Course Template – M. Tech. in Unmanned Aerial Systems (UAS)

IITK

Department of Aerospace Engineering

Specialization	Abbreviation
Aeromechanics and Design	AMD
Autonomy	ATN

Course Template – M. Tech. (Aeromechanics and Design)

IITK

Department of Aerospace Engineering

Semester	Non Aero non-IIT Students	Non IITAero Students	IIT non-Aero Students	IIT Aero Students
▪ Semester I	▪ AE-602A (C) ▪ AE-610A (C) ▪ AE-670A / AE-688A (C) ▪ AE-xxxA (C)	▪ AE-602A (C) ▪ AE-610A (C) ▪ AE-670A / AE-688A (C) ▪ AE-xxxA (C)	▪ AE-610A (C) ▪ AE-670A / AE-688A (C) ▪ AE-xxxA (C) ▪ E	▪ AE-610A (C) ▪ AE-670A / AE-688A (C) ▪ AE-xxxA (C) ▪ 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

AE-xxxA: Aeromechanics of Unmanned Aerial Systems (course no. to be allocated)

The electives can be from the basket show in next slide, any other elective outside of this basket must be taken in consultation with advisor

Aeromechanics and Design Course Basket

- **Core (Credit: 36+6):** Introduction to Profession and Communication Skills (6 credits) & PG Seminar Course (0 credit)

Core / Compulsory

- **Aeromechanics of Unmanned Aerial Vehicles (AExxxA)***
- Mathematics for Aerospace Engg. (AE602A)
- Aerospace Structural Analysis – I (AE670A) / Dynamics and Vibration (AE 688A)
- Aerodynamics – I (AE610A)

Electives:

- Helicopter Theory (AE686)
- **Modelling and Simulation of UAVs (Modular)* + Experimentation and Flight Testing of UAVs (Modular)***
- **Design and Prototyping of Autonomous Unmanned Aerial Systems (Modular)* + Composites and Applications (Modular)***
- Introduction to Finite Element Methods (AE675A)
- Computational Fluid Dynamics / Finite Element Methods for Fluid Dynamics (AE618A) / Finite Volume Methods for Engineers (SEE619A)
- Flight Stability and Control (AE648)
- Applied Numerical Methods (AE685A)
- Engineering Acoustics and Its Control (ME778)

*New courses with course numbers yet to be assigned

Course Template – M. Tech. (Autonomy)

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-xxxA (C) ▪ AE-602A / CE772A /EE605A (C) ▪ EE-653A / EE-650A /AE-649A (C) ▪ CS-676A / CS-637A /CS-674A (C)	▪ AE-xxxA (C) ▪ AE-602A / CE772A /EE605A (C) ▪ EE-653A / EE-650A /AE-649A (C) ▪ CS-676A / CS-637A /CS-674A (C)	▪ AE-xxxA (C) ▪ AE-602A / CE772A /EE605A (C) ▪ EE-653A / EE-650A /AE-649A (C) ▪ CS-676A / CS-637A /CS-674A (C)	▪ AE-xxxA (C) ▪ AE-602A / CE772A /EE605A (C) ▪ EE-653A / EE-650A /AE-649A (C) ▪ CS-676A / CS-637A /CS-674A (C)
▪ Semester II	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E	▪ E ▪ E ▪ E ▪ E

The electives can be from the basket show in next slide, any other elective outside of this basket must be taken in consultation with advisor

Autonomy Course Basket

- **Core (Credit: 36+6):** Introduction to Profession and Communication Skills (6 credits) & PG Seminar Course (0 credit)

Core / Compulsory

- **Aeromechanics of Unmanned Aerial Vehicles (AExxxA)***
- Mathematics for Aerospace Engg. (AE602A) / Reference Frames Coordinate Frames and Map Projections (CE772A) / Introduction to Signal Analysis (EE605A)
- Digital Control (EE653A) / Basics of Modern Control System (EE650A) / Automatic Control of Aircraft Rockets and Spacecraft (AE649A)
- Computer Vision and Image Processing (CS676A) / Embedded and Cyber physical system (CS637A) / Machine Learning and knowledge (CS674A) /

Electives:

- Autonomous Navigation (AE640A)
- Optimal Control and Reinforcement Learning (AE691A)
- Multiagent Systems: Games, Algorithms, Evolution (CS785A)
- Deep Learning for Computer Vision (CS776A)
- Artificial Intelligence Machine Learning Deep Learning and Its Applications (EE656A)
- **Signal Processing & Communications for UAVs***
- Global Navigation Satellite System (GNSS) (CE674A)
- Lidar and Photogrammetry Laser Scanning and Photogrammetry (CE676A)
- Hardware Security for Internet of Things (CS666A)
- Robust Control Systems (EE654A)

*New courses with course numbers yet to be assigned