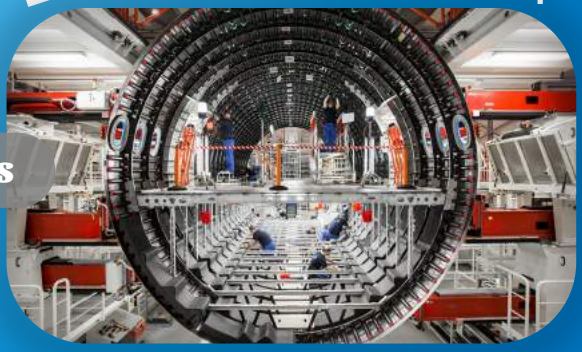
DEPARTMENT OF AEROSPACE ENGINEERING
DEPARTMENT HANDBOOK
BATCH 2019-2021

Aerodynamics

Propulsion

Structures



Dynamics & Controls

CONTENTS

ABOUT DEPARTMENT

Established in 1966-1967 as the Department of Aeronautical Engineering, the department was renamed the Department of Aerospace Engineering in 1992. The department runs strong undergraduate and graduate program in Aerospace Engineering and carries ou research in several areas of Aeronautical and Aerospace Sciences.

The department cherishes the hope that its graduates will be the leaders of tomorrow. Their education is patterned with this in view. Besides making available facilities for higher education, training and research in various fields of engineering and technology, the institute contributes to the industrial development and economic growth of the country by preparing a cadre of engineers and scientists, who provide both manpower and support R&D work for the industries.

The department maintains close links with the aerospace and defense industries and undertakes sponsored research, consultancy, and continuing education programs in diverse areas. The faculty has contributed towards national programs like LCA, IGMDP, and GSLV in various capacities, with spin-off benefits to other fields like biomedical engineering. The department has wide range of experimental facilities such as subsonic and supersonic wind tunnels, water tunnels, stability tunnel, LDV and hot wires, analog and hydraulic simulation rigs, rotor dynamics and engine test rigs, Istron for structure testing, Autoclave for composite fabrication, instrumented drop weight impact test apparatus and an aero-modelling lab, besides extensive computational facilities with excellent network connectivity.

The department aims to provide students with cordial atmosphere and an opportunity to acquire a multidisciplinary perspective to the engineering problems. The department runs academic programs for the degrees of Bachelor of Technology (B.Tech), Master of Technology (M.Tech), Dual Degree (B.Tech and M.Tech) and Doctor of Philosophy (Ph.D.). Four broad area of specialization are offered: Aerodynamics, Control and Dynamics, Propulsion, Structures.

Message from HOD

Department of Aerospace Engineering extends to you all a very warm welcome and thanks you for choosing Aerospace Engineering at IIT Bombay as your choice for postgraduate education. Aerospace Engineering provides exciting opportunities for learning, which I am sure you are looking forward to. We have worked to design the curriculum to give you a right mix of core and elective courses to enhance your understanding of the discipline. A new academic year has begun, bringing it with unique challenges that I am sure all of you will relish. You can turn to your faculty advisors and informally to your seniors in the department for any assistance you may require for settling down. I wish all the very best for your future endeavors.

Prof. Avijit Chatterjee
Head of Department
Department of Aerospace engineering
IIT Bombay

Welcome Note from Faculty Advisors

Dear Students,
Welcome to the Department of Aerospace Engineering at IIT Bombay. Congratulations on your success! The Department has nominated us as your Faculty Advisors and has assigned us the responsibility of monitoring your academic progress. We are your primary point of contact to discuss all the academic and nonacademic matters, where you may need advice/suggestions to make your academic program progressive and your stay on the campus comfortable. All the academic and administrative communications between you and the Institute must be routed through us, which also include approval of course registration for your degree, and recommendation for your leave till you are assigned a supervisor. We will strive to monitor your individual academic progress from time to time and may suggest a corrective course of action when required. Our assignment ends with your graduation from this Institute. You are expected to be in regular contact with us, respond to our calls and communications without delay, and keep us in the loop on all the academic matters. The most effective way of communication with us could be through email, copied to both the Advisors, which could be followed by brief meetings in our office, if required. However, in the case of an urgent situation/ emergency, you may call us on our phone, or visit us in the office without prior intimation. We wish you a very fruitful and a memorable stay at IIT Bombay.

Prof. Prabhu Ramachandran
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Department of Aerospace engineering
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IIT Bombay

WELCOME MESSAGE FROM ISCP

Dear New Entrants,

We take this opportunity to welcome you to one of the most prestigious institutes of the country. We congratulate you on having achieved this feat. With our personal experiences we can vouch that the your stay here at the campus would be exciting. From potential leopard sightings to potential bumping into movie stars all awaits you. Wonderful all night banters, amazing wing cultures and mad birthday celebrations are a few things that you will carry from here when you leave, obviously along with the degree. You will also become a part of a culture where people want to perfect their craft and thus work day in and day out at it. Hence there will be great opportunities to learn both inside as well as outside the classrooms. Thus it is a whole new cosmos to enter and with excitements it might have a few challenges too. We at ISCP (Institute Student Companion Programme) work towards providing you with the hacks to take care of these challenges and have a happy stay with the IIT Bombay family.

The primary objective of the Companion Programme under which the ISCP team works is to build a relationship of trust and comfort between the final year students and the incoming students of the PG programmes. Once this is established life at campus becomes so much easier than what it would have been without it. The knowledge and the experience that the senior batch has gained with their stay at the campus makes the surroundings so much you that the transition becomes smooth. From the lingo on campus to the terminology in the classroom, from the grading to the syllabus, from the profile to placements, from tagda franky to bhindi rice all becomes ingrained so much as if it were you always.

On campus you might always be short on time as there is so much to do and when there is so much to do time flies at sonic speeds. Managing the academics along with extra curricular activities and your social life may seem a daunting task at times. The ISCP programme thus provides you a Student Companion with whom you can share your academic and non- academic problems. These are self-motivated volunteers who want to genuinely help you in tough situation as a giving back act of what they received from the programme.

You can look up to the team for any initial information in things that you are venturing out at be it academics or extra-curriculars, any academic or non-academic issues that you are facing, any sort of support, any requirement that you wanna raise up as a part of the student community and last but certainly not the least just for normal interaction because that is all the programme holds at its core. Come be a part of this immense pool of wisdom and make it more happening and diverse.

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Overall Coordinators
Institute Student Companion Programme (2019-20)

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WELCOME MESSAGE FROM PGAC

Hello Friends,

Congratulations on being selected to be a part of IIT Bombay and a cordial welcome to this new world.

You must have realized by now that you are undergoing a phase of substantive transformation, and this might be daunting for some of you. The academic curriculum of this institution might seem different and perhaps new in comparison to what you were exposed to during your undergraduate education. To appease all the apprehensions that you have, the Post Graduate Academic Council (PGAC) along with the team of ISCP will try to address all the queries that you will be having during your entire Master‟s Programme.

IIT Bombay is known to offer the students a very dynamic environment and a reasonable amount of freedom so that the individual can pursue their heart‟s desire. Be it academics, sports, cultural, or any other activity, you will be finding myriad opportunities to build up your personality and add value to your life. I am hoping that you will be able to explore the unending map of possibilities, push your boundaries, break all the walls and bring out the best version of yourself by the time you finish your Degree Programme.

I wish you good luck and hope to see you around. We are looking forward to interacting with you.

Institute Masters Representative
PG Academic Council

Himanshu Bishwash
Email: imr@iitb.ac.in

WELCOME NOTE FROM ALUMNI

Dear student,

Heartiest congratulations on being admitted to the Department of Aerospace Engineering at IIT Bombay. As an alumnus of the Department, it is a pleasure to welcome you to the family.

Your experience at IITB over the next two years will be influenced significantly by how well you realise and manage what you expect of yourself as well as IITB. Since setting expectations is probably one of the first

things you do while embarking on a new venture, let me offer a few words of advice based on what I picked up at IITB, first as a student and later as a professional.

1. You are an adult by the time you join IITB and you are expected to behave like one (this may sound obvious, but you‟ll be surprised ...). Among other things, it means that you need to look after yourself. IITB has an excellent support system to help you grow in a well-rounded manner and to help you deal with any problem that you may encounter in the process. However, as Prof. Avijit Chatterjee told us on day one, “we are here to help, but you need to come and ask.”
2. The hallmarks of an IIT graduate are her/his technical rigour and killer instinct. We do not turn our back to problems, especially the engineering sorts; we proudly assume responsibility for our actions, even when things go south; and, we are fair in our dealings and more so with our competitors (for the years in IITB , it‟s your classmates competing with you for an AA). These traits are not always innate, but IITB will help you instill and cultivate them in yourself.
3. A good engineer can tackle problems from virtually any branch of engineering. Problem-solving has several univeral characteristics, and IITB‟s academic culture will help you imbibe them. This universality will give you the confidence to tackle new and unseen problems, regardless of where they come from, and to critically assess any solutions that may come your way.
4. Pay attention to your courses, self-study and course/research projects. It is a wide-spread, and mistaken, belief that grades do not matter when you apply for jobs or higher education. On the contrary, you will besought after as much for technical rigour as for discipline and sincerity, all of which are most objectively reflected in your grades. Everything else (MoodI, PAF, Techfest, etc) is typically secondary to your academic performance.
5. IITB has excellent teachers, but their instruction is only as good as your ability to learn and your willingness to put in the necessary effort. In other words, you are responsible for ensuring that you understand and learn.
6. You would do well to avoid the temptation of relegating mundane-looking derivations and calculations to software. You are likely to learn better and faster if you do them by hand. It is my experience that the best (and the best-paid) engineers and scientists prefer pen, paper and black/white board to software.

Finally, as with most other things in life, make the most of your stay at IITB. I earnestly hope that you enjoy it and feel proud of what you achieve there. I wish you the very best of luck - you will need it.

Dr. Aditya A. Paranjape
B.Tech and M.Tech (Batch: 2002-07)
Department of Aerospace Engineering
IIT Bombay

DEPARTMENT LAB FACILITIES

Cardio-Vascular Lab (Prof. S.D.Sharma)
📌 Ground Floor, Aerospace Annex. Building
About Lab: Cardiovascular flow dynamics lab approaches the critical problems in cardio vascular engineering in which fluid dynamics can help solving them. Mainly, flow dynamic studies on Fontan model and investigation of flow through mechanical heart valves in in-vitro left heart model are being conducted
Facilities available: In-vitro human left heart system, ViVitro Superpump
Research areas: Fontan Surgery - to compensate losses in fluid flow during the surgery, Mechanical Heart Valve flow dynamics

Hypersonic CFD Lab
(Prof. Krishnendu Sinha)
📌 Ground Floor, Aerospace Annex. Building
About Lab: The primary goal of this lab is to study high-speed flows in aerospace applications. People here are engaged in theoretical analysis of fundamental flow phenomena, while others develop numerical models of the flow physics. There are other students who apply these computational tools to simulate practical flows. The overall aim is to cover the full spectrum of research – from fundamental physics to real-life applications – and to make a difference in the engineering world
Facilities available: Multi-block grid generation using GRIDGEN, Flow visualization and analysis using TECPLOT, Full power backup of all hardware, High-end graphics workstations for pre and post-processing CFD data
Research areas: Shock-Boundary Layer Interaction, Scramjet intake simulation, Stability of hypersonic flows, Re-entry flow simulation, Shock-turbulence interaction

Control and Instrumentation Lab
(Prof. Arnab Maity)
📌 First Floor, Aero Annex Building
About Lab: The aim of this lab is show students how to apply the theory that they learn in basic control theory in practical situation and also familiarizes with basic sensors used in daily life
Facilities available: Inverted Pendulum, Gyroscope, Industrial Emulator; GPS, Motor Drive and many more Sensors
Research areas: SWAM Optimization, Reinforcement Machine Learning

Aerodynamics Lab (Aerodynamics Faculty)
📌 Basement area, Aerospace Annex. Building
About Lab: For both UG & PG students has been equipped with several experimental facilities that gives first-hand experience to students on experimental aerodynamics of various flows
Facilities available: 2-D Jet setup, Wind Tunnel Arrangements for - Flow over cylinder and Flatplate and Airfoil, Digital Manometers, Instrumentation setup for pressure measurement

Lighter Than Air Systems Lab
(Prof. Rajkumar Pant)
📌 Ground Floor, Aerospace Main Building
About Lab: A Lighter-Than-Air (LTA) Systems Laboratory was set up in 2004 in the Aerospace Engineering Department, in which many R&D and technology development projects related to design, analysis, fabrication and testing of LTA systems have been carried out
Facilities available: Helium Compressor, RF Sealing Machine, Helium Leak Detector, Hot Air Ovens, Universal Testing Machine, Flex Tester, Digital Flammability Tester & Burst Tester
Research areas: Span extension And Inflatable wings for a Morphing Unmanned aerial vehicle (DRDO), Multi-Disciplinary design optimization study system for venus exploration (ISRO), Aerostat Based Last Mile Communication System (Govt. Of Uttarkhand), Elevated Balloon Kite hybrid Platform For Surveillance, Semi-Autonomous Airships

Miniature Aerial Vehicle (MAV) Lab
(Prof. Hemendra Arya)
📌 Ground Floor, Aero Annex Building
About Lab: This Lab is for giving a deep insight on how different aerial vehicle works and also deal with effect of wings shape and is one of the labs that deal with hardware
Facilities available: Bending Machine, Drilling Machine, Different Size of UAV's

Propulsion Lab (Propulsion Faculty)
📌 Ground Floor, Aerospace Dept. Building
About Lab: This lab provides a hands-on experience about various experiments, for both UG & PG students, which are related to propulsion. Experiments related to aero engines, turbo-machinery and heat transfer would give an insight about the basics to the students
Facilities available: Impulse and Reaction turbine setup, Gas turbine engine, experimental setup for the study of heat transfer to gas turbine blade, Setup to measure nozzle thrust and jet reactionforce measurement, Measurement of nozzle pressure distribution

DEPARTMENT LAB FACILITIES

Structures Lab (Structures Faculty)
Ground Floor, Aerospace Main Building
About Lab: The Structures Laboratory in the Aerospace Engineering Department is primarily deals with the experiments which are used to find the material properties and also in the manufacturing of composites. The structures lab has autoclave facility for processing high quality polymer composites as well.
Facilities available: Izod Impact Tester, Universal Testing Machine (Make: LLOYD, Model: EZ 50), Setup for finding Shear Center, Poisson's Ratio, Setup for finding Elasticity Modulus by observing the vibration behavior of the material, experimental setup for Photo-elasticity and Laser Doppler Vibrometer.
Research areas: Research related to fatigue failure in composites, Lightning strike response of Fiber Reinforced Polymers, load mitigation in wind turbine, elastic analysis of beams, plates and shells, Discrete dislocation dynamics, Modelling and numerics of magnetic shape memory alloy.

Shock Tunnel Laboratory (Prof. Viren Menezes)
Ground Floor, Aerospace Main Building
Facilities: "Shock Tunnel" that can simulate a freestream of Mach 8 for Hypersonic Aero-thermodynamic tests. Hypersonic models of 100 mm diameter and smaller can be tested in the test section of this shock tunnel. "Shock Tubes" to study various applications of shock waves.
Research areas: Measurement of forces and moments on hypersonic cruise and re-entry models, Measurement of surface heat transfer rates on hypersonic models, Study of "hypersonic intake", Design and testing of blast mitigation techniques and thermal protection systems, Medical and biological applications of shock waves.

Turbomachinery Research Laboratory
(Prof. A.M. Pradeep)
Besides Aerospace Main Building
About lab: The Turbomachinery Research Laboratory in the Aerospace Engineering Department deals with the Cascade experimentation, low speed axial compressor, contra-rotating axial flow fan studies and turbine exhaust diffuser analysis.
Facilities: Low speed Cascade Wind tunnel, Axial Fan Test Rig, Turbine exhaust Diffuser Rig, Low speed Low Turbulence Wind Tunnel and Contra-Rotating Axial Flow Fan Test Rig.
Research area: Study of tandem bladed compressor under Inflow distortion, stall inspection studies and tip leakage flow physics for low speed axial compressor. Analysis of Part span tandem blade in compressor, Study of contra-rotating fan with tandem blades and Effect of wind milling of rotors in contra rotating fan.

Combustion Lab (Prof. Sudarshan Kumar)
Ground Floor, Aerospace Annex. Building
About Lab: The Combustion Research Laboratory facilitates the development of new combustion techniques to reduce emission from combustion systems. The combustion research laboratory have been equipped with state of the art facilities, which plays crucial role for the better understanding combustion science in order to address scientific and developmental challenges in the defense and aerospace industry
Facilities available: Image based spray diagnosis facility (Nd-YAG Laser, High Resolution Camera, Optical Microscope, 2D Traverse System), Gas chromatograph, Flue gas analyzer, High accuracy electric mass flow controllers with command module, Ultra-low flow rate syringe pumps, High speed camera for flame visualization
Research areas: Electric power generation from microcombustor, Flameless combustion of liquid fuel, Spray combustion, Combustion instabilities in micro scale combustor, Measurement of laminar burning velocity of gaseous and liquid fuels

High Velocity Impact Testing Lab
(Prof. Chandra Sekher Yerramalli)
Ground Floor, Aerospace Main Building
About Lab: This lab in the Aerospace Engineering Department is primarily deals with the experiments which are used to find the high stress testing of armors and ballistics (fast moving projectiles)
Facilities available: Tension Hopkinson bar, Compression Hopkinson bar and Torsion Hopkinson bar, ballistics gun
Research areas: Developing rate dependent constitutive model using high strength strain rate data from Hopkinson bar setup, testing of materials for armors and ballistics.

Acoustics and Flow Diagnostic Lab (High speed aerodynamics Lab)(Prof. Vineeth Nair)
Ground Floor, Aero annex Building
Research areas: study of the interaction of compressible turbulence with the shock waves or detonation wave and its mathematical analysis using the theory Linear Interaction Analysis (LIA), To understand the intermittent sound sources in the flow-field of a bluff-body stabilized turbulent combustor, Double orifice aeroacoustic setup, Analyzing the intermittent sound sources in reacting and non-reacting flow fields

DEPARTMENT FACULTY

Aerodynamics

Prof. J.C.Mandal

Research Interest: Computational fluid dynamics, Computation of Compressible and Incompressible flows, Incompressible two-phase flow problems, Numerical shock instability, Level set Methods
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Prof. Vineeth Nair

Research Interest: Combustion instability, Aero-acoustics, Flow diagnostics, Lagrangian Coherent Structures (LCS), Thermoacoustics
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Website: https://scholar.google.co.in/citations?user=VCn1T34AAAAJ

Prof. R.K.Pant

Research Interest: Design and Development of Lighter-than-Air Systems, Design of an Inflatable Wing for a UAV under a multidisciplinary optimization framework, Self–contained Re-locatable Tethered Aerostat System, Design and Flight Testing of an autonomous airship, Aerial vehicle for operation at High Altitudes, Multi-disciplinary Design Optimization of Multi-lobed Airship Configurations
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Prof. Prabhu Ramachandran

Research Interest: Vortex methods for 2D and 3D fluid flow simulations, Smoothed particle hydrodynamics(SPH), Application of vortex methods to challenging fluid flow problems, Scientific data visualization (using Mayavi and VTK software), Monte-carlo schemes
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Prof. Aniruddha Sinha

Research Interest: Reduced order modeling of flows, Aeroacoustics, Hydrodynamic stability theory, Feedback flow control, Implementing model-based and model-free control of high speed jets, Noise mitigation and mixing enhancement in high speed jets
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DEPARTMENT FACULTY

Prof. Avijit Chatterjee

Research Interest: Computational Electromagnetics, Aircraft design, Radar Cros Section (RCS) analysis of Advanced multi combat aircraft (AMCA) intake duct, Code development for radar absorbing materials for AMCA, RCS of coated cavities in flying wing configurations
Phone: 022-25767128
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Prof. Viren Menezes

Research Interest: Experimental hypersonic aerothermodynamics, Hypersonic test facilities and measurement techniques, Medical applications of shock waves, Drug delivery device, Development of a shock-wave-driven and needle-free liquid-vaccine injector, Effect of surface roughness on hypersonic shock-boundary layer-interactions, Design of a scramjet intake,Effect of surface roughness on the heating rates of hypersonic blunt bodies
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Prof. S.D.Sharma

Research Interest: Cardio-vascular Flows, Experimental Aero-Hydrodynamics with focus on shear flows, Vortical flows, Turbulent mixing, Thermo-acoustics, Drag reduction measurement techniques, Suppression of high speed jet noise
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Propulsion

Prof. A. M. Pradeep

Research Interest: Active and passive flow control, Flow characteristics of internal flows and turbo machinery, Design and performance enhancement strategies in turbo machinery, Experimental aerodynamics, Experimental methods and flow visualization.
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DEPARTMENT FACULTY

Prof. Kowsik Bodi

Research Interest: Modeling and Simulation of High Enthalpy flows and Plasmas (using OpenFOAM), Liquid Metal Magneto-hydodynamics(MHD)
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Prof. Hrishikesh Gadgil

Research Interest: Fuel atomization and sprays, Optical diagnostics of fluid flows, Development of solver for simulation of high enthalpy flows with real gas effects, Simulation of non-equilibrium chemistry, Interfacial instabilities
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Prof. Sudarshan Kumar

Research Interest: Experimental and computational investigations on the flameless combustion of gaseous fuels, Advanced aerothermochemistry, High temperature air combustion, Flameless/mild combustion, turbulent combustion, Modelling of combustion systems, Reduction of pollutant emissions from combustion systems, Combustion in micro-channels
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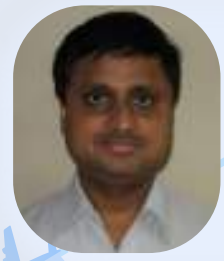

Prof. Shripad P. Mahulikar

Research Interest: Aerospace thermodynamics, Heat transfer & fluid flow, Heat Transfer in hypersonics, Infrared signatures of aerospace vehicles, Microchannel cooling of gas turbine blades, Non-equilibrium thermodynamics
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Prof. Krishnendu Sinha

Research Interest: Hypersonic and high enthalpy flows, Turbulence modeling in high-speed flows, Computational fluid dynamics, high performance computing, Intake aerodynamics for scramjet engines, Re-entry capsule flow physics.
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Structures

Prof. Krishnendu Haldar
Research Interest: Nonlinear continuum mechanics, Modeling of multi-field interactions with matter in continuum scale, Active materials and smart structures, Phase transformation (Magnetic Shape Memory Alloys), Soft material (Magneto Active Polymers), Liquid crystals, Biomechanics, Computational mechanics
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Prof. P J Guruprasad
Research Interest: Damage characteristics in flex-beam like structures for hinge-less and bearing-less helicopter rotor blades, Size effects in crystalline materials, Fatigue in metals and metallic alloys, Development of novel shape memory composite for morphing applications.
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Prof. Amuthan A. Ramabathiran
Research Interest: Multiscale Modeling of Materials, Wave Propagation in Solids, Structural Health Monitoring, Quantum mechanics at the sub-atomic scale, classical mechanics at the atomic scale, statistical mechanics at the mesoscale, and effective continuum models at the macro scale
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Prof. P. M. Mujumdar
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Prof. Chandra Sekher Yerramalli
Research Interest: Fatigue failure in glass fiber reinforced polymer matrix composites, Solid particle erosion modelling of FRP composite, Lightning strike response of carbon fiber reinforced polymers, Load Mitigation in Wind Turbine tower
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Prof. Abhijit Gogulapati
Research Interest: Fluid-thermal-structural-material interactions, Aerothermoelasticity ; Reduced order modeling strategies, optimization, and design; Design and optimization of drone type systems; Aerothermoelastic scaling; Impact of material evolution on coupled fluid-thermal-structural response in extreme environment structures; Reduced order modeling strategies for unsteady aerodynamic systems
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Dynamics & Control

Prof. Hemendra Arya
Research Interest: Control of Micro Air Vehicles, Path Planning and Collision Avoidance, Trajectory estimation and control of fully autonomous Quad- copters, Solar powered miniature aircraft, Ground base autonomous vehicles, Composite laminates and plates analysis, Hardware in loop simulation of Micro Air Vehicles
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Prof. Ashok Joshi
Research Interest: Structural Dynamics, Aero-servoelasticity & Aero-thermo-servoelasticity, Re-entry Guidance, Modelling & Navigation, Guidance and Control of Unmanned Aerial Systems
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Prof. Shashi Ranjan Kumar
Research Interest: Guidance and Control of Aerospace Vehicles, Cooperative Terminal Constraint Guidance, Cooperative Active Aircraft Protection, Finite-time Consensus and Formation Control of Multi-Agent Systems, Obstacle Avoidance and Path Planning, Nonlinear Control and Sliding Mode Control, Aerospace Engine Modelling and Control, Surge Recovery Control, Fault Detection and Diagnosis (FDD), Fault-Tolerant Control (FTC) Algorithms
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Prof. Arnab Maity
Research Interest: Guidance & navigation and control of aerospace vehicles, Optimal control for online trajectory optimization and nonlinear systems, Adaptive control of uncertain systems, Aerospace engine control, Formation flying and swarm of aerial vehicles, Nonlinear and robust flight guidance and control, State and parameter estimation
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DEPARTMENT STAFF

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Mr. Vishal Karnekar	Jr. Superintendent	vishal@aero.iitb.ac.in
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Lab Staff

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Mr Rajesh Gadekar	Technical Superintendent	12047@iitb.ac.in
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Mr Dilip Hadkar	Jr. Technical Superintendent	hadkar@aero.iitb.ac.in

DEPARTMENT FACILITIES & ACTIVITIES

Image Based Spray Diagnostic Facility (Central Instrumental Research facility)

This facility helps in studying characterization of fuel sprays using laser based optical diagnostics. This system works based on the two optical techniques i.e. Particle image velocimetry (PIV) and shadowgraphy technique (backlighting). It is used for the Investigation of combustion phenomenon in flames, burners, jet engines, furnaces, propulsion systems, chemical reactors & shock tubes.
Location- Combustion Research Laboratory, Department of Aerospace Engineering
Facility In-charge: Prof. Sudarshan Kumar
Link for further details: https://rnd.iitb.ac.in/research-facility/image-based-spray-diagnostic-facility

3D Printing Facilities

Aerospace department provides an exclusive facility for Faculty / Students who are interested in 3D printing.
Link for 3D printing facility: https://www.aero.iitb.ac.in/3dprinter/

Department Library

The department Library is an exclusive library that has a good collection of books and journals. It caters to the needs of large groups of users including students, faculty and research scholars. The department library is located in the department office. The library can be used from 10 AM to 4 PM.
Department Library Books link: https://docs.google.com/spreadsheets/d/e/2PACX-1vQDHM0kYEmgaaBnV6AOEWAkPwYFCOCgajDiDdVR3oPRMk2cYlJoVG7eN-tLXHQzr-IJfkTcEG1H-aAb/pubhtml?gid=0&single=true
Anyone can suggest if any book is required. If the relevance of the book is felt enough, the council will try to get that into the library.

Department Study Room

Aero Annex Lecture Hall (ALH) situated in Aero-Annex building can be used as a study room. The timings for study room are from 10 AM to 3 AM (in the night).

Student Satellite Team

The IIT Bombay Student Satellite Project is a landmark project taken up by IIT Bombay students. The first satellite PRATHAM under this project was launched on board the PSLV C-35 on 26th September 2016. Currently, the Team is working on Second Satellite ADVITIY.
Link for further details: https://www.aero.iitb.ac.in/satlab/

Team Rakshak

Team Rakshak is an IIT Bombay student initiative to develop a fleet of robust Unmanned Aerial Vehicles (UAVs) to support Search and Rescue Operations (SRO) in the event of disaster. These aircrafts can provide relief measures in disaster-stricken area.
Link for further details: https://rakshakiitb.github.io/

Team ExoFly

Main aim of the team is to design and build a safe, quiet, ultra-compact, near-VTOL personal flying device capable of flying 20 miles while carrying a single person.
Link for further details: https://www.facebook.com/ExoFlyIITB/

Aerospace Centers

National Centre for Aerospace Innovation and Research (NCAIR)

NCAIR is a collaborative consortium of the Indian aerospace manufacturing sector providing research and technology to its members with a vision to create a world class aerospace manufacturing ecosystem in India. It serves as a catalyst for collaboration between Industry, Academia, Research & Development organizations, and Government with an aim to provide economically viable and sustainable solutions to the Indian aerospace manufacturers by promoting Innovation, Knowledge Creation, Entrepreneurship, and Dissemination of know-how. link: http://ncair.in/

(NCAIR)

Centre of Propulsion Technologies (CoPT):

A centre of propulsion technology has been established, with DRDO funding, with IIT Bombay as the host Institute and a few institutes of national importance. The centre aims at spearheading fundamental and applied research in areas related to aerodynamic design and performance analysis of various components and technologies associated with aerospace propulsion devices. Centre also aims to

• Create knowledge database for areas related to gas turbines and other aero propulsion technologies

• Train students (M.Tech, Ph.D, Post-docs) in areas related to aero engine and propulsion technology

Professor In-charge: Prof. A.M.Pradeep

For more details visit: http://www.copt.iitb.ac.in/

Highlights of the Department (2018-19)

Prof. R.K. Pant, Department of Aerospace engineering has been awarded the President of India's prize by Institution of Engineers at the 32nd Indian Engineering Congress held in Chennai for his paper titled "Design, Fabrication and Testing of Mooring Masts for remotely controlled indoor and outdoor airships".

Ph.D scholar Pallavi R. (Roll no. 154010008, Category: Institute TA) successfully defended Ph.D-thesis in record fastest time from Aerospace Department i.e. in 2-yrs 10-months. The field of her PhD research was Irreversible Thermodynamics. PhD-research of candidate resulted in 4 published journal articles so far, with only the student & guide as two authors.

Ministry of Human Resource Development, Ministry of Defence and Ministry of Civil Aviation announced a student competition naming Aerospace Technologies for the Betterment of the Billion lives (AABB) to exhibit products / concepts / innovative ideas on aerospace technologies at Aero India 2019. Finally selected candidates exhibited their product / concept at the “Student Pavilion” at Aero India 2019. This was the 1st ever Students Pavilion in Aero India.

Aeromodelling Club in Collaboration with Techfest conducted **Boeing National Aeromodelling RC Plane Competition**, where participants Build their own RC Plane and compete for the top spots in the final competition in December 2018.

For more information: https://www.aerotrix.com/boeing-competition-2018

Research Seminars

Presenting, listening and debating scientific ideas are an essential part of a research. To provide an opportunity to cultivate and incubate this culture, the department conducts very useful seminar series. Seminar talks are held frequently where the speakers include faculty and senior PhD students who present their research work and other students who present scientific ideas or papers. Throughout the year, the Aerospace department also hosts seminars by inviting various eminent individuals known for their contribution to academics or industry. These speakers interact and impart their knowledge and experience to the students, encouraging the students to take on more challenges. Few of such seminars given in the year 2018-19 are presented below. Please find Abstract of Topics of all these seminars here: https://drive.google.com/drive/folders/1x2Qhr_I7uyKksUGylVQkNKUZLqy4WYHq?usp=sharing

Live webcasting of SAROD 2018 was organized in Aerospace Department on 29th & 30th Novembar 2018. **Symposium on Applied Aerodynamics and Design of Aerospace Vehicles (SAROD)** is a platform to share the experiences of aerodynamicists involved in aerospace vehicle design in India as well as abroad. SAROD 2018 is being organized by ADA in association with GTRE and CSIR-NAL under the aegis of TAAI (Trust for Advancement of Aerodynamics in India).
Know more about SAROD: http://sarod.taai.org.in/

Workshop on "**Autonomous and Cyber Physical Systems : Emerging Importance of Data**" was held on September 07-08, 2018 at IIT-Bombay. This workshop was conducted by Automatic Control and Dynamic Optimization Society (ACDOS).
Organizing Committee: Prof.Arnab maity and Prof.Shashi Ranjan Kumar, Aerospace department
Link: http://www.acdos.org/ and https://www.ifac-control.org/

The **Defence India Startup Challenge (DISC)** was formally launched in August 2018. It is part of **Innovations for Defence Excellence (iDEX)**. DISC is an initiative by Defence Innovation Organization (DIO), under the aegis of the Ministry of Defence, Government of India, in partnership with Atal Innovation Mission. The initiative aims at supporting innovators to create products/solutions based on advanced technologies in area of national security through an equity linked grant-based mechanism. SINE IIT-Bombay is one of the Partner Incubators for the iDEX.
For more information, visit following link: http://aim.gov.in/idex/

Ph.D. & Research Opportunities

IIT Bombay has signed MoUs with several universities abroad for **Student exchange programmes**. Students of IITB interested in participating in exchange programs with international universities can do course work and/or project work at an Institution with which IITB has an MoU. There are separate schemes for student exchanges and research work, the details of which are available under list of MoUs here: http://www.ir.iitb.ac.in/?page_id=137
Find more information here: http://www.ir.iitb.ac.in/?page_id=396

The **IITB-Monash Research Academy** is a major Australian-Indian research collaboration formed between IITB and Monash University. Monash University is Australia's largest university with a global reputation for making an impact and challenging the status quo. The PhD program at IITB-Monash Research Academy allows graduate students from India to work with both IITB and Monash supervisors, as well as industry partners. Spending at least one year in Australia, students graduate with a joint PhD degree from IITB and Monash University, ensuring a truly global experience, setting them up for future career success. For further details, please visit: http://www.iitbmonash.org/

Tata Centre for Technology and Design (TCTD) at IIT Bombay was established in 2014 with support from the Tata Trusts. The Tata Centre acts as a virtual centre for teaching and research that draws faculty members and graduate students from various academic units across IITB. The centre focuses on challenges in the areas of Agriculture and Food, Education, Energy, Healthcare, Housing, Water and Waste Management. To know more about different project under Tata centre, please visit: http://www.tatacentre.iitb.ac.in/

Aerospace Engineering department at **Embry-Riddle Aeronautical University, Daytona Beach, Florida** offers Ph.D. program in many research areas like multidisciplinary design and optimization, aeroelasticity, vibration control, impact analysis of composites and ceramics, and additive manufacturing. The chances of getting funding (tuition waver plus research or teaching assistantship) for the PhD program are good here. **Dr. Mandar Kulkarni** who is a distinguished **alumnus of Aerospace department, IITB** is a Professor in this university. For more details, please visit: https://erau.edu/

University of Central Florida (UCF), Orlando, FL provides opportunity to obtain Ph.D in Aerospace engineering. They provide many financial aid opportunities to Ph.D students. **Prof. Subith Vasu** is an Associate Professor in this university. His research interests is in the areas of energy science, combustion chemistry, chemical kinetics, and laser diagnostics. His research is funded by various government agencies and industries. For further details:
http://www.mae.ucf.edu/mmae/Research/VasuLab/?news
https://www.ucf.edu/

Ministry of Human Recourse Development(MHRD, Government of India, launched the **Prime Minister's Research Fellows (PMRF)** program for direct admission to the PhD program at IISc and IITs. This program also gives opportunity to student pursuing or have completed M.Tech. / MS by Research at the IISc/IITs/IISERs. More details may be found on the PMRF website at https://pmrf.in/

Learn Foreign Languages

IIT Bombay has been conducting the foreign language courses from academic year 2004-05. Languages taught are German, French, Chinese and Japanese. All the language courses will run in two separate modules of 50-50 hours each in two semesters: Module 1 in Autumn semester and Module II in Spring semester. The registration procedure, fees and deadlines are given in detail, every year before the commencement of the course, in an advertisement sent out from the Office of Dean-IR.
For further details about language courses, please visit: http://www.ir.iitb.ac.in/?page_id=30
Chinese (Mandarin): http://www.ir.iitb.ac.in/?page_id=440
French: http://www.ir.iitb.ac.in/?page_id=22
German: http://www.ir.iitb.ac.in/?page_id=24
Japenese: http://www.ir.iitb.ac.in/?page_id=28

Entrepreneurship Opportunities

The institute has designed and developed mechanisms and bodies to help create new enterprises that employ technologies developed by its faculty and students. While entrepreneurship has always been an integral component of IITB's student activities, the Institute has been making focused efforts on the challenge of creating a thriving entrepreneurial ecosystem on the campus building on several initiatives that have been launched over the last ten years.

Society for Innovation and Entrepreneurship (SINE): SINE is an umbrella organisation at IIT Bombay for fostering entrepreneurship and nurturing tech start-ups. It administers a business incubator which provides 'Start to scale' support for technology based entrepreneurship and facilitates the conversion of research activity into entrepreneurial ventures.
SINE provides up to 3 years incubation support to startups from varied technology and science areas.
Location: SINE, 3rd Floor, CSRE Building, IIT Bombay
Know more about SINE, please visit: https://www.sineiitb.org/sine/home

Desai and Sethi center for entrepreneurship: The D S Centre for Entrepreneurship is actively working towards the following objectives:

- To train and develop entrepreneurs to have a positive impact on society
- Establish facilities, provide educational programs and offer micro-grants to nurture new ideas in advanced technologies
- Create, redefine and build cutting-edge products and services
- Provide support (Content, Context and Contacts) to all the students and faculty in their entrepreneurial initiatives

For more information, please visit: http://www.iitb.ac.in/dsce/

Entrepreneurship Cell (E-cell): E-Cell is a student organisation which motivates students to bring out their latent spirit of enterprise. It works throughout the year, showing students the opportunities that lie within their grasp and the path they can take to make a difference. Its initiatives include Eureka (annual international business plan competition), Ideaz (Pan IIT business idea contest), E-Summit (entrepreneurship summit), EnSpace (a newsletter) and ECampaign (nationwide entrepreneurship drive).
For more details, please visit: www.ecell.in

Placements

At IIT Bombay, every Department/Center has equal and many opportunities in placement seasons every year, which has made our institution outstanding in terms of on-campus placements statistics. Aerospace has a reputed and glorious past. Most students are placed in firms they like and profiles they preferred. Year 2018 marked the highest placement record for the Department. Therefore, as the years go by, Aerospace is making its mark, and the students are making this possible year by year. In addition, probable placement of a student entirely depends upon the students interest area, caliber and the amount of efforts he/she puts in for it. ***So, a suggestion to the incoming batch of students is to start thinking and explore about how they would like to utilize courses and the facilities offered by the institution for themselves.*** We see recruiters coming from a number of sectors- Core, Data science, Finance (Banks), Health Care, Retail, Technology Startups, Information Technology, Automobile/Production, Machine Learning, Supply Chain Management to name a few. Student alumni of this branch are placed in the most reputed companies. Every company has provided good profiles and salaries.

Past Recruiters

Aerospace PGs in Institute Cultural

Every year AEROSPACE Department is blessed with students having plethora of talents. The diversity in AEROSPACE is not just only in terms of academics, but also in the cultural talents of the students. AERO students have shown enthusiasm in every genre like dancing, dramatics, photography, fine arts, speaking arts etc. To keep the cultural atmosphere going, a number of events take place at institute and departmental level. With each year passing by, the participations and achievements at the PG cultural events is on the rise. Our department also created history by winning the first time overall PG Cult trophy in year 2017-18.

Aerospace Department Achievements in the year 2018-19 are as follows:

- Aerospace has won the first prize in Spin the Yarn
- Second prize in Do the Moods, Pot Painting, Wall painting and Ad-making
- Third prize in T-Shirt Painting

You can get detailed info about the PG cultural at Facebook page of Aerospace Cult VYOM Club.

Follow us on: https://www.facebook.com/CultAero/

To know more about IITB-Culturals, please visit https://gymkhana.iitb.ac.in/~cultural/

Aerospace PGs in Institute Sports

AEROSPACE Department has always been active in sports. PG Sports witnesses the confluence of sports enthusiasts and celebrates excellence, endeavor and team spirit. This is a much needed diversion from the rigorous routine academics, bringing with it promises of an energizing and exhilarating experience. AEROSPACE ended up with good participation in the PG Sports for the year 2018-19. Students had shown great enthusiasm towards Badminton, Football, Cricket, Cycling, Lawn Tennis, Athletics, swimming etc. It was not just about winning all the time but having some great time playing together, making great memories that lasts forever and trying to give our best. This year Aerospace participated very enthusiastically in various sports events of PGGC.

Aerospace Department Achievements in the year 2018-19 are as follows:

- Silver medal in Athletics, 1500 m, Boys category
- Boys Basketball Team Secured Silver medal in PGGC
- Bronze medal in Aquatics, 50 m Backstroke, Girls category

To know more about IITB-Sports, please visit https://gymkhana.iitb.ac.in/~sports/

Facebook page of IIT B PG Sports: https://www.facebook.com/iitbpgsports/?ref=br_rs

HOW TO CHOOSE SUBJECTS

One of the biggest dilemmas facing a new student is “How do I choose which subject to take”.While interest of a student and aptitude are the most important, the following information would help you to decide on your courses as well.

Subjects for M.Tech. can broadly be grouped into 4 types:

- Compulsory Graded Courses: These subjects are to be compulsorily taken during the course.
- Compulsory Non Graded Courses: This is the Communication Skills course being offered. Though compulsory, it is non graded. It consists of two parts – one being taken by the department and one by the institute.
- Electives: Apart from the compulsory courses you will have to register for electives which can be chosen from other departments. You will have to choose electives from the list approved by the Department.
- Institute Elective: These are non-engineering courses offered by various departments. These are graded and will be reflected in your final Grade sheet. You will have to choose electives from the list approved by the Institute.

Content: Course content / syllabus for every subject is available online at https://asc.iitb.ac.in (ASC website) along with the name of the professor offering it.

Grading: If you want to know the previous year grading statistics you can check on ASC website.

Audit: A student wanting just an exposure to a course, without obtaining a grade, then he/she may audit a course. The minimum requirement is 80% attendances, with any additional requirements as set by the instructor such as submission of assignments and minimum performance in some of the in-sem evaluations.

Project: If you have selected your Guide early enough and/ or have decided on your Project, it is advisable to take the advice of your Guide for choosing your electives in line with your future Project.

GRADING CRITERIA & RULES

Letter Grade	Grade Points	Letter Grade	Grade Points
AP	10	FR	0/Fail (Repeat the Course)
AA	10	DX	Fail due to lack of attendance
AB	9	II	Incomplete
BB	8	DR	Dropped
BC	7	PP	Passed
CC	6	NP	Not Passed
CD	5	AU	Audit
DD	4	W	Withdraw
		FF	0/Fail (Re-exam is permitted)

1. The total minimum credit requirement for the entire programme varies from one programme to another and may be in the range of 156-170 credits.
2. The academic system in IIT Bombay is based on credits. For every course taken by the students, he/she is assigned a letter grade on his/her combined performance in all the assessments. These grades are described by the following letters and corresponding grade points:
3. Minimum passing grade for a course is DD.
4. Once you get fail grade (FR) in 2 or more subjects, there is a real possibility that it could lead to your expulsion from the institute.
5. A student getting a FR grade has to re-register for the same course if it is a core subject. If this course is an elective course, he/she may register for an alternative course as prescribed by the DPGC/ IDPC/SPGC, without this being counted as an additional course.
6. There is a provision of taking a course as 'AUDIT' with due permission taken from the concerned faculty. The difference between taking a course as audit compared to credit is that it helps the student to sit through all lectures without having to commit too much time (in terms of assignments, exams, etc.) to meet the requirements for getting an audit grade ('AU'). The requirements for getting an audit grade is decided solely by the professor offering the course and will typically involve getting a certain pass percentage.
7. The last date for dropping a course by the student will be two weeks after the mid-semester examination for the semester-long courses and one week after the mid-semester examination for the half-semester courses. The last date for course drop will be included in the Academic Calendar.
8. Within the period prescribed in the Academic Calendar, a student can substitute one or more courses by others. For this purpose, the student has to carry out course Adjustment in consultation with his/ her Faculty Advisory Group

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Ph.D Student's Research Topic

Ph.D. Students & their Research Topic:
https://drive.google.com/drive/folders/1sVZgLhO7LbgY2_ZkNlJZ2_auiaM45HwS?usp=sharing

Research Thesis (of previous years):Many of the students wonder about the kind of research that goes in the department. To know about the research projects undertaken by the students in previous years, one can follow the below link for the abstract of all the research thesis. The link is maintained by the Central Library. It contains the abstracts of dual-degree, masters and doctoral thesis. If anyone finds any topic interesting and wishes to read the thesis, they can go to the department library where all the research thesis (dating back to 1970s) are available. One can ask Mr. Bandsode and after certain procedures, get a digital manuscript of the desired thesis. http://etd.library.iitb.ac.in/etd/Etd_View.jsp(It can only be accessed on IITB server. So, one might need to use a VPN if accessing the link from outside IITB)

Distinguished Alumni of Department of Aerospace Engineering

Mr. Arjun Divecha
(B.Tech , 1979)
He is currently the Chairman of GMO (Grantham, Mayo, Van Otterloo & Co), USA. He obtained MBA in Finance from Cornell University in 1981. Mr. Divecha is the Founder-Director of The Divecha Centre for Climate Change, located at the Indian Institute of Science, Bangalore, and a board member of the Bay Area chapter of Pratham.

Mr. Vikas Tipnis
(B.Tech , 1974)
He is currently serving as Enterprise Architect in Celgene. He was the founder of TMC Associates and worked in lot of different domain. He also served as Adjunct Faculty in Department of information systems, New Jersey Institute of Technology(NJIT). He obtained M.S. degree from Cornell University, USA.

Mr. Sanjai Kohli
(B.Tech , 1979)
He is a Co-founder and Chief Technology Officer at SiRF Technology Inc., USA. He is also a Co-founder of two more successful companies WirelessHome(WH) and TrueSpan. He was named the "Inventor of the Year" by the European Union in 2010. He received M.S. in Systems Science from Washington University in 1981.

Dr. K.Sivan
(Ph.D. , 2006)
He is currently the Chairman of Indian Space Research Organization. Dr. Sivan has contributed significantly in PSLV, GSLV and GSLV Mk-III vehicle design. He published a book in Nov 2015 "Integrated Design for Space Transportation System" published by Springer.

Prof. Nikhil Ashok Koratkar
(B.tech , 1995)
He is currently the John A. Clark and Edward T. Crossan Endowed Chair Professor of Engineering at Rensselaer Polytechnic Institute in USA. He obtained his M.S. and Ph.D. degree in Aerospace Engineering from the University of Maryland, USA in 1998 and 2000, respectively. He has received USA National Science Foundation CAREER Award in 2003.

Dr. Deepak Patil
(B.Tech 1977, M.Tech 1979, Ph.D. 1985)

He is currently serving as a President and CEO of Interactive Spectrum. He has been the co-Founder, President and CEO of eVizeon India; MD of VeriFone India Ltd.; and GM heading the Technology Center in IBMGlobal Services, India (earlier TISL). Dr. Patil was MD & CEO of Edgesoft India Pvt. Ltd. And also served as the Vice President for Global Delivery Integrated Business Operations in IBM.

Mr. Aditya Paranjape
(Dual Degree , 2007)

He is currently working as a Scientist in Control Systems, Tata Consultancy Services Limited. He served as a Lecturer in Imperial College London, UK (2017-18). He also served as an Assistant Professor at IIT Bombay (2015-16) and McGill university, Canada (2014-15). He obtained his Ph.D. in Aerospace engineering from University of Illinois, USA.

Dr. Kota Harinarayana
(Ph.D. , 1984)

He was honored with Padma Shri by Government of India in 2002 for his contribution as a Programme Director and Chief Designer of Light Combat Aircraft (LCA). He was formerly Vice-Chancellor of University of Hyderabad and also served as President of Indian Aeronautical Society.

Mr. Jay Lala
(B.Tech , 1971)

He is currently working as a Senior Principal Engineering Fellow at Raytheon Company, San Diego, California. He completed his M.S and Ph.D. from Massachusetts Institute of Technology.

Dr. Lalitesh Katragadda
(B.Tech , 1990)

He is the Founder of Indihood.com (Hyperlocal crowdsourcing activating communities), Founder - Swaja Labs (Affordable Smart Devices for internet access); CPO of Avanti Finance (Improving Credit Access for the neediest); and Advisor to the Ministry of Electronics & IT MEITY, Ministry of Finance and the Department of Telecommunication(DOT).

Useful Information & Important Websites

Application Software Centre (ASC) – Administration

https://asc.iitb.ac.in/

This website is the main interactive website for a student for all of his/ her's administrative
requirements. From paying your fees to checking your grades, all can be done on this website.The website also has links to all other websites of the institute. Some of the most importantfacilities offered by this website are given under:

- Payment of fees
- Registration and de-registration from courses
- Checking previous years' grades awarded in any subject
- Brief contents of any subject being offered
- Own personalized timetable
- Checking of own academic performance (grades)

Moodle-Academics

https://moodle.iitb.ac.in/

This website provides academic interaction between students and faculty for all courses enrolled by a student. You can download study material/ books/ notes uploaded by a professor/ TA and also submit projects etc here. The website also offers a interaction platform where you can interact with the Professor/ TAs/ other students on any subject related matter.

webmail

https://webmail.iitb.ac.in/

This is your personalized e-mail in IIT. Every student gets one when you enroll. Along with normal mails, here you also get alerts for registration/ de-registration of courses, fees payment and any broadcast on moodle among others. You have to regularly check (5-6 times a day) GPO to get updated.

Library

https://www.library.iitb.ac.in/opac-search/

The website for the central library offers a search engine for books available in the library. You can also check the number of books issued at any given time, renew them and "queue" up for any book already drawn by some other individual.

AEROSPACE

https://www.aero.iitb.ac.in/home/

Our department's website, it has the contact details of all faculty members, staff and students of our department. It also displays the academic research areas of the department.

Useful Information & Important Websites

Attendance & TA Duty

Attendance for regular classes is generally taken by the concerned professor during lecture hours, either by biometrics or on paper. Attendance for TAship is to be given for every working day biometrically. TA duty will begin immediately after joining the course. The faculty advisor will appoint TA duty to all the M.Tech entrants. Once allocated, the students should report to the respective TA supervisor immediately for the assigned work.

Leave Taking

For taking a leave, leave application should be submitted to office one week before its commencement. Permission is needed from the TA Guide or faculty advisor. Total official leaves for TAs are 15 days in a semester.

Instiapp

Instiapp is an app available in play store for navigation within the campus. From the app, one can easily locate all the hostels, academic sections, residential areas and other infrastructures present in the Institute.

Gymkhana

Gymkhana is an organization to foster and develop all student activities in the institute. Pleas visit https://gymkhana.iitb.ac.in/ for more information.

Cultural Clubs you can join

IN SYNC (Dance Club), Fourth Wall (Dramatic Club), SILVERSCREEN (Film and Media Club), SAAZ (Hindi Music Club), TACCATO (Western Music Club), RANG (Fine Arts Club), PIXELS (Photography Club), Literati (Literary Arts and Quiz Club), Book Club and VAANI (SpeakingClub)

Students Technical Activities Body (Technical Clubs)

http://www.stab-iitb.org/

STAB encompasses various technical clubs like Technovation, Aeromodelling Club, ElectronicsClub, KRITTIKA—the Astronomy Club, Maths and Physics Club, The Robotics Club, WnCC—Weband Coding Club, Tinkerer’s Lab

IIT B Racing Team

https://www.iitbracing.org/

IIT Bombay Racing is India's premier Formula Student Electric team with a vision to "Revolutionize Electric Mobility in India focusing on sustainable technologies and innovations".

Umesh Meshruwala Innovation Cell (UMIC)

http://www.umiciitb.com/

Enables students across IIT-Bombay to come together to develop technological innovations and participate in national and international competitions which includes Self Driving Car, Intelligant ground vehicle,Autonomous Quadcopters etc.

Software center: https://www.cc.iitb.ac.in/
Free Softwares for students: https://www.cc.iitb.ac.in/page/services-software
How to setup Wifi in Laptop: https://www.cc.iitb.ac.in/page/n-wired
Connect GPO (IITB email interface) with G-mail: http://homepages.iitb.ac.in/~yatindestel/docs/GPO%20in%20Gmail.pdf
Official site of IIT Bombay: http://iitb.ac.in/en/about-iit-bombay
ISCP: https://gymkhana.iitb.ac.in/~scp/scp/index.html
student activities: https://gymkhana.iitb.ac.in/
Sports affairs: https://gymkhana.iitb.ac.in/~sports/
Hostel affairs: https://gymkhana.iitb.ac.in/~hostels/
SARC: http://www.sarc-iitb.org/#
Buy and Sell: https://www.facebook.com/groups/buysell.iitb/

Emergency numbers:

Note: The numbers inside the brackets are extension numbers. If you are calling from a landline inside IIT Bombay, use only the 4 numbers in the brackets.
Ambulance: 022 – 2576 (1101/1110)
Hospital: 022 – 2576 (7051)
Main Gate: 022 – 2576 (1123)
Y Point Gate: 022 – 2576 (1121)
Security: 022 – 2576 (1100)
Quick response team: 9167398598/ 9167398599/ 9833337979/9833338989

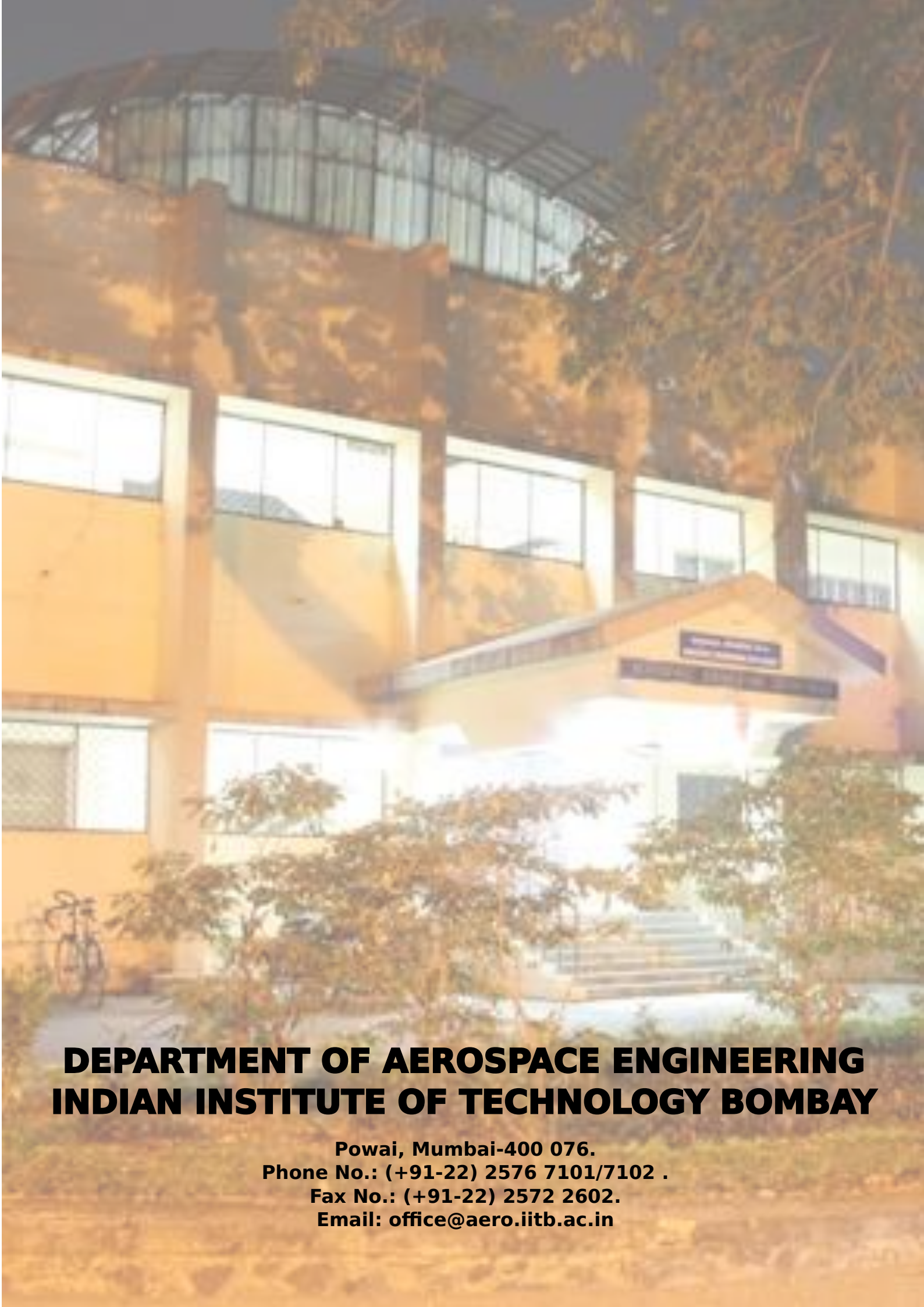
You have reached the end of the document.
You are now all set to kick-start your wonderful 2 years of life at IIT Bombay
Welcome to the Aero Family!

Designed and Maintained by
AEROSPACE ISCP Team 2019-20

Special mentions for their valuable contribution in providing information and making this handbook

Swapnil Gurav
Aerodynamics

Akanksha Ipte
Aero-Office Supporting Staff



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