

**AEROSPACE
ENGINEERING**

Table AE-1
B.Tech. Aerospace Engineering - 2019-23
COURSE COMPONENTS AND CURRICULUM

S.No	Category	Credits
1	Basic Science Courses	27
2	Engineering Science courses	23.5
3	Humanities & Social Sciences Including Management Courses	10
4	Professional Core Courses	58.5
5	Professional Elective Courses	17/23
6	Open Elective Courses	9
7	Project Work, seminar and internship in industry or appropriate work place/ academic and research institutions in India/ abroad	15/9
8	Mandatory courses [Environmental Studies, Induction Program, Indian Constitution, Value Education, etc.]	Non-credits
Total Credits		160

COURSE COMPONENTS AND CURRICULUM

Basic Science Courses (BSC)						
Sl. No	Code No.	Name of the Course	L	T	P	Credits
1	19PH1001	Engineering Physics – Mechanics and Electromagnetic waves and Optics	3	0	0	3
2	19PH1002	Engineering Physics - Mechanics and Electromagnetic waves and Optics Laboratory	0	0	2	1
3	19CH1004	Engineering Chemistry for Aerospace Engineering	3	0	0	3
4	19CH1007	Applied Chemistry Laboratory	0	0	2	1
5	19MA1001	Calculus and Linear Algebra	3	0	2	4
6	19MA1008	Ordinary Differential Equations and Complex Variables Laboratory	3	0	2	4
7	19MA2001	Partial Differential Equations, Probability and Statistics	3	0	2	4
8	19MA2010	Numerical Mathematics and Computing	3	0	2	4
9	19AE1001	Fundamentals of Space Science	3	0	0	3
Total Credits						27

Engineering Science courses (ESC)						
Sl.No	Code No.	Name of the Course	L	T	P	Credits
1	18ME1001	Engineering Drawing	0	0	4	2
2	18ME1002	Engineering Graphics Laboratory (AutoCAD)	0	0	2	1
3	19EC1001	Fundamentals Electrical and Electronics Engineering	3	1	0	4
4	19EC1002	Fundamentals Electrical and Electronics Engineering Laboratory	0	0	2	1
5	18CS1004	Programming for Problem Solving	3	0	0	3
6	18CS1002	Programming for Problem Solving Laboratory	0	0	3	1.5
7	18ME1004	Workshop/ Manufacturing Practices Laboratory	0	0	2	1
8	18ME1003	Engineering Mechanics	3	1	0	4
9	18AE2001	Introduction to Aerospace Engineering	3	0	0	3
10	18AE2002	Aerospace Materials and Processes	3	0	0	3
Total Credits						23.5

Humanities & Social Sciences Including Management Courses(HSMC)						
Sl.No	Code No.	Subject	L	T	P	Credits
1	18EN1001	English	2	0	0	2
2	18EN1002	English Language Laboratory	0	0	2	1
3	18MS2012	Engineering Economics	3	0	0	3
5	18ME2034	Operations Research	3	0	0	3
6	18ME2035	Technical Aptitude	1	0	0	1
Total Credits						10

Professional Core Courses(PCC)						
Sl.No	Code No.	Name of the Course	L	T	P	Credits
1	18AE2003	Basics of Fluid Mechanics	3	0	0	3
2	18AE2004	Fluid Mechanics Laboratory	0	0	2	1
3	18AE2005	Strength of Materials	3	0	0	3
4	18AE2006	Strength of Materials Laboratory	0	0	2	1
5	18AE2007	Thermodynamics	3	0	0	3
6	18AE2008	Thermodynamics Laboratory	0	0	2	1
7	18AE2009	Aerodynamics	3	0	0	3
8	18AE2010	Aerospace Structures-I	3	0	0	3
9	18AE2011	Propulsion-I	3	0	0	3
10	18AE2012	Propulsion Laboratory	0	0	3	1.5
11	18AE2013	Airplane performance	3	0	0	3
12	18AE2014	Gas dynamics	3	0	0	3
13	18AE2015	Aerodynamics Laboratory	0	0	3	1.5
14	18AE2016	Aerospace Structures-II	3	0	0	3
15	18AE2017	Aerospace Structures Laboratory	0	0	3	1.5
16	18AE2018	Propulsion-II	3	0	0	3
17	18AE2019	Aircraft Stability and Control	3	0	0	3
18	19AE2001	Flight Stability and Aeromodelling Laboratory	0	0	2	1
19	18AE2021	CAD/CAM Laboratory	0	0	3	1.5
20	18AE2022	Aircraft Instrumentation & Avionics	3	0	0	3
21	18AE2023	Space Dynamics	3	0	0	3
22	18AE2024	Aircraft Design Project	0	0	4	2
23	18AE2025	Navigation, Guidance and Control of Aerospace Vehicles	3	0	0	3
24	18AE2026	Aircraft Instrumentation & Control Laboratory	0	0	3	1.5
25	18AE2027	Heat and Mass Transfer	3	0	0	3
Total Credits						58.5

Professional Elective Courses (PEC)						
Sl.No	Code No.	Name of the Course	L	T	P	Credits
1	18AE2028	Computational Fluid Dynamics	3	0	0	3
2	18AE2029	Computational Fluid Dynamics Laboratory	0	0	2	1
3	18AE2030	Wind tunnel Techniques	3	0	0	3
4	18AE2031	Helicopter Aerodynamics	3	0	0	3
5	18AE2032	Finite Element Analysis	3	0	0	3

6	18AE2033	Finite Element Analysis Laboratory	0	0	2	1
7	18AE2034	Theory of Elasticity	3	0	0	3
8	18AE2035	Design and Analysis of Composite Structures	3	0	0	3
9	18AE2036	Introduction to Non Destructive Testing	3	0	0	3
10	18AE2037	Structural Vibration	3	0	0	3
11	18AE2038	Aeroelasticity	3	0	0	3
12	18AE2039	Cryogenic Propulsion	3	0	0	3
13	18AE2040	Rocket and Missiles	3	0	0	3
14	18AE2041	Advanced Space Dynamics	3	0	0	3
15	18AE2042	Air Traffic Control and Aerodrome Details	3	0	0	3
16	18AE2043	Aircraft Systems	3	0	0	3
17	18AE2044	Basics of Acoustics	3	0	0	3
18	18AE3022	Experimental Stress Analysis	3	0	0	3
19	18AE3023	Boundary Layer Theory	3	0	0	3
20	18AE3024	Introduction to Hypersonic Flows	3	0	0	3
21	18AE3025	Fatigue and Fracture Mechanics	3	0	0	3
22	18AE3026	Fundamental of Combustion	3	0	0	3
23	18AE3027	Unmanned Aircraft Systems	3	0	0	3
24	18AE3028	Industrial Aerodynamics	3	0	0	3
25	18AE3029	Composite Structures and Acoustics	3	0	0	3
Total Credits						17/23

Open Elective Courses (OEC)*						
Sl.No	Code No.	Name of the Course	L	T	P	Credits
1	18AE2045	Basics of Aerospace Engineering	3	0	0	3
2	18AE3031	Road Vehicle Aerodynamics	3	0	0	3
3	18AE3032	Wind Turbine Design	3	0	0	3
4	18AE3033	Building Aerodynamics	3	0	0	3
5	18AE3034	Introduction to Unmanned Aircraft System	3	0	0	3
6	18AE3035	Foundations of Space Engineering	3	0	0	3
Total Credits						9
*for other departments students. Aerospace students will choose 9 credits of Open Elective Courses offered by other department.						

Internship/ Industrial Training & Project Work (ISP)						
Sl.No	Code No.	Name of the Course	L	T	P	Credits
1	ISP2921/ ITP2921	Internship/ Industrial Training-I	-	-	-	1
2	ISP2922/ ITP2922	Internship/ Industrial Training-II	-	-	-	1



3	18AE2997	Project Preparation	-	-	-	1
4	18AE2999/ 18AE2998	Project Work (Part Semester/Full Semester)	-	-	-	12/6
Total Credits						15/9

SEMESTER-WISE CURRICULUM

SEMESTER I							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	BSC	19MA1001	Calculus and Linear Algebra	3	0	2	4
2	BSC	19CH1004	Engineering Chemistry for Aerospace Engineering	3	0	0	3
3	BSC	19CH1007	Applied Chemistry Laboratory	0	0	2	1
4	BSC	19AE1001	Fundamentals of Space Science	3	0	0	3
5	ESC	18CS1004	Programming for Problem Solving	3	0	0	3
6	ESC	18CS1002	Programming for Problem Solving Laboratory	0	0	3	1.5
7	HSMC	18EN1001	English	2	0	0	2
8	HSMC	18EN1002	English Language Laboratory	0	0	2	1
9	ESC	18ME1004	Workshop/ Manufacturing Practices Laboratory	0	0	2	1
10	MC		Mandatory Course I				0
Total Credits							19.5

SEMESTER II							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	BSC	19MA1008	Ordinary Differential Equations, Complex Variables	3	0	2	4
2	BSC	19PH1001	Engineering Physics – Mechanics, Electromagnetic Waves and Optics and Properties of Matter	3	0	0	3
3	BSC	19PH1002	Engineering Physics - Electromagnetism, Optics and Properties of Matter Lab	0	0	2	1
4	ESC	18ME1003	Engineering Mechanics	3	1	0	4
5	ESC	18ME2001	Introduction to Aerospace Engineering	3	0	0	3
6	ESC	18ME1001	Engineering Drawing	0	0	4	2
7	ESC	18ME1002	Engineering Graphics Laboratory (AutoCAD)	0	0	2	1

8	ESC	19EC1001	Fundamentals Electrical and Electronics Engineering	3	1	0	4
9	ESC	19EC1002	Fundamentals Electrical and Electronics Engineering Laboratory	0	0	2	1
10	MC		Mandatory Course II				0
Total Credits							23

SEMESTER III							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	BSC	19MA2001	Partial Differential Equations, Probability and Statistics	3	0	2	4
2	PCC	18AE2003	Basic of Fluid Mechanics	3	0	0	3
3	PCC	18AE2004	Fluid Mechanics Laboratory	0	0	2	1
4	PCC	18AE2005	Strength of Materials	3	0	0	3
5	PCC	18AE2006	Strength of Materials Laboratory	0	0	2	1
6	PCC	18AE2007	Thermodynamics	3	0	0	3
7	PCC	18AE2008	Thermodynamics Laboratory	0	0	2	1
8	HSMC	18MS2012	Engineering Economics	3	0	0	3
9	ESC	18AE2002	Aerospace Materials and Processes	3	0	0	3
10	MC		Mandatory Course III				0
Total Credits							22

SEMESTER IV							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	BSC	19MA2010	Numerical Mathematics and Computing	3	0	2	4
2	PCC	18AE2009	Aerodynamics	3	0	0	3
3	PCC	18AE2010	Aerospace Structures-I	3	0	0	3
4	PCC	18AE2011	Propulsion-I	3	0	0	3
5	PCC	18AE2012	Propulsion Laboratory	0	0	3	1.5
6	PCC	18AE2013	Airplane performance	3	0	0	3
7	PCC	18AE2021	CAD/CAM Laboratory	0	0	2	1.5
8	PCC	18AE2025	Space Dynamics	3	0	0	3
9	MC		Mandatory Course IV				0
Total credits							22

SEMESTER V							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	PCC	18AE2014	Gas dynamics	3	0	0	3
2	PCC	18AE2015	Aerodynamics Laboratory	0	0	3	1.5
3	PCC	18AE2016	Aerospace Structures-II	3	0	0	3
4	PCC	18AE2017	Aerospace Structures Laboratory	0	0	3	1.5
5	PCC	18AE2018	Propulsion-II	3	0	0	3
7	PCC	18AE2019	Aircraft Stability and Control	3	0	0	3

8	PCC	19AE2001	Flight Stability and Aeromodelling Laboratory	0	0	2	1
9	PCC	18AE2022	Aircraft Instrumentation & Avionics	3	0	0	3
10	OEC		Open Elective Courses-I	3	0	0	3
11	ISP	ISP2921/ ITP2921	Internship/ Industrial Training-I	15 days			1
12	MC		Mandatory Course V				0
Total Credits							23

SEMESTER VI							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	PCC	18AE2027	Heat and Mass Transfer	3	0	0	3
2	PEC		Professional Elective Courses-1	3	0	0	3
3	PEC		Professional Elective Courses-2	0	0	2	1
4	PEC		Professional Elective Courses-3	3	0	0	3
5	PEC		Professional Elective Courses-4	3	0	2	1
6	OEC		Professional Elective Courses-5	3	0	0	3
7	OEC		Open Elective Courses-II	3	0	0	3
8	HSMC	18ME203 5	Technical Aptitude	1	0	0	1
9	PCC	18AE2024	Aircraft Design Project	0	0	4	2
10	MC		Mandatory Course V				0
Total Credits							20

SEMESTER VII							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	HSMC	18ME2034	Operations Research	3	0	0	3
2	PCC	18AE2025	Navigation, Guidance and Control of Aerospace Vehicles	3	0	0	3
3	PCC	18AE2026	Aircraft Instrumentation & Avionics Laboratory	0	0	3	1.5
4	PEC		Professional Elective Courses-6	3	0	0	3
5	PEC		Professional Elective Courses-7/NPTEL/ MOOC courses	3	0	0	3
6	OEC		Open Elective Courses-III	3	0	0	3
7	ISP	18AE2997	Project Preparation	-	-	-	3
8	ISP	ISP2922/ ITP2922	Internship/ Industrial Training-II	15 days			1
Total credits							18.5

SEMESTER VIII							
Sl.No	Category	Code No.	Name of the Course	L	T	P	Credits
1	ISP	18AE2999	Project Work – Full Semester	-	-	-	12
2	ISP	18AE2998	Project Work – Part Semester	-	-	-	6

3	PEC		Professional Elective Courses-8/NPTEL/MOOC courses	3	0	0	3
4	PEC		Professional Elective Courses-9	3	0	0	3
Total credits							12