

FRESHER'S HANDBOOK (2022-23)

CHEERFULLY PREPARED BY ISCP CREW



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Though the ISCP (Institute Student Companion Program) has taken care while compiling the handbook, neither the council nor the Institute can be held responsible for errors/inadequacies that may inadvertently creep in. This handbook cannot be used as a basis for making a claim on facilities/concessions/interpretation of rules/statutes or the like. If there is some critical information to which the reader of this handbook refers, it is with their responsibility that it is put to use, with cross verification if need be.

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About The Department

VISION:

To develop sustainable energy systems and solutions for the future

26 CORE FACULTY 30 ASSOCIATE FACULTY 150 PROJECT STAFFS

Department of Energy Science and Engineering (DESE) is а leading interdisciplinary energy education and research hub. DESE has developed novel education programmes focussing on the application of science and engineering to problems in energy. Recent highlights in research and development include a gridconnected MW scale solar thermal power plant and test facility, self-cleaning solar PV modules, high efficient PV cells based on new material, novel Li-ion batteries, and improved flow fields for fuel cells, and biofuel-based rural electrification.

DESE has cutting-edge fabrication, characterization, testing and demonstration, and international collaborations. We welcome you to partner with us to help design and

build a sustainable energy system for the future.



Message from Head of Department

Prof. Suneet Singh

Department Of Energy Science and Engineering EN422, Floor DESE-CSE Building, IIT Bombay Powai, Mumbai 400076 ✓ suneet.singh@iitb.ac.in
€ +91-22-2576-7843

https://www.ese.iitb.ac.in/~suneet/

Dear Students,

A warm welcome to all of you on the behalf of the Department of Energy Science and Engineering as well as on my personal behalf. I congratulate you for choosing IIT Bombay and our department for further studies. This year after a long time we are looking forward to offline classes. The last two and half years have seen lots of disruption in the educational activities and we are pleased to see a return to normal.

With ongoing paradigm shift in the energy production and usage, in my opinion it is right time to be in this department. Since, its inception in 2007 the department has been continuously gaining strength and currently we have 26 faculty, 10 staff and around 400 students who are working in various aspects of energy. The some of the areas which our department works includes solar photovoltaic, solar thermal, batteries, hydrogen storage, fuel cells, nuclear and conventional energy. We also do research in the area of grid integration, energy system modelling and policy. Apart from academics IIT Bombay and our department has several co-curricular and fun activities. We hope that you will participate and enjoy these activities as well. You are welcome to reach out to your seniors, faculty and staff of the institute and department for any support or guidance you need. I am sure that your stay at IIT Bombay will be pleasant and will lead to success in your professional and personal endeavors



Message from Faculty Advisor M.Sc-Ph.D

Prof. Sagar Mitra

Department of Energy Science and Engineering, IIT Bombay, Powai Mumbai 400 076, India Office: DESE-ESED Building (7th Floor, Room No 705)

- 🖌 sagar.mitra@iitb.ac.in
- +91-22-25767849
- http://www.ese.iitb.ac.in/faculty/sagar-mitra

On behalf of Department of Energy Science and Engineering (DESE), it is my great pleasure to welcome you all to IIT Bombay. I hope you will discover over the next few days, that you have entered a lively, challenging, diverse, and clean campus.

To you, MSc-PhD students of the 2022 Batch, welcome! I'm your Faculty Advisor from the department here to say a few words about the intellectual adventure you are about to undertake in next few years. As one of the nation's leading Institute, IITB offers many courses and programs however, your program of MSc-PhD in energy science is quite special, unique and demanding. Here, we are mixing all of your basic science knowledge blending with engineering science to make a new program of energy. Initially, you may not connect with learning experience with our curriculum however, with time you can see how easy to accommodate the new learning. I will say, please be persistent in the beginning so that you can overcome the initial huddles easily. In courses and co-curricular study, you will experience a different world of study which bring many questions and solving aptitudes.

As your advisors, you all should talk about your interests and aspirations to me in regular basis. Try new things: choose be provocative in classes that expose you to new ideas and alternative ways of thinking.

Here, I let you know that the entire department community is here to support, sustain, and encourage you as you commit to study Energy. We could not be more privileged to welcome you into this vibrant department. I write here for the entire faculty, staff, and department student community in saying we are so happy, you have made the decision to join us. Welcome again MSc-Ph.D. Batch 2022!



Message from Faculty Advisor M.Tech

Prof. Lalit Kumar

712, 7th floor, Department of Energy Science and Engineering Opposite Kendriya Vidyalaya School, IIT Bombay Powai, Mumbai, Maharashtra-400076 🔽 lalit.kumar@iitb.ac.in

🕲 ((0091 22) - 2576-7886

https://www.ese.iitb.ac.in/faculty/lalit-kumarh

I congratulate you all for choosing IIT Bombay and our department for further studies. You are welcome in the Department of Energy Science and Engineering and IIT Bombay. This year is the perfect time to join our department and Institute, as we are ready for offline classes. When you join an institute like IIT Bombay, you learn many things besides classroom stuff. It helps you in developing your overall personality. You interact and compete with different backgrounds of students, including B. Tech, PhD etc. It will give you confidence that you have equal ability as anyone else. You just need a bit of confidence and hard work to realise your potential. Energy demand is increasing and becoming critical for the country, so there won't be a better time to join us. The some of the areas in which our department works include solar photovoltaic, solar thermal, batteries, hydrogen storage, fuel cells, nuclear and conventional energy, including oil and gas. Apart from me, your faculty advisor, you are welcome to reach out to your student companions, seniors, faculty and staff of the institute and department for any support or guidance you need. I am sure your stay at IIT Bombay will be pleasant and lead to success in your professional and personal endeavours. I wish you good luck, and we will be in touch.



Message From PGAC ISAA

Mohit Meena

Institute Secretary, Academic Affairs (Masters) Post Graduation Academic Council, IIT Bombay imr@iitb.ac.in
+91 8006080474

Welcome Freshers!

We all have gone through a lot in these past couple of years, so firstly congratulations to all of you for securing admission to one of the prestigious institutes in the country. IIT Bombay provides the best exposure to its students in all aspects, both academically as well as nonacademically. The skills you develop here, and the interactions you have with people here will stay with you throughout your life. The postgraduation demands something additional compared to the graduation, more time, more effort, more determination, and a ton of dedication. For meeting these primary requirements, often we find ourselves in a daunting situation. In order to make your stay at IIT Bombay convenient, the institute has established the PGAC (Post Graduate Academic Council). Any technical necessity, any placement-related assistance, any research queries or any academic grievances, you can always reach out to us. Each department has its own AURAA (Academic Unit Representative of Academic Affairs), whom you can approach directly in case you find any difficulties. Wishing you all a really convenient and productive IIT journey! Regards,

Mohit Meena

Message from Department Coordinators

Hola, amigos

A warm welcome to the most prestigious place of learning. We invite you to the family of IIT Bombay. Congratulations on your achievement. Despite having difficulties in life's journey, you are inching closer to reaching the steady-state of life. These times are challenging due to prevailing pandemic conditions, but yes, we, the team of ISCP, are here to give you a helping hand.

Let us tell you that life at IIT Bombay might not be similar to what you have experienced till now. It will be an incredibly good experience being here, but be mindful that there can be hiccups in the initial start, but reach out to us so that you can pick up. We, the ISCP team, would like to make you comfortable during the struggling times at the institute.

Since you are all enrolled in the interdisciplinary curriculum, you will all be exposed to innovative and unique methods of learning focused on concepts as well as practical, and our campus is also distinctive and beautiful. I hope you may all discover the beauty of both learning and nature.

From the start of this adventure, you will have the opportunity to explore unknown places, discover yourself better in a new home, and think from a fresh perspective, and your emotions will be linked to this journey.

As members of the ISCP team, we hope for a smooth onboarding and subsequent transfer into the Master's programme. We wish you have the best of luck in your studies as well as adventures at IIT Bombay, and welcome to the IIT B family!



Prahlad Prajapat Department Coordinator

> Vadisela David Deenanand Raja

Department Coordinator M.Tech



Message from ISCP Team 2022-23

Dear new entrants,

Heartfelt congratulations for embarking on one of life's most memorable journeys - the journey of learning at IIT. On the behalf of our prestigious institute of IIT Bombay, team ISCP welcomes you aboard.

Give a pat on your shoulder for having achieved this feat. Your dedication, hard work and perseverance brought you here, and we know that your experience will lead you towards great opportunities. We can guarantee that your time here on this colossal campus will be exciting and knowledgeable. A degree will just be a small portion of what you will be leaving this institute with. You will also leave with beautiful memories of late-night conversations, interesting wing cultures, and crazy birthday parties (oh you are going to miss those!!). You will have the opportunity to mingle in various clubs and societies where individuals strive to become experts in their fields and devote endless hours. As a result, there will be many chances to learn inside and outside the classroom. So entering this new universe in itself presents both exhilaration and potential difficulties. This is where we will help you by providing the tips you need to handle these difficulties and enjoy your time at IIT Bombay. you there.

Now, you should be thinking what on earth is this ISCP? Institute Student Companion Programme (ISCP) is a student body with the primary objective of building a relationship of trust and comfort between the on-roll students and the incoming students of the PG programmes. We are here to help you get familiar with the ways of IITB, guide you through your ups and downs and make sure that each voice is heard. You will become part of a culture where people want to perfect their craft and thus work day in and day out. Various events are organised by the cultural, technical, and sports clubs in the institute throughout the year. Managing these along with lectures might seem daunting at first, and hence, to help you with a world of problems, including these, we assign you a student companion.



The student companions are self-motivated volunteers who will genuinely want to help you in low and high tides as an act of giving back what they received from the programme. You can rely on the team for any advice or information on anything you are venturing out into, whether it be academics or extracurriculars, any issues that you are facing, any support or requirements that you want to raise as a part of the student community. And at last but undoubtedly not least just for regular interaction because that is all the programme holds at its core. The knowledge and the experience that our student companions have gained with their stay on the campus will help your transition become smooth. From campus tours to classroom lectures, from the grading system to completing the syllabus, from the profile to placements, from Schezwan Frankie to curry-pakora, they will be there for you. We are sure that the last couple of years has been rough for many of you. But as we know that life moves on. So, make sure that you make the best out of your journey at IIT Bombay. Come and contribute to this vast store of knowledge and help it become more vibrant and colorful.

The campus of IIT Bombay awaits your presence; see you there.



Prabhat OverAll Coordinator ISCP



Dipanakar OverAll Coordinator ISCP



Abhishek Raman

OverAll Coordinator ISCP

ISCP Crew 2022-23



Prahlad Prajapat Department Coordinator (M.Sc-Ph.d) Phn no. : 8114492466



V David Deenanand Raja Department Coordinator (M.Tech) Phn no.:9133594911



Ketan Kalley Student Companion(M.Sc) Phone no. : 8010793010



Safdar Suhail Student Companion (M.Tech) Phn no. : 8545910762



Mohit Punasiya Student Companion (M.Tech) Phn no. : 8878954423



Ankur Kumar Student Companion (M.Tech) Phn no. : 9997088807



Abhijit Kumar Student Companion (M.Tech) Phn no. :7908633232



Saurabh Baghele Student Companion (M.Tech) Phn no. : 7721967920

PGAC Council

IITB Post Graduate Academic Council (PGAC) Master's Wing 2021-22

> Mohit Meena Institute Master's Representative imr@iitb.ac.in

Hazique Kola EXecutive Member 216130011@iitb.ac.in

Yash Sachin Kadam Executive Member 213079001@iitb.ac.in

Sashwat Ghai Executive Member 21335t005@iitb.ac.in Damini Kale Executive Member kaledamini_19@ymail.com

Bhavana Chekkala Design Nominee 213420004@iitb.ac.in Kanhaiya Kumar Web Nomine kanhaiyakumarmit16@gmail.com

Sravani Bontha Academic Unit Representative for Academic Affairs (AURAA) Dept. of Energy Science and Engineering (MSc Ph.D.) 21i170020@iitb.ac.in

Faculty



Prof. Anish Modi



Prof. Ashish Kumar Sarangi



Prof. Balasubramaniam Kavaipatti



Prof. Chetan Singh Solanki



Prof. Dayadeep Monder

Research area: Solar thermal energy, Concentrating solar power, Power cycles, and poly generation plants, Energy sustainability Contact: anishmodi@iitb.ac.in https://www.ese.iitb.ac.in/faculty/anish-modi

Research area: IC Engines and Combustion, Advanced Low- Temperature Combustion, Optical Diagnostics, Exhaust After-treatment, Alternative Fuels in IC Engines, Engine Performance, and Emissions Contact: asish.sarangi@iitb.ac.in https://www.ese.iitb.ac.in/faculty/asish-sarangi

Research area: Cheap and abundant materials for Photovoltaic applications, Bandgap engineering of materials for photoelectrochemical energy conversion, solid oxide fuel cell cathode materials to study surface processes Contact: bala.ramanathan@iitb.ac.in (+91-22-2576-7808) https://www.ese.iitb.ac.in/faculty/balasubramaniam-kavaipatti

Research area: Solar Photovoltaic, Thin-film silicon solar cells, PV solar concentrator, PV module cleaning, Carbon nanotubes (CNT) Contact: chetanss@iitb.ac.in (+91-22-2576 4890) https://www.ese.iitb.ac.in/faculty/chetan-singh-solanki

Research area: Solid oxide fuel cell (SOFC) modeling at the electrode and cell levels, Flow battery modeling, First-principles catalysis and ab-initio thermodynamics, Materials for photoelectrochemistry Contact : dmonder@iitb.ac.in (+91 22-2576-7864) https://www.ese.iitb.ac.in/faculty/dayadeep-monder



Prof. Guru Balan Annadurai



Prof. Manoj Neergat



Prof. Karthik Sasihithlu



Prof. Lalit kumar



Prof. Manaswita Bose



Prof. Pavan kumar hari

Research area: Heating, Ventilation, and Air conditioning Systems, Energy recovery exchangers, Desiccant Humidity Control, Heat, and Mass Transfer

Contact : guru.a@iitb.ac.in

https://www.ese.iitb.ac.in/faculty/gurubalan-annadurai

Research area: Fuel cells - Direct Methanol Fuel Cells, and Polymer Electrolyte Membrane Fuel Cells, Flow Batteries, Precious Metal, and Non-precious Metal Catalysts, Electrochemistry of Layered Materials, Electrodeposition (Cu and CZTS), Conducting Polymer Electrolyte Membranes, Supercapacitors Contact: nmanoj@iitb.ac.in (+91 22) - 2576-7893) https://www.ese.iitb.ac.in/faculty/manoj-neergat

Research area: Light-matter interaction, metamaterials, hyperbolic materials, Thin film solar photovoltaics, Heat Transfer Physics, Thermal boundary resistance Contact: ksasihithlu@ese.iitb.ac.in (+91-22-2576-9347) https://www.ese.iitb.ac.in/faculty/karthik-sasihithlu

Research area: Wax deposition, pipeline shut-in, and restart processes, Thermal management of living space, battery, exhaust after-treatment, etc, Water Purification/Oil-water separation, Population balance modeling Contact: lalit.kumar@iitb.ac.in (+91 22)- 2576-7886) https://www.ese.iitb.ac.in/faculty/lalit-kumar

Research area: Flow of Granular Materials, Complex Fluid Dynamics & Multiphase Flows, Molecular Dynamic Simulation of Particulate Flows, Coal Gasification and Combustion Contact:manaswita.bose@iitb.ac.in (+91-22-2576-7847) https://www.ese.iitb.ac.in/faculty/manaswita-bos

Research area: Control and Pulse Width Modulation (PWM) methods for Power Electronic Converters, Wind Energy Conversion, Electric Vehicles, Application of Wide Band-Gap Semiconductor Devices in Power Electronic Systems Contact: pavanhari@iitb.ac.in (+91 22 2576 7853) https://www.ese.iitb.ac.in/faculty/pavan-hari



Prof. Pratibha Sharma



Prof. Prakash Chandra Ghosh



Prof. Venkatasailanathan Ramadesigan



Prof. Rajesh Gupta



Prof. Sandeep Kumar



Prof. Rangan Banerjee

Research area: Solid State Hydrogen Storage Materials, Hydrogen Storage Systems, Materials for Photovoltaic Applications Contact: pratibha_sharma@iitb.ac.in (+91 22) - 2576-7898) https://www.ese.iitb.ac.in/faculty/pratibha-sharma

Research area: Hydrogen production from renewable sources, Development of low-temperature hybrid fuel cells, Optimum design of fuel cells systems, Development of non-destructive methodologies for testing fuel cells, Development of membranebased humidifier to design compact fuel cells, Development of HT-PEFC

Contact: pcghosh@iitb.ac.in (+91 22)- 2576-7896) https://www.ese.iitb.ac.in/faculty/prakash-chandra-ghosh

Research area: Modelling & numerical simulation of electrochemical energy storage systems, Model-based design and optimization of Li-ion batteries and other metal-ion batteries, Solar-PV- battery integrated performance models, Fuel Cells, Redox Flow Batteries, Advanced Battery Management Systems Contact:venkatr@iitb.ac.in (+91-22-2576-7875) https://www.ese.iitb.ac.in/faculty/venkat-ramadesigan

Research area: Characterization, modeling and simulation of solar cells and modules, Performance and Reliability of Photovoltaic, Photovoltaic Instrumentation, Infrared Thermography Contact rajeshgupta@iitb.ac.in (+91-22-25767837) https://www.ese.iitb.ac.in/faculty/rajesh-gupta

Research area: Biomass Gasification, Solid Combustion, Alternate fuels in IC Engines, Solid Waste Management , Renewable Energy Systems Contact: sandeep.kumar@iitb.ac.in(+91 22 2576 9346) https://www.ese.iitb.ac.in/faculty/sandeep-kumar

Research area: Energy Management & Energy Efficiency, Demand Side Management, Energy Modelling, Power Systems Planning, Energy Planning and Policy , Cogeneration, Fuel cell / Hydrogen storage Contact: rangan@iitb.ac.in (+91-22-2576 7883) https://www.ese.iitb.ac.in/faculty/rangan-banerjee



Prof. Sagar Mitra



Prof. Sankara Sarma V Tatiparti



Prof. Shireesh B Kedare



Prof. Santanu Bandyopadhyay



Prof. Shaibal Sarkar



Prof. Srinivas Seethamraju

Research area: Lithium-ion Battery, electrode materials, electrolyte, fabrication, Na-ion batteries, electrode materials, fabrication, Metal Sulphur Batteries for large-scale storage, Hybrid Ionic electrolyte, Commercial-scale battery research, Lithium-ion battery analysis Contact:sagar.mitra@iitb.ac.in(+91-22-25767849) https://www.ese.iitb.ac.in/faculty/sagar-mitra

Research area: Hydrogen storage, Supercapacitors, Electro fabrication of nanostructured materials, Electron Microscopy, Polycrystalline nano dendritic growth, Scanning Electro-Chemical Microscopy (SECM) Contact: sankara@iitb.ac.in ((+91 22) – 2576 7672)

https://www.ese.iitb.ac.in/faculty/sankara-sarma-v-tatiparti

Research area: Concentrating Solar Collectors for process heat and power with thermal storage, Renewable energy technologies, Indian oil and natural gas sector, Context-specific participatory integrated rural development

Contact: sbkedare@iitb.ac.in (+91 22 2576 7835) https://www.ese.iitb.ac.in/faculty/shireesh-b-kedare

Research area: Process Integration, Pinch Analysis, Industrial Energy Conservation, Modeling and Simulation of Energy Systems, Energy Integration of Distillation Processes, Renewable Energy Systems Contact: santanub@iitb.ac.in ((+91 22) - 2576 7894) https://www.ese.iitb.ac.in/faculty/santanu-bandyopadhyay

Research area: Perovskite Solar Cells, Transparent Conducting Oxides, Atomic Layer Deposition Contact: shaibal.sarkar@iitb.ac.in (+91 22 2576 7846) https://www.ese.iitb.ac.in/faculty/shaibal-k-sarkar

Research area: Conceptual Design of Processes and Process Simulation, Fischer-Tropsch Synthesis, Reactive distillation, Gasification, Integration of renewable energy (biomass) and fossil energy resources, Waste to Energy

Contact : s.srinivas@iitb.ac.in (+91 22-2576-7396) https://www.ese.iitb.ac.in/faculty/srinivas-seethamraju



Prof. Suneet Singh



Prof. Suryanarayana Doolla



Prof. Zakir Hussain Rather

Research area: Advanced Numerical Methods for neutron diffusion and fluid flow, Stability Analysis of Nuclear Reactors, Solar thermal, Analytical solution of multilayer heat conduction problems Contact: suneet.singh@iitb.ac.in (+91-22-2576-7843) https://www.ese.iitb.ac.in/faculty/suneet-singh

Research area: Smartgrids, Microgrids, Converter topologies and control, a Communication protocol for power systems, Grid integration of distributed energy resources, Power systems operation and control, Energy efficiency Contact: suryad@iitb.ac.in (+91 22- 2576- 7872) https://www.ese.iitb.ac.in/faculty/suryanarayana-doolla

Research area: Grid Integration of Renewables (Wind and Solar PV power plants) , System Integration of Renewables, Power system dynamics and control, Electric vehicle grid integration, Wide Area Measurement Systems (WAMS), Wide Area Monitoring Control and Protection (WAMPAC), Smart Grid and microgrid, and Demand Side Response/Management.

Contact: zakir.rather@iitb.ac.in (+91 22-2576-9341) https://www.ese.iitb.ac.in/faculty/zakir-rather



Know your Seniors- M.tech



Safdar Suhail

Project title/area: Effects of variable swirl on lowtemperature combustion in a compression ignition engine Hobbies: Swimming, cycling Phn no. : +918545910762

Bibhutinand Jha Project title/area: De-carbonisation of Cement Industries in Nepal

Hobbies: Playing Basketball, Travelling, Watching TV series Phn no.: 9142521636





Nima Zangmo

Project title/area: Holistic Approach towards waste Management System in Bhutan Hobbies: Reading, Hiking and Traveling to new places Phn no. : 8976502775

Nevil Antony Project title/area: Power Quality in High-Speed Traction Power Supply System Hobbies: Playing Badminton, Football, Cricket. Phn no.: 9496950667





Mohit Punasiya

Project title/area: Machine Learning-based model for prediction of combustion characteristics in RCCI Engine Hobbies: Swimming, Running, Exploring Phn no. : 8878954423

Abhijit Kumar Project title/area: Machine Learning Optimization of Metal Hydride Bed Design Hobbies: Poetry, Reading Novels, Travelling Phn no. : 7908633232



Lt Cdr Hemant Rathore Project: Besafe technology Hobbies: Reading , Music , Badminton Phn no. : 8888937186





Ankur Kumar Project: Solar Receiver for Bakery Hobbies: Cricket, Kabaddi, Watching web series Phn no.:9997088807

Saurabh Baghele Project title/area: Bifurcation Analysis of Two-Phase Natural Circulation Loop Hobbies: Playing & watching cricket, Phn no.: 7721967920





Soumya Sharma

Project title/area: Solar resource forecasting using ML Hobbies: Singing, painting, acting Phn no.: 7692805642

Praveen Jha Project title/area: Thermal management of batteries for Electric Vehicles Hobbies: Logical Debate, Cricket Phn no. : 07039487787





Alok Katiyar Project title/area: Vertical axis wind turbine near highways Hobbies: Cricket, music, movies Phn no.: 8810668089

Sanjay Singh Project title/area: Solar thermal energy storage Hobbies: Trekking, camping, and football Phn no. : 9568121276





Amit Vivek Joshi Project: Prediction of wind potential in the future due to climate change Hobbies: Singing, Chess, Cricket Phn no. : +919325266745

Shubham Singh Rao Project title/area: Grid Integration of electric vehicles Hobbies: Car driving, reading about the defense forces of India Phn no.: 9784920262



V David Deenanand Raja Project: Control of static power conditioners in railway power supply Hobbies: Table tennis, badminton, Playing piano. Phn no.: 9133594911





Rushil Ambarish Kadu Project: Battery Thermal Management Hobbies: Trekking, travel & movies Phn no. : 8779558381

Ketan Abhay Gandhi Project: Hydrogen Permeation in PEM Electrolyzer Hobbies: Singing, Cooking Phn no.: 9172263866





G R Uday Kumar Reddy Project: Direct Torque control of induction machines Hobbies: Playing cricket Phn no. : 7995338522

Manish kumar Project: Carbon constrained power system planning Hobbies: Sports Phn no. : 8450009037





Lt Cdr Piyush Sagar Project: Waste to Energy Hobbies: Swimming, Reading, Living life one day at a time Phn no. : 7350401788

Jitesh Ramrao Mane Project: Design different converters for different micro energy harvesting applications Hobbies: Cooking, traveling, playing with pets Phn no.: 9071401992



Know your Seniors-(M.Sc-Ph.D)



Harshvardhan Arya

Project: Hydrogen sorption in active-network assisted Mg Hobbies: Reading, Dancing, gaming, and listening to music Phone no.: 8755326224

Amrapali G. Patil Project: Synthesis of Chalcogenide Light Absorbers Hobbies: Visiting historical places, Dancing, Reading. Phone no. : 7350636514





Ashish Kr. Tiwari Project: Design of equivalent electrical circuits through EIS for supercapacitor applications. Hobbies: Playing Cricket & Badminton, Watching F1, Poetry Writing, Memes & Overthinking. Phone no.:9928791752

Bilash Thakur Project: Nodal Integral Method Hobbies: Travelling Phn no. : 7890755060





Govind Pattila Project:: Energy-Climate Nexus Hobbies: Travel, Music, and Books Phone no. : 9400769899

Ketan Kalley Project: Solar-assisted heat pump dryer Hobbies: Make 2d animation, Corel designing Phone no.: 8010793010





Abhik Manna Project: Redox flow batteries Hobbies: Thinking Phone no. : 7001343304

Siddharth Kumar Project:: Rayleigh Bernard flows Hobbies: Playing Guitar, Video editing Phone no.: 8368329487





Deeksha Dwivedi Project: Lithium-sulfur battery Hobbies: Sleeping Phone no. : 9654947492

Jayant Dwivedi Project: Redox flow battery Hobbies: Travelling Phone no.: 7599771555





Avinash Ajmera Project: carbon capture and utilization Hobbies: Traveling, Book reading, Sports Phone no.: 9667801968

Dhanavath Devilal Project: Chemical Hydrides Hobbies: Practicing Indian classical music!! Phone no. 6303698738





Souvik Dasgupta Project: Phase change materials for thermal energy storage Hobbies: Gaming, coding, tinkering Phone no.: 9711276128

Rajendra Kumar

Project: Cobalt-Free Cathode for high Energy Lithium-ion Battery in Electric vehicles Hobbies: Listening to classical music, Walking in historical places Fruitless service & badminton Phone no.: 6395167194





Prahlad Prajapat Project: P-type Transparent Conductor Hobbies: Playing Chess, Cycling, yoga, and writing Phone no.: 8114492466

Sravani Bontha Project: Solid State Hydrogen Storage Design Hobbies: Travelling and Hanging out with friends Phone no. : 9381185365

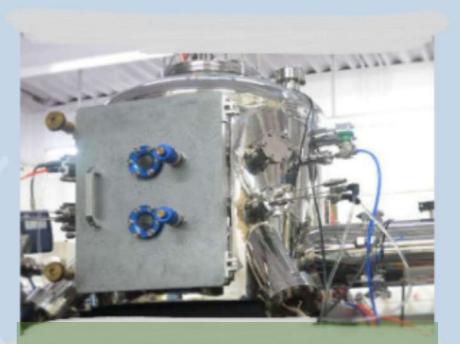




Research Facilities



Fuel Cell Test Station



Thermal Evaporator



Advanced Electrochemical System



Fourier Transform Infrared Spectrometer



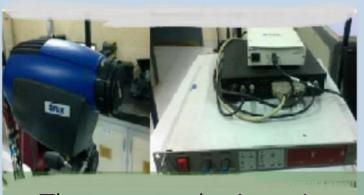
Spray Pyrolysis



X-Ray Diffractometer



Thermogravimetric Analyser coupled with Quadrupole Mass Spectrometer



Thermography Imaging System





MCR - Modular Compact Rheometer



Atomic Layer Deposition



Field Emission Electronic Microscope

Electro/Photo-Luminescence Imaging System

To know more about the research facilities please visit: ese.iitb.ac.in/research/facilities



Metal Sputtering Unit

Department Activities

Energy Day 2022

Energy Day is an annual exhibition held at the Department of Energy Science and Engineering, IIT Bombay. The day-long event features technical presentations and interactive posters on a wide variety of topics like Electric Vehicles, Solar Thermal Technologies, Battery and Storage, Power converters and Transformers and many more by graduating students of Dual Degree, M.Tech and Ph.D.programs. The main focus is the display of the ongoing research in the department to peers and industries. The Energy Day was conducted offline



International Conference on Advances in Energy Research

ICAER i.e. International Conference on Advances in Energy Research is an international conference organized every alternate year at the Department of Energy Science and Engineering, IIT Bombay. The conference provides an excellent platform to know, exchange new ideas, and understand the challenges related to the energy sector at large. The latest edition of the ICAER was the 7 th conference and was held from 10 th - 12 th of December 2019. The next conference will be held in 2022 from July 7th to 9th. The conference works as a much-needed bridge between the industry and academics allowing the effective exchange of ideas and information.

Core talks

Core talks were conducted on 25th September 2021. Lokesh Jain (MTech 2006) was invited to share his invaluable experience after graduating. The speaker covered topics related to the presence of core energy in the job industry and its scope of it. The event saw an attendance of 100+ participants

Department Trip

The department trip was conducted on 26-27th March 2022. It was a 2-day trip, where the 1st day was spent in Sandhan Valley followed by night camping and the 2 days was the Kalsubai trek. Department Trip details: This is not an exhaustive list, many other activities have been conducted like Orientations, Research talks, and Valedictory. So stay tuned



Kurta day

Department Kurta Day was conducted on 6th April 2022. Since it was the first offline event after a lot of time, and it was also the last kurta day for the graduating seniors, the event attendance was great



Sports Activities

Due to the pandemic, the activities paused, and then the PGAC cricket tournament was conducted in which we were runner-up. Apart from that many other activities were conducted as a part of Aavhan 2022. There were also Intra department tournaments conducted. So get ready, be steady.



Runner Up Team in PGAC Cricket tournment

EnSider

ENsider is the department's official online newsletter. DESE launched its online newsletter "ENsider" on May 4, 2020. The event was held via online video conference and the director of IITB Prof Subhasis Chaudhuri released the online version. Four issues of Ensider have so far been released. The newsletter includes interviews, insights, and many more related to the energy sector

The newsletter may be accessed from this link: https://www.ese.iitb.ac.in/ensider/



Department Bulletin

Professor Rangan Banerjee appointed as the Director of IIT Delhi



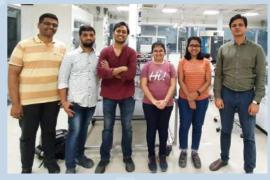
Prof Rangan Banerjee has been appointed as Director of IIT Delhi. He took charge on Feb 15, 2022. He has been working as a faculty with our department for the last 30 years. He has done his B.Tech in Mechanical Engineering (1986) and Ph.D. (1991) from IIT Bombay. He joined as an assistant professor in Energy Systems Engineering in 1993, an interdisciplinary program that he would help turn into the Department of Energy Science and Engineering (DESE) in 2007.

His areas of interest include energy management, energy systems modeling, energy planning and policy, hydrogen energy, and fuel cells.

He has made a significant contribution to the growth of the department. Prof Banerjee has also held notable administrative roles. He was the Associate Dean (R&D) from 2003 to 2006 and Dean (R&D) of IIT Bombay from 2009 to 2012. He has served as the head of DESE for a cumulative of 8 years in the past 15 years.

IIT Bombay Team won X-PRIZE

Team 'SASIITB' has won the X-PRIZE award (of USD 250,000) for carbon removal supported by the Elon Musk Foundation, for 'Demonstration of Carbon Dioxide Removal'. SASIITB is the only single-institution team to win from India, among 23 winning teams from ten countries, out of 195 applicants globally.





Editorial Appointment

Professor Suryanarayana Doolla has been appointed as guest editor at IEEE (Institute of Electrical and Electronics Engineers) on the topic of machine learning applications in power electronics. He is also the editor of the IEEE Journal of emerging and special topics in power electronics (2020-present).

Awards

- Professor Suryanarayana Doolla was awarded institute-level S. P. Sukhatme Excellence in Teaching Award in the year 2021
- Professor Santanu Bandyopadhyay was awarded Departmental awards for Excellence in Teaching in the year 2021



Cultural Clubs

IITB Culturals – https://linktr.ee/culturals_iitb

Institute cultural council – https://cultural-iitb.org/



Style – The Fashion Club of IIT Bombay

https://instagram.com/styleup_iitb? igshid=YmMyMTA2M2Y=

Comedy Cons – The Stand-Up Comedy Club https://instagram.com/comedycons_iitb? igshid=YmMyMTA2M2Y=

We Speak – The English Speaking Arts Club

https://instagram.com/wespeakiitb? igshid=YmMyMTA2M2Y= mbay -

Literati – The Official Literary Arts and Quiz Club https://instagram.com/wespeakiitb? igshid=YmMyMTA2M2Y=

SilverScreen – The Official Film & Media club

https://instagram.com/silverscreen_iitb? igshid=YmMyMTA2M2Y=

Symphony – The Official Music club

https://instagram.com/symphonyiitb? igshid=YmMyMTA2M2Y=

Roots - Institute Classical and Folk Arts Club

https://instagram.com/roots_iitb? igshid=YmMyMTA2M2Y=

InSync – The Dance Club

https://instagram.com/insync_iitb? igshid=YmMyMTA2M2Y=

Pixels – The Photography Club https://instagram.com/pixels_iitb? igshid=YmMyMTA2M2

Fourthwall -The Dramatics Club

https://instagram.com/fourthwall_iitbombay? igshid=YmMyMTA2M2Y=

Rang – The FineArts Club

https://instagram.com/rang_iitb? igshid=YmMyMTA2M2Y=

Design – The Design Club

https://instagram.com/designiitb? igshid=YmMyMTA2M2Y=

Vaani – The Indian languages Club

https://instagram.com/vaani_iitb? igshid=YmMyMTA2M2Y=

PG Culturals

https://instagram.com/pgcult_iitb? igshid=YmMyMTA2M2Y=



Sport Clubs

Institute Sports

https://instagram.com/iitbombaysports? igshid=YmMyMTA2M2Y=

PG Sports

https://instagram.com/iitbpgsports? igshid=YmMyMTA2M2Y=



Chess Club https://instagram.com/dkcc_iitb?igshid=YmMyMTA2M2Y=

Tennis Club https://instagram.com/tennis_club_iitbigshid=YmMyMTA2M2Y=

Yogastha https://www.instagram.com/yogasthaiitb/?hl=en

Fitness Club https://instagram.com/fitness_club_iitbigshid=YmMyMTA2M2Y=

Aquatics Club https://instagram.com/adventureclub_iitbigshid=YmMyMTA2M2Y=

Weight lifting Club https://instagram.com/iitb_weightlifting?igshid=YmMyMTA2M2Y=

Volleyball Club https://instagram.com/volleyballclub_iitbombayigshid=YmMyMTA2M2Y=

Hockey Club https://instagram.com/iitbombay_hockey?igshid=YmMyMTA2M2Y= Table Tennis Club https://instagram.com/dkcc_iitb?igshid=YmMyMTA2M2Y=

Tennis Club https://instagram.com/table_tennis.iitb?igshid=YmMyMTA2M2Y=

Frisbee Club https://instagram.com/iitb_ultimate_frisbeeigshid=YmMyMTA2M2Y=

Athletics Club https://instagram.com/iitbombayathletics?igshid=YmMyMTA2M2Y=

Cricket Club https://instagram.com/cricket_club_iitb?igshid=YmMyMTA2M2Y=

Football Club https://instagram.com/iitb_football?igshid=YmMyMTA2M2Y=

Basketball Club https://instagram.com/basketball_iitb?igshid=YmMyMTA2M2Y=

Tech Clubs && Teams

Sustainability Cell

Sustainability Cell is a newly formed body to address sustainability in our campus. The aim is to encourage discussion and debate, involve student and faculty communities, foster innovative projects, and work towards not only making our campus sustainable but also spreading the same principles in our society.



Team Shunya



Team Shunya is an amalgamation of various departments of IIT Bombay, which works on sustainable building projects. This team represents India in the prestigious competition, Solar Decathlon, often referred to as the 'Olympics of Sustainable Architecture' which is organized by the US Department of Energy. In the most recent achievements, team has got the second position in the US Department of Energy Solar Decathlon for the attached housing division.

Website: https://www.teamshunya.com/index.html

Energy Club

Energy club is a group of energy-conscious students under the backing of faculties aiming to spread energy awareness on campus. The club frequently conducts events and do provide some fundamentals courses related to energy. The club launch a bi-annual newsletter every year called Joules. Weblink: https://iitbenergyclub.github.io/

More technical clubs:

- Chemistry Club
- Student Reading Group
- Web and Coding Club
- Tinkerer's Lab
- Aeromodelling Club
- Electronics and Robotics Club
- KRITIKA— the Astronomy Club
- Maths and Physics Club

More Tech Teams:

- Mars Rover Team
- IIT Bombay Racing
- Innovation Cell IIT Bombay
- Pratham
- AUV-IITB

Grading System

For every course taken by a student, he/she is assigned a grade based on his/her performance over the semester in all the assessments in that course. These grades are described by the letters AP, AA, AB, BB, BC, CC, CD, DD, FF, FR, and DX, each of which not only indicates a qualitative assessment of the student's performance but also carries a quantitative (numeric) equivalent called the grade point as given below.

Letter Grade	Points
AP	10
AA	10
AB	9
BB	8
BC	7
CC	6
CD	5
DD	4 (Min. passing grade)
FF	0 Fail (Eligible for one re-exam)
FR	0 Fail (Repeat the course)
DX	Fail (Lack of attendence - Repeat the course)
II	Incomplete (On health grounds)
DR	Dropped
W	Withdrawn
PP	Passed
NP	Not passed
AU	Audit

For more details:

http://www.iitb.ac.in/newacadhome/M.Sc.rulefinal201815June.pdf

Important Information

LDAP ID

It is the unique identification of each individual in IIT Bombay. By default, the LDAP ID assigned to you is the Roll Number of the student. It can be changed by the student but only once in a lifetime. Though it is preferable not to change your LDAP ID as you will be able to remember your Roll Number easily.

Webmail

This is your personalized e-mail in IIT B. You will get your Id when you get enrolled in IITB. Along with normal mails, here you also get alerts for registration/ de-registration of courses, fees payment, and any broadcast on Moodle among others. We can change the username and password of the webmail for giving it a personal look in order to make conversations with abroad professors or other personal work. You have to regularly check (5-6 times a day) GPO to get updated.

The webmail id is always LDAP_ID@iitb.ac.in for any student. Link: https://webmail.iitb.ac.in

Moodle - Academic

It is the website that provides for academic interactions between faculty and students in IIT Bombay for all courses enrolled by a student. From Moodle, you can download all the course materials uploaded by the Course Instructor for the course you have registered for and also interact with the faculty and it is a forum for academic discussions. This one website will be used by you very frequently and it is an interactive platform with TAs and Professors on any subject-related matter Link: https://moodle.iitb.ac.in/.

CAMP

The following things will be available in CAMP Website Changing Password Changing UserID (Only Once) Modifying Personal Details Set / Reset mail Auto Reply Text Set / Reset mail Forwarding Address Department Sys-Ads List Hostel Sys-Ads List Find your UserID from Roll number / Employee Number Link: https://www.cc.iitb.ac.in/camp/

Application Software Centre (ASC) – Administration

This website is the main interactive website for a student for all of his/her administrative requirements. From paying your fees to checking your grades all can be done on this website. This website also has links to all the other websites of the institute. Some of the most important facilities provided by this website are given: 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) Link: https://asc.iitb.ac.in/

External Portal

This website will have your details. It is similar to ASC and can be accessed from anywhere around the world. link: https://portal.iitb.ac.in/asc/Login

Important Online Meet Platforms that will be used

It is advisable to sign in to the following websites using your webmail IDs.

Google meet: https://meet.google.com/ Cisco WebEx: https://www.webex.com/ Zoom: https://zoom.us/meetings

Some Useful apps

InstiApp Download Link: https://play.google.com/store/apps/details?id=app.insti&hl=en_IN

m-Indicator Download Link: https://play.google.com/store/apps/detailsid=com.mobond.mindicator

Links for other Miscellaneous purposes

1. Accessing IITB Internal Sites with VPN: https://www.cc.iitb.ac.in/page/services-vpnssh 2. Configuring IITB-Wireless in laptop/android/desktop: https://www.cc.iitb.ac.in/page/configurewireless 3. Access GPO mail on mobile mail: http://homepages.iitb.ac.in/~yatindestel/docs/GPO%20in%20Gmail.pdf 4. Free Licensed Software https://www.cc.iitb.ac.in/page/services-software 5. How to forward GPO mail to Gmail http://camp.iitb.ac.in/cgi-bin/index.cgi 6. Rules and Regulations for M.Tech. http://www.iitb.ac.in/newacadhome/rulesPG.jsp 7. Link for External ASC site https://portal.iitb.ac.in/asc/Login 8. Link for Central Library https://www.library.iitb.ac.in/ 9. Link for Internship and Placement portal: https://campus.placements.iitb.ac.in/ 10. Link for academic calendar http://www.iitb.ac.in/newacadhome/toacadcalender.jsp 11. Link for academic timetable http://www.iitb.ac.in/newacadhome/timetable.jsp 12. Link for IITB Holiday List http://www.iitb.ac.in/en/about-iit-bombay/iitbombay-holidays-list 13. Link for circulars http://www.iitb.ac.in/newacadhome/circular.jsp

Placement Details



Gender Cell

IIT Bombay has worked to create a safe and comfortable environment for the nearly 2000 women students on campus. IIT Bombay's Women's Cell has been in existence since 2002. With the enactment of the Institute's policy on sexual harassment, the Cell has been renamed the Gender Cell (GC). The IIT Bombay Gender Cell (GC) inquires into complaints of sexual harassment through its Internal Complaints Committee (ICC). The Gender Cell of the Institute has several programs to promote gender sensitivity.

In recognition of the Institute's belief that its employees and students have a right to be treated with dignity and respect, the Cell works proactively towards developing a safe and secure environment for employees, and to ensure that all students may gain their education without fear of prejudice, gender bias, hostility or sexual harassment.

For more information, please visit our website: http://www.gendercell.iitb.ac.in/

Female QRT (Quick Response Team) in-charge: 9167398598

Office Address: 3rd Floor, Main Building, Next to Student Wellness Center, IIT Bombay, Powai, Mumbai - 400076. Extn: 5052.

Email Address: gendercell@iitb.ac.in





Student Wellness Center

While starting your new life at IIT Bombay, you may experience a sudden change in your surroundings. Your responsibilities will increase at the hostel and the academic level. Also, the current coronavirus pandemic situation and online classes have affected us in several ways. Take heart, you are not the only one. Almost everyone in the institute initially faces issues like academic concerns, social (family and peer) pressure, etc, leading to feelings of loneliness, low confidence, anxiety, stress, anger, and sadness, to name a few.

To help you refrain from losing focus and being unhappy, we as Counsellors encourage you to approach us for any problem you face- academic, emotional, social, or financial- without hesitation.

Services:

- 1. Individual counseling
- 2. Psychological assessment
- 3. Workshops and events

For 1st Counselling Appointment: Go to site Menu -> Appointment: https://www.iitb.ac.in/swc/en/appointment

If the link is not working then you can email us at wellnes@iitb.ac.in

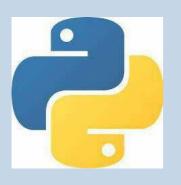


"Some bridges are made to cross your sadness"



Beyond the class room

PYCK



Python is Cool Kids (PyCK) is a free course designed for those who already know the basics concepts of programming (C/C++/Java/Any other language). Python is an Interpreted, Object-Oriented, High-Level General-Purpose programming language that will help you in many aspects of your studies. It is often compared (favorably of course :-)) to Lisp, Tcl, Perl, Ruby, C#, Visual Basic, Visual Fox Pro, Scheme, or Java... and it's much more fun. It has a very wide variety of applications including web and internet development, scientific and numeric, software development, business applications, and many more.

This is a 5-week course with 3 days of lectures and tutorials distributed throughout the week and one final interesting project. In this course, you will learn how to use python, get familiarised with popular python libraries, and build cool stuff fast and easy!!

Leaners' Space

Learners' Space is a platform that will help you to get a basic understanding of various topics, be it technical or non-technical, through online summer courses. It is a platform where you can take any course of your interest and get certified in it, the only prerequisite being your enthusiasm.

We have both Non-Technical Summer School or NTSS, giving you the opportunity to explore various sectors such as Finance, Consultancy, Analytics, Entrepreneurship, etc. as well as Technical Summer School or TSS, providing courses on Python, Web and Game Development, LaTeX, etc.

Taking into account the current scenario and keeping in mind the short summer break, we plan to introduce a hybrid (material + webinars) model along with some new collaborations and fun learning.

Maths and Physics Club



Maths and Physics Club has taken the initiative of Summer of Science to inspire, encourage, and help find the joy of learning. In this program, the mentee will find a mentor with sufficient knowledge on the topic to guide the search for the entire duration of summer, i.e., it starts from May's first week till July's second week. It is not needed to be present in the institute throughout the entire period of SoS the communication with the mentors will be through online mode, and at the end of the duration of SOS, a report has to be submitted for completion of the project. With equal standing as that of ITSP, the SOS certificate will be given on submission of the report.

ELIT

ELIT (English Language Improvement Training) is a student-driven English support and training program, with a dynamic, activity-centric curriculum. This is open to all students of the institute and is run by a group of Teaching Assistants. These classes improve language fluency and improve your soft skills.

An ELIT TA typically works with the rest of the team to:

- Discuss, ideate, and create an English language curriculum for the edition.

- Design activities to help students understand and practice spoken English, grammar, and writing.

- Take classes once or twice every week through live sessions.

The aim of this program is to increase confidence in conversations and presentations, to make better sentence formation, and to tackle complicated parts of the language, to help in developing the required skill set to produce a comprehensive written piece.



Department Staff

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Sharmila Maurya Junior Administrative Assistanr Sharmila_m@iitb.ac.in Leena S Mungekar Administrative Assistant leenam@iitb.ac.in

Suraj Singh Technical Superintendent shsingh@iitb.ac.in

Rimpa Sur Administrative Assistant rimpa.sur@iitb.ac.in

Emergency Contact

Quick Response team 9167398598/ 9833337979/ 9833338989 Security section IITB 022-2576(1100)/ 9165398596

Ambulance IITB 022-2576(1110)

IITB Hospital 022-2576(1110/ 7051) Police station Powai 022-25702690

Seven Hills Hospital 022-67676767/ 6766

Hiranandani Hospital 022-25763333

Fire Station- Marol 022-29200940 Fire Station- Vikhroli 022-25170730

Fire control room 022-23076111



WE WELCOME YOU ABOARD !