Course Template – M. Tech.

Specialization	Abbreviation
Aerodynamics	A
Flight Mechanics	FM
Propulsion	P
Structures	S
Computational Mechanics	CM
Aero-Thermodynamics and Thermal Systems	ATTS

Course Template – M. Tech. (Aerodynamics)

Semester	Non Aero non IIT Students	Non IIT Aero Students	IIT non-Aero Students	IIT Aero Students
Semester I	▪ AE-601A (C) ▪ AE-602A (C) ▪ AE-610A (C) ▪ E	▪ AE-602A (C) ▪ AE-610A (C) ▪ E ▪ E	▪ AE-601A (C) ▪ AE-610A (C) ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E
Semester II	▪ AE-612A (C) ▪ E ▪ E ▪ E	▪ AE-612A (C) ▪ E ▪ E ▪ E	▪ AE-612A (C) ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E

C: Compulsory course; E: Elective Course

*The electives can be from AE department or other depts.

**It is suggested that the students should do few courses (at least 2, if possible) from AE department.

Course Template – M. Tech. (Flight Mechanics)

IITK

Department of Aerospace Engineering

Semester	Non Aero non IIT Students	Non IIT Aero Students	IIT non-Aero Students	IIT Aero Students
Semester I	▪ AE-601A (C) ▪ AE-602A (C) ▪ AE-647A (C) ▪ E	▪ AE-602A (C) ▪ AE-647A (C) ▪ E ▪ E	▪ AE-601A (C) ▪ AE-647A (C) ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E
Semester II	▪ AE-648A (C) ▪ E ▪ E ▪ E	▪ AE-648A (C) ▪ E ▪ E ▪ E	▪ AE-648A (C) ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E

C: Compulsory course; E: Elective Course

*The electives can be from AE department or other depts.

**It is suggested that the students should do few courses (at least 2, if possible) from AE department.

Course Template – M. Tech. (Propulsion)

Semester	Non Aero non IIT Students	Non IIT Aero Students	IIT non-Aero Students	IIT Aero Students
Semester I	▪ AE-601A (C) ▪ AE-602A (C) ▪ AE-663A (C) ▪ AE-664A (C)	▪ AE-602A (C) ▪ AE-610A (C) ▪ AE-663A (C) ▪ AE-664A (C)	▪ AE-601A (C) ▪ AE-610A (C) ▪ AE-663A (C) ▪ AE-664A (C)	▪ E ▪ E ▪ E ▪ E
Semester II	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E

C: Compulsory course; E: Elective Course

*The electives can be from AE department or other depts.

**It is suggested that the students should do few courses (at least 2, if possible) from AE department.

Course Template – M. Tech. (Structures)

Semester	Non Aero non IIT Students	Non IIT Aero Students	IIT non-Aero Students	IIT Aero Students
Semester I	▪ AE-601A (C) ▪ AE-602A (C) ▪ AE-670A (C) ▪ AE-688A (C)	▪ AE-602A (C) ▪ AE-670A (C) ▪ AE-688A (C ▪ E	▪ AE-601A (C) ▪ AE-670A (C) ▪ AE-688A (C) ▪ E	▪ E ▪ E ▪ E ▪ E
Semester II	▪ AE-687A (C) ▪ E ▪ E ▪ E	▪ AE-687A (C) ▪ E ▪ E ▪ E	▪ AE-687A (C) ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E

C: Compulsory course; E: Elective Course

*The electives can be from AE department or other depts.

**It is suggested that the students should do few courses (at least 2, if possible) from AE department.

Course Template – M. Tech. (Computational Mechanics)

IITK

Department of Aerospace Engineering

Semester	Non Aero non IIT Students	Non IIT Aero Students	IIT non-Aero Students	IIT Aero Students
Semester I	▪ AE-601A (C) ▪ AE-602A (C) ▪ AE-702A (C) ▪ AE-703A (C)	▪ AE-602A (C) ▪ AE-702A (C) ▪ AE-703A (C) ▪ E	▪ AE-601A (C) ▪ AE-702A (C) ▪ AE-703A (C) ▪ E	▪ AE-702A (C) ▪ AE-703A (C) ▪ E ▪ E
Semester II	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E

C: Compulsory course;   E: Elective Course

- **E: Elective Courses**
- ❖ For Aero + IIT students: 2 from Mechanics basket, 1 from Computations basket, rest from elsewhere
- ❖ For others: 1 from Mechanics basket, 1 from Computations basket, rest from elsewhere

MECHANICS Basket

1. AE610A - AERODYNAMICS-I
2. AE612A - AERODYNAMICS II OR ME 666A - Inviscid Flows
3. AE614A - VISCOUS FLOWS OR ME 631A: Viscous Flow Theory
4. AE621A – TURBULENCE OR ME647A - Introduction to Turbulent Flows
5. AE670A - AEROSPACE STRUCTURAL ANALYSIS – I
6. AE671A - Aeroacoustics
7. AE672A - SOLID MECHANICS OR ME621A: Introduction to Solid Mechanics
8. AE674 – Advanced Hydrodynamic Stability **OR** CHE 614A - Introduction to Hydrodynamic Instability
9. AE687A - AEROSPACE STRUCTURAL ANALYSIS II
10. AE688A - DYNAMICS AND VIBRATION
11. AE606A - Unsteady Gas Dynamics
12. AE720A - Hypersonic Flow
13. AE664A - Applied Compressible Flows
14. ME625A - Applied Dynamics and Vibrations
15. ME627A - Non-linear Vibration
16. ME721A - Theory of Plasticity
17. ME679A - Damage Mechanics of Composite Materials
18. AE681A - Composite materials
19. AE682A - Composite structures
20. CE622A - Stability of structures
21. ME 723A - Wave propagation in solids
22. ME728A - Fracture and fatigue **OR** AE 704 – Deformation and Fracture
23. MME658 – DISLOCATIONS AND PLASTICITY
24. MS603 – MECHANICAL PROPERTIES OF MATERIALS

COMPUTATIONS Basket

1. AE604/AE604A – COMPUTATIONAL FLUID MECHANICS **OR** ME630/ME630A–Computational Fluid Dynamics and Heat Transfer
2. AE605/AE605A– ADVANCED COMPUTATIONAL FLUID MECHANICS **OR** ME634/ME634A: Advanced Computational Fluid Dynamics
3. AE618/AE618A – FINITE ELEMENT METHODS FOR FLUID DYNAMICS
4. AE675/AE675A– INTRODUCTION TO FINITE ELEMENT METHODS
5. AE701/AE701A– NONLINEAR FINITE ELEMENT METHOD **OR** ME676/676A — Non-linear Finite Element Method in Solid Mechanics
6. AE665/AE665A – Finite Volume Methods in Heat, Mass and Momentum Transfer
7. MSE682 – COMPUTER SIMULATIONS IN MATERIALS SCIENCE
8. CHE622 – INTRODUCTION TO MOLECULAR SIMULATIONS
9. CE 615 - INTRODUCTION AI TECHNIQUES
10. ME 752 - OPTIMIZATION METHODS IN ENGINEERING DESIGN

Course Template – M. Tech. (Aero-Thermodyamics and Thermal Sciences)

IIT

Department of Aerospace Engineering

Semester	Non Aero non IIT Students	Non IIT Aero Students	IIT non-Aero Students	IIT Aero Students
Semester I	▪ AE-601A (C) ▪ AE-602A (C) ▪ AE-664A (C) ▪ E	▪ AE-602A (C) ▪ AE-664A (C) ▪ E ▪ E	▪ AE-601A (C) ▪ AE-664A (C) ▪ E ▪ E	▪ AE-664A (C) ▪ E ▪ E ▪ E
Semester II	▪ AE-608A (C) ▪ E ▪ E ▪ E	▪ AE-608A (C) ▪ E ▪ E ▪ E	▪ AE-608A (C) ▪ E ▪ E ▪ E	▪ AE-608A (C) ▪ E ▪ E ▪ E

C: Compulsory course; E: Elective Course

*The electives must be chosen from the given basket.

Course Template – M. Tech.
(Aero-Thermodyamics and Thermal Sciences- Contd..)

Elective Course Basket:

- Aerodynamics I : AE610A
- Measurements in Fluid Mechanics: AE611A
- Aerodynamics II: AE612A
- Viscous Flows: AE614A
- Boundary layer Instability and Transition: AE617A
- Turbulence: AE612A
- Advanced Computational Method in CFD: AE615A
- Finite Element Methods for Fluid Dynamics: AE618A
- Computational Fluid Dynamics : AE622A
- Hypersonic Flow: AE720A
- Explosion and Detonation Physics: AE755A
- Nanoparticle Aerosol Dynamics: AE667A
- High temperature gas dynamics: AE690A
- Aircraft Propulsion: AE652A
- Thermal Turbomachinery: AE653A
- Air Breathing Missile Propulsion: AE657A
- Numerical Modelling of Chemically Reacting Flows: AE658A
- Fundamentals of Combustion: AE663A
- Acoustics in Fluids: AE694A
- Intro to Virtual Instrumentation: AE698A
- Molecular Gas Dynamics: AE747A
- Fundamentals of Liquid Atomization: AE751A