



India's #6
Global #263



India's #5
Innovation #5
Engineering college #4

DEPARTMENT OF AEROSPACE ENGINEERING



PLACEMENT BROCHURE 2024-25

ABOUT US *

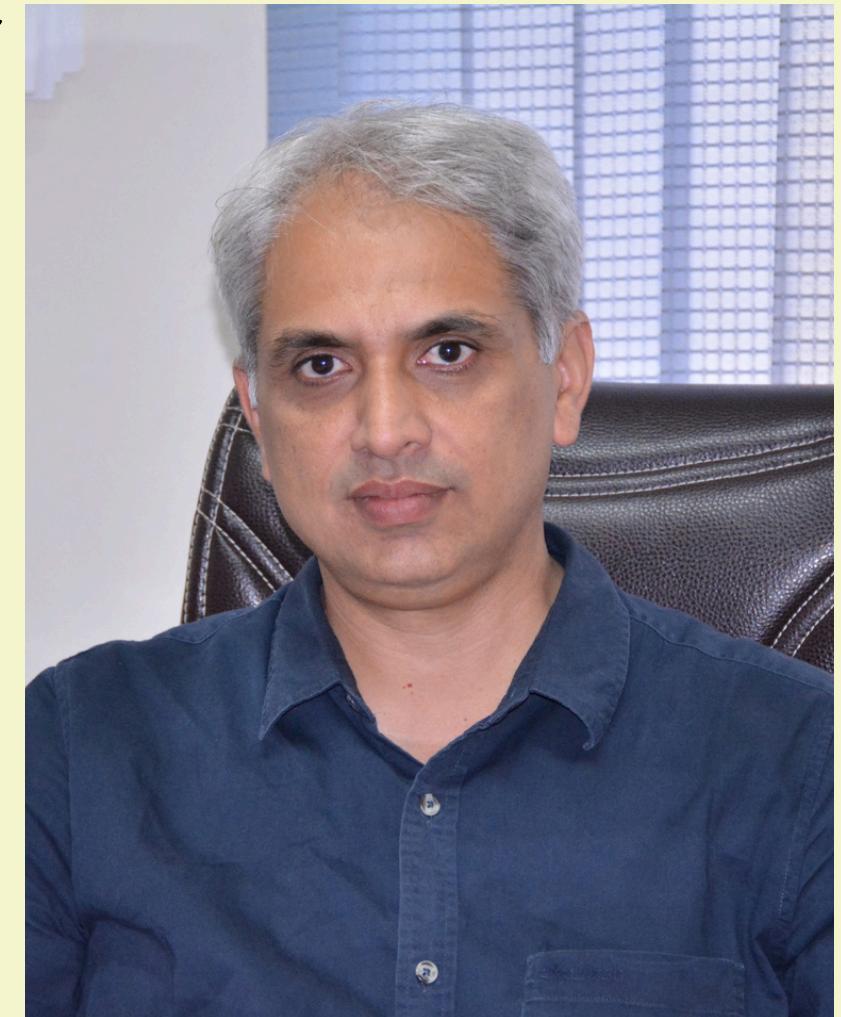
ESTABLISHED IN 1964

Indian Institute of Technology Kanpur (IIT Kanpur) is a renowned public institute of technology in Uttar Pradesh, India, recognized as an Institute of National Importance. Consistently ranked among the top academic institutions in the country, IIT Kanpur has garnered international acclaim, ranking 263rd globally in the QS World University Rankings of 2025 and 6th in India. The institute's legacy is marked by affiliations with numerous distinguished awardees, including recipients of Padma awards and the Shanti Swarup Bhatnagar Prize. IIT Kanpur's reputation for excellence is further highlighted by its impressive performance in the National Institutional Ranking Framework (NIRF) 2024, where it ranked 5th in Innovation, 7th among research institutions, 4th among engineering colleges, and 5th overall in India.

Within this esteemed institution, the Aerospace Engineering department stands out as a premier center for education and research in aerospace technology. The department offers comprehensive instruction in aerodynamics, flight mechanics, propulsion, and aerospace structures, supported by state-of-the-art facilities, including a unique flight laboratory with powered aircraft and gliders. It has forged strong collaborations with national agencies like ISRO and DRDO, contributing to advanced projects and research initiatives. The department's faculty have made significant strides in developing wind tunnels, advanced measurement techniques, and optimized composite structures, reinforcing IIT Kanpur's position as a leader in aerospace innovation and education.

WELCOME ADDRESS

"The Aerospace Engineering Department, with a history of over 40 years, was formerly known as the Aeronautical Engineering Department until 1991. The department maintains a balance between hardware development and theoretical/computational aspects in teaching, research, and development. Currently, the faculty consists of 33 members, sharing four with the Sustainable Energy Engineering Department. The department has undertaken numerous research projects funded by agencies such as Aeronautics R&D Board, ISRO, ADA, DST, HAL, DMRC, NAL, IFCPAR, TERI, PCRA, and DRDO. Faculty contributions span areas like wind tunnels, flow measurements, CFD, aerodynamics, satellite dynamics, thermal rocket propulsion, structural dynamics, composite structures, smart structures, aeroelasticity, wind turbines, and advanced materials modeling.



DR.G.M.KAMATH



DEMOGRAPHY

33

400+

60+

200+

200+

15+

**Faculty
Members***

**Journals
Published in
past 5 years ***

**Ongoing
Sponsored
Projects ***

UG Students

PG Students

Lab Facilities *

DEGREE PROGRAMS

B.Tech

Eligibility:- JEE Advanced Exam
4/5 year program
4 Year - Regular Program, 5 Year - Double Major
In-depth exploration of engineering courses that introduce students to core curricula aligned with contemporary industry demands.

BT-MT Dual

Eligibility:- JEE Advanced Exam
5 year program
Both B.Tech and M.Tech degrees awarded at the end of five years. Students are introduced to core curriculum in bachelors and then they contribute towards research for an year.

M.Tech

(Aerospace & UAS Engg)
Eligibility:- GATE Exam
2 year program
Comprises of rigorous coursework followed by an year of research. Courses often include advanced level group projects and/or individual research project.

M.S(R)

Eligibility:- GATE Exam+ Interviews
2 year program
Similar to M.Tech, with more emphasis on research. Involves fewer course credits and more research/thesis credits. Besides fundamental research, students work on many challenging industrial oriented projects.

Ph.D

Eligibility:- GATE Exam, Walk in Interviews
5 year program
Highest degree awarded by the department for students interested in research careers. Its focus, unlike other degrees, is more towards generating new knowledge than learning extant knowledge.

* -> click here to know more

GATE Paper Code Eligibility for M.Tech program

	SPECIALIZATION/IDS	Eligible GATE Paper Codes
AE	Aerodynamics	AE, CH, ME, PE
	Flight Mechanics	AE, CS, EC, EE, IN, MA, ME, PH
	Propulsion	AE, CH, ES, ME, NM, PE, PH
	Structures	AE, CE, ME, NM, PH, TF
	Aero-Thermodynamics and Thermal Sciences	AE, ME
	Computational Mechanics	AE, CE, ME, PH
UAS	Aeromechanics and Design	AE, CE, MA, ME, NM, PH, TF, XE
	Autonomy	AE, CE, CS, EC, EE, IN, ME

Abbreviations:-

AE-Aerospace Engineering, CH-Chemical Engineering, CS-Computer Science and Information Technology, CE-Civil Engineering, ME-Mechanical Engineering, EC-Electronics and Communication Engineering, ES-Environmental Science & Engineering, MA-Mathematics, PE-Petroleum Engineering, EE-Electrical Engineering, NM-Naval Architecture and Marine Engineering, PH-Physics, IN-Instrumentation Engineering, TF-Textile Engineering and Fibre Science, XE-Engineering Science

Eligible UG discipline for PG program

- Aerospace Engineering
- Applied Electronics and Instrumentation
- Applied Mechanics
- Automobile Engineering
- Automotive Design Engineering
- BS/MS - Physics
- Chemical Engineering
- Civil Engineering
- Computer and Information Science
- Computer Engineering
- Computer Science and Engineering
- Electrical Engineering
- Electronics and Communication Engineering
- Energy Engineering
- Energy Technology
- Engineering Physics
- Environmental Engineering
- Hons. Petroleum Engineering
- Instrumentation and Control Engineering
- Mathematics and Computing
- Mechanical Engineering
- Mechatronics Engineering
- Missile Technology
- MSc - Engineering Physics
- MSc - Engineering Sciences
- MSc - Mathematics
- MSc - Physics
- Nuclear Power Technology
- Robotics Engineering.



ACADEMIC COURSES

Among the 108 courses offered by the department, over 20 have considerable overlap with courses from various other technical disciplines that focus on fluid & structure dynamics, combustion, controls, thermal management.

Department Complusory

- Aerodynamics
- Aeromechanics of Unmanned Aerial System
- Aerospace Structures
- Aircraft design
- Computational methods
- Dynamics and vibrations
- Flight dynamics
- Flight stability and control
- Fundamentals of combustion
- Heat transfer in aerospace applications
- Propulsion

Department Electives

- Acoustics in fluids
- Advanced computational fluid mechanics
- Advanced in wind energy conversion
- Air breathing missile propulsion
- Autonomous Unmanned Aerial System
- Boundary layer theory
- Combustion diagnostics
- Deformation and fracture
- Explosion and detonation physics
- Finite element methods for fluid dynamics
- Helicopter theory: Dynamics and Aeroelasticity
- High temperature gas dynamics
- Hypersonic flows
- Missile guidance and dynamics
- Rocket and missile structures
- Spacecraft guidance navigation and control
- Transition and turbulence

Multi-disciplinary Courses offered by the department

- Composite materials
- Composite modelling
- Computational fluid dynamics
- Flow instability and transition
- Multidisciplinary Design Optimization
- Mechanics of solids
- Multiphase flows
- Rotary wing aeromechanics
- Motion planning and Cooperative control
- Multi-scale models of solid/fluids
- Optimal Non-Linear and adaptive control
- Reduced order modelling and optimization
- Scientific machine learning for fluid mechanics
- Solid Mechanics
- Turbo Machinery
- Turbulence and combustion in gas turbines

Courses from other departments that are opted by students

- Applied Dynamics and Vibrations
- Deep Learning for Computer Vision
- Digital Control
- Multiagent Systems: Games, Algorithms, Evolution
- Global Navigation Satellite System
- Introduction to AI techniques
- Machine Learning and knowledge
- Mechanical properties of materials
- Non-linear Vibration
- Robust Control Systems
- Stability of structures
- Theory of Plasticity
- Wave propagation in solids
- Artificial Intelligence Machine Learning Deep Learning and Its Applications
- Computer Vision and Image Processing
- Damage Mechanics of Composite Materials
- Hardware Security for Internet of Things
- Introduction to molecular simulations
- Lidar and Photogrammetry Laser Scanning and Photogrammetry
- Embedded and Cyber physical system
- Non-linear Finite Element Method in Solid Mechanics
- Optimization methods in engineering design
- Reference Frames Coordinate Frames and Map Projections

SOFTWARES



PROGRAMMING UTILITIES



AERODYNAMICS

Project Domains :-

- Experimental Aerodynamics
- CFD and High performance computing
- Flow Transition and Turbulence Control
- Hypersonic Aerodynamics
- Micro-Scale Fluid Systems
- Acoustics
- Sustainable Energy Systems
- Fluid-Structure interactions



FLIGHT MECHANICS AND CONTROL

Project Domains :-

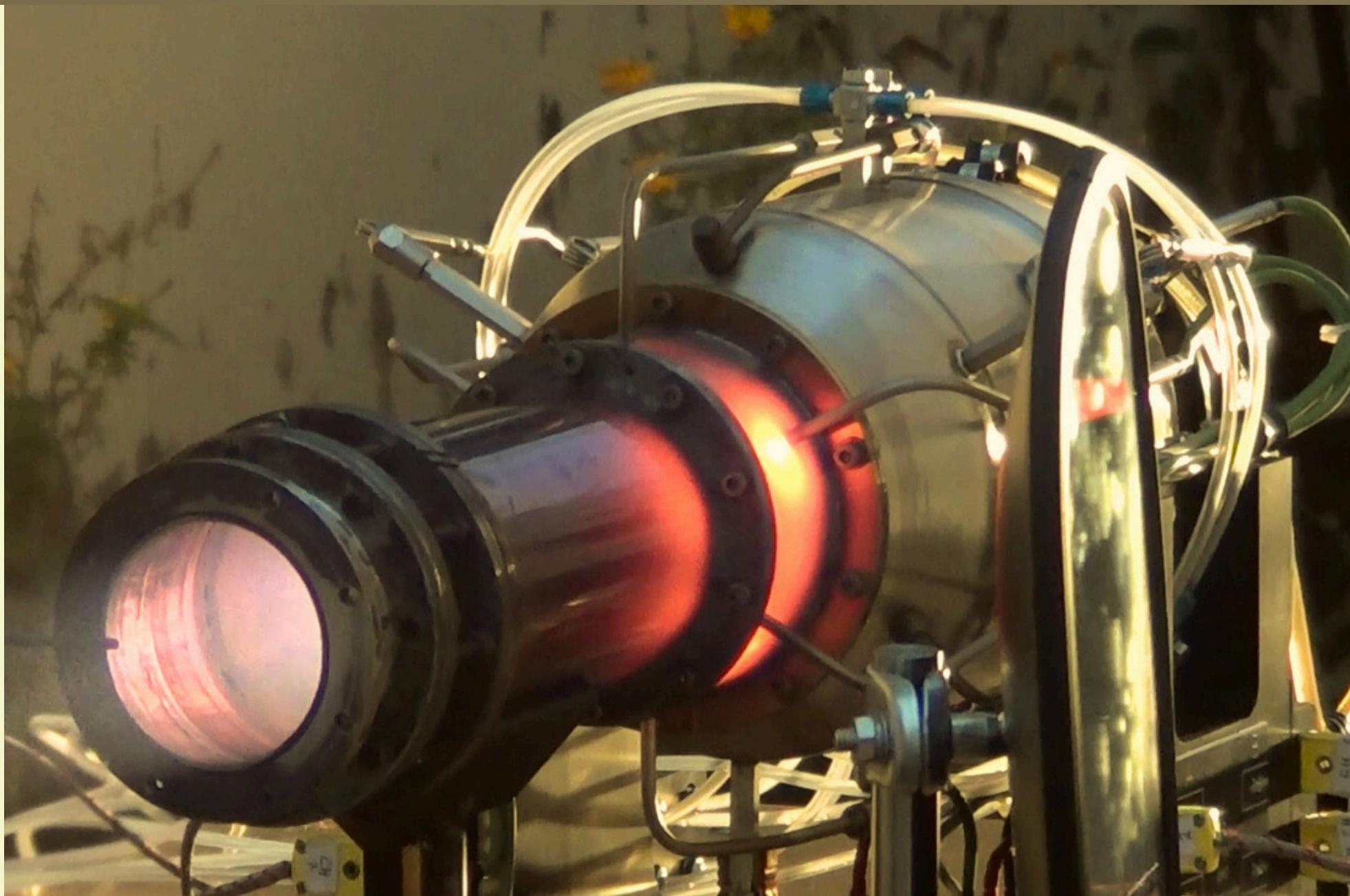
- Design & Control
- Missile Guidance & Control
- Flight Testing
- Instrumentation & Parameter Estimation
- Unmanned & Autonomous Air Vehicle
- Space Dynamics



PROPULSION

Project Domains :-

- Experimental and computational Combustion
- Emission Control
- Intake Aerodynamics
- Internal Flow Control (Active & Passive)
- Flow Diagnostics
- Turbo machinery
- Thrust vectoring
- Electric propulsion
- Liquid atomization and spray combustion



STRUCTURES, STRUCTURAL DYNAMICS & AEROELASTICITY

Project Domains :-

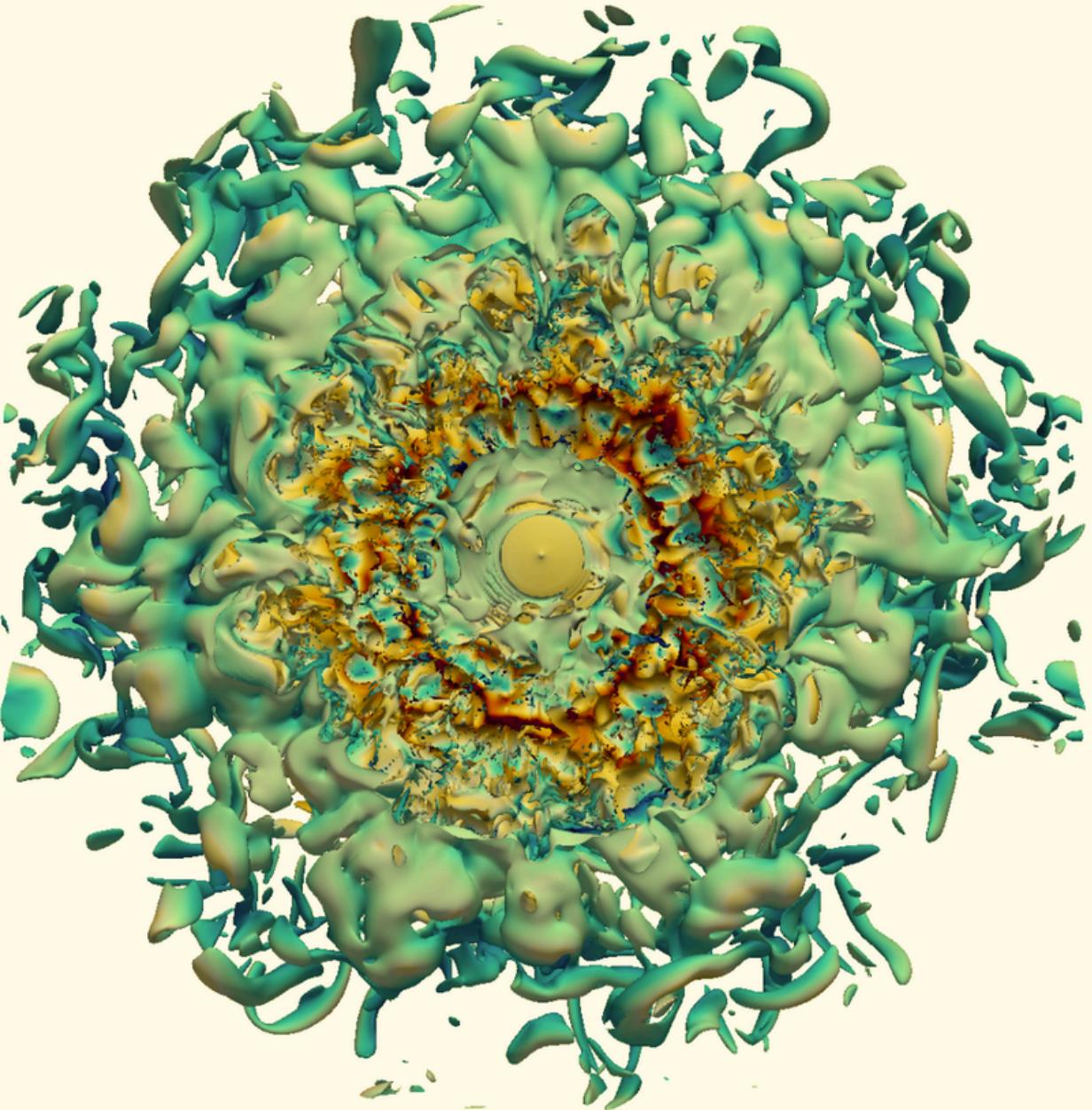
- Material Characterization
- Composite Materials and Smart Structures
- Structural Dynamics and Stochastic Modeling
- Aeroelasticity
- Helicopter Theory (Dynamics & Aerodynamics)
- Structural Design & Optimization
- Damage Modeling
- Design and Dynamics of Autonomous Micro and Mini Air Vehicles



AERO-THERMODYNAMICS and THERMAL SCIENCES

Project Domains :-

- High Speed Flows
- Turbomachinery
- Acoustics and Noise
- Multiphase Flows
- Heat Transfer
- Fire Dynamics
- Detonation & Explosions



COMPUTATIONAL MECHANICS

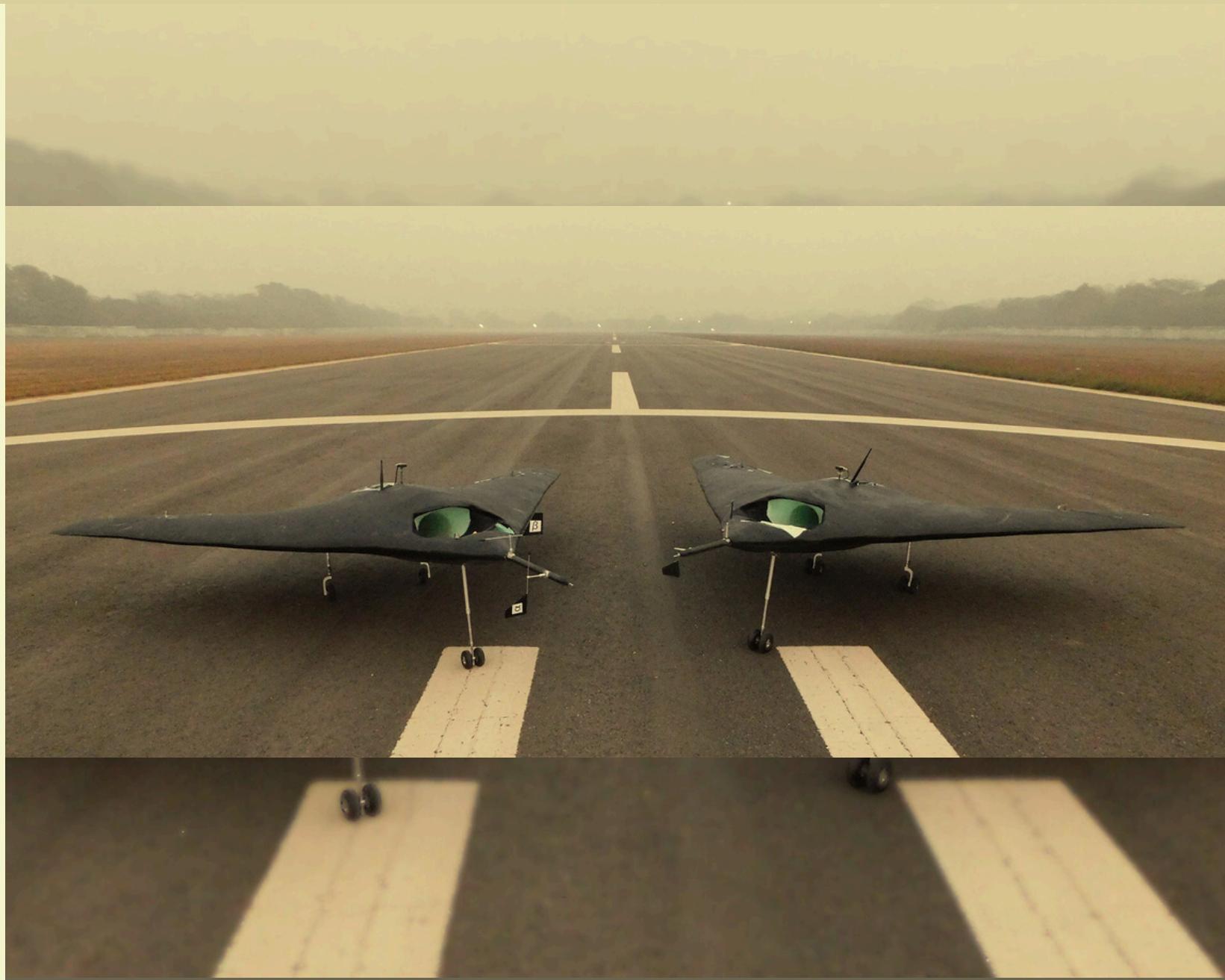
Project Domains :-

- Multiscale models of solids and fluids
- Computational material modeling
- Machine learning and Artificial Intelligence
- Metamaterials including acoustic metamaterials
- Uncertainty quantification and reliability analysis
- FSI: aeroelasticity, Aerothermoelasticity, flutter
- Finite Element Method (FEM)
- Theoretical and computational aeroacoustics (CAA)

UNMANNED AERIAL SYSTEMS

Project Domains :-

- Design and Fabrication of UAV
- Simulation of UAV
- Testing of UAV
- Autopilot and Embedded System
- Computer Vision and Applications
- Planning, obstacle avoidance and vision based localisation
- UAV Communication
- Lidar Photogrammetry Based UAV mapping



MULTI-DISCIPLINARY PROJECTS

Project Domains :-

- Digital Twins and Continuity
- Deep learning based Metamodelling
- Physics Based Predictive models for real time Predictions (PINNS)
- Bio-Medical Applications and Analysis
- GPU and AI-accelerated Computing
- Reduced Order Modelling

LABORATORIES

Teaching Labs

- Low speed Aerodynamics Lab.
- High speed Aerodynamics Lab
- Propulsion Lab
- Structures Lab
- Flight Lab
- Aero modelling Lab
- Design Lab
- Virtual Instrumentation Lab

Research Labs

- Computational Propulsion Laboratory
- Low Speed Aerodynamics Laboratory
- High Speed Aerodynamics Laboratory
- Flight Laboratory
- National Wind Tunnel Facility
- Structural Analysis Laboratory
- Computational Fluid Dynamics Laboratory
- Unsteady Aerodynamics Laboratory
- Helicopter and VTOL Laboratory
- Combustion Laboratory
- Non-equilibrium Flow Simulation Laboratory (NFSL)
- Fluid Dynamics Laboratory
- Advanced Combustion and Acoustics Laboratory
- Advanced Propulsion Laboratory
- Hypersonic Experimental Aerodynamics Laboratory (HEAL)
- Combustion and Propulsion Laboratory
- Space Dynamics and Flight Control Laboratory
- Laboratory for Simulations of Fluids using numericals

EXTRACURRICULAR ACTIVITIES



Aeromodeling Lab

The Aeromodeling is a creative course , which has as main objective the design, building and flying of model airplanes or helicopters. These models can be scale copies of real airplanes or helicopters, or they are specially constructed aircraft models to take advantage of some flying characteristics like speed or duration of flight.

In the Aeromodeling lab, students design, fabricate and fly models. It not only gives a primary introduction to the world of aerodynamics, designing, electronics, engine technology, wood crafting and the technology of new materials but also provides a hands-on experience necessary for developing a practical aptitude.

Society of Aerospace Engineers



The Society of Aerospace Engineers (SAE) is the official body of the Department of Aerospace Engineering IITK.

It is a community of students, Faculty, and staff members which primarily aims at increasing the level of interaction among the members.

Academic activities like organizing industrial trips, workshops, and seminars are an integral part of the society's functioning.

PAST RECRUITERS



TATA ADVANCED SYSTEMS



JPMORGAN
CHASE & CO.



Deutsche Bank



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