0	3	3
7	PCC	20AE2010	CAD/CAM Laboratory	0	0	4	4	2
8	HSMC	20MS2006	Professional Ethics	2	0	0	2	2
9	EC	20MS2004	Entrepreneurship and Product Development	3	0	0	3	3
<b>Total Contact Hours</b>							29	
<b>Total Credits</b>								23

#### Semester IV

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	PCC	20AE2011	Aerospace Structures-I	3	0	0	3	3
2	PCC	20AE2012	Propulsion-I	0	0	3	3	3
3	PCC	20AE2013	Propulsion Laboratory	0	0	2	2	1
4	PCC	20AE2014	Airplane performance	3	0	0	3	3
5	PCC	20AE2015	Aerodynamics Laboratory	0	0	2	2	1
6	PCC	20AE2016	Introduction to Aerospace Materials	3	0	0	3	3
7	PCC	20AE2017	Gas Dynamics	3	0	0	3	3
8	PCC	20AE2018	Aircraft Instrumentation & Avionics	3	0	0	3	3
9	OEC		Open Elective Course – 1	3	0	0	3	3
10	ESC	17GA2001	General Aptitude	1	0	0	1	1
11		ISP2921/ITP2921	Internship / Industrial Training - I	0	0	2	0	1
							<b>Total Contact Hours</b>	26
							<b>Total Credits</b>	25

#### Semester V

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	PCC	20AE2019	Space Dynamics	3	0	0	3	3
2	PCC	20AE2020	Aerospace Structures-II	3	0	0	3	3
3	PCC	20AE2021	Aerospace Structures and Composite Lab	0	0	4	4	2
4	PCC	20AE2022	Propulsion-II	3	0	0	3	3
5	PCC	20AE2023	Computational Fluid Dynamics	3	0	0	3	3
6	PCC	20AE2024	Computational Fluid Dynamics Lab	0	0	2	2	1
7	PCC	20AE2062	Heat and Mass Transfer	3	0	0	3	3
8	PEC		Professional Elective Course – 1	3	0	0	3	3
9	OEC		Open Elective Course – 2	3	0	0	3	3
10		ISP2922/ITP2922	Internship Industrial Training - II	0	0	2	0	1
							<b>Total Contact Hours</b>	27
							<b>Total Credits</b>	25

#### Semester VI

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	PCC	20AE2025	Aircraft Stability and Control	3	0	0	3	3
2	PCC	20AE2026	Flight Stability and Aero modelling Lab	0	0	2	2	1
3	PCC	20AE2027	Finite Element Analysis	3	0	0	3	3
4	PCC	20AE2028	Finite Element Analysis Laboratory	0	0	2	2	1
5	PEC		Professional Elective Course – 2	3	0	0	3	3
6	PEC		Professional Elective Course – 3	3	0	0	3	3
7	PEC		Professional Elective Course – 4	3	0	0	3	3
8	PEC		Professional Elective Course – 5	3	0	0	3	3
9	ESC	20AE2030	Technical Aptitude	1	0	0	2	1
10		ISP2923/ITP2923	Internship Industrial Training - III	0	0	2	0	1
11	EC	20MS2007	Business Plan	3	0	0	3	3
<b>Total Contact Hours</b>							26	
<b>Total Credits</b>								25

#### Semester VII

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	PCC	20AE2029	Aircraft Design Project	0	0	8	8	4
2	PEC		Professional Elective Course – 6	3	0	0	3	3
3	PEC		Professional Elective Course – 7	3	0	0	3	3
4	EC	20MS2008	Artificial Intelligence for Business	3	0	0	3	3
<b>Total Contact Hours</b>							13	
<b>Total Credits</b>								13

#### Semester: VIII

Sl. No	Category	Code No.	Course Title	L	T	P	TCH	Credits
1	ISP	20AE2999	Project / Patents / Product (Full Semester)	-	-	-	-	12
2	ISP	20AE2998	Project / Patents / Product (Part Semester)	-	-	-	-	6
3	PEC		Professional Elective Course – 8	3	0	0	3	3
4	PEC		Professional Elective Course – 9	3	0	0	3	3
<b>Total Contact Hours</b>							6	
<b>Total Credits</b>								12