Department Handbook

Electrical Engineering

2019-2020

IIT BOMBAY

DISCLAIMER

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Contents

1. About The Department

The Department of Electrical Engineering (EE) is one of the largest departments of IIT Bombay since its inception in 1958. The department has different academic programs with about 570 undergraduate and 730 postgraduate students. The department is equipped with the state of the art experimental and computational facilities for undertaking R & D and consultancy activities in various fields.

The EE department has a vibrant postgraduate program with strong focus on research and development. The number of postgraduate students in EE is more than that of the undergraduate students and the department attaches a lot of importance to its Masters' students as they constitute the backbone of research and development.

The department offers M.Tech in six research areas / specializations:

- Communications Engineering (EE1)
- Control and Computing (EE2)
- Power Electronics and Power Systems (EE3)
- Electronic Systems (EE5)
- Integrated Circuit and Systems (EE6)
- Solid State Devices (EE7)

Faculty members of the department are recipients of many distinguished awards like Shanti Swarup Bhatnagar Prize, Prof. K. Sreenivasan Memorial Award, Prof. SVC Aiya Memorial Award, Dr. Vikram Sarabhai Research Award, Ram Lal Wadhwa Award, INAE Young Engineer Award, Alexander von Humboldt Fellowship and many others.

Many faculty members are Editors of IEEE and other national and international journals. They are also Fellows of organizations like IEEE, IETE, INAE, IASc, NASI and INSA.

2. Message from H.O.D

Congratulations on your selection for the M.Tech/Ph.D. program in EE at IIT Bombay. As you know, the competition was very stiff and you are among the very few students who made it. We, the faculty members, staff and students extend a warm welcome to you.

As you are aware, ours is among the largest Electrical Engineering departments in the country with 64 faculty members and 1360 students, of which more than 55% are graduate student. We have a strong academic and research culture. We have state-of-the-art research laboratories in almost all areas of electrical engineering and a few centres of excellence. I am sure you will find this place academically rewarding.

Your department has a lot to give –just how much you take depends on one person-and that is you. You will face diverse temptations but you need to stay focused to achieve your goals. Do good work-you grow, and the department does too. It is a win-win situation. All in all, I assure you the time spent here will be the best years of your life!

Feel free to contact me if you need any help!

Baylon G Fernandes
Head Of Department
bgf@ee.iitb.ac.in

3. 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 Institute Students Companion Program (ISCP) 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.

What to expect from a Student Companion:

- Initial information about the campus, courses, academics and extracurricular activities.
- Support in case of any problem or difficulty.
- Organization of various academic and non-academic activities for student's development.
- Continuous interaction and feedback from students on their needs and requirements.

In short, this is a program by the PG students of IIT Bombay for the new entrants to ensure their easy adaptation to IIT Bombay culture and assist them in an overall development through utilization of all the available resources at IIT Bombay. Let the learning begin. Feel free to contact us anytime!

Mail to: iscp@iitb.ac.in
Overall Coordinators
Institute Student Companion Programme (2019-20)

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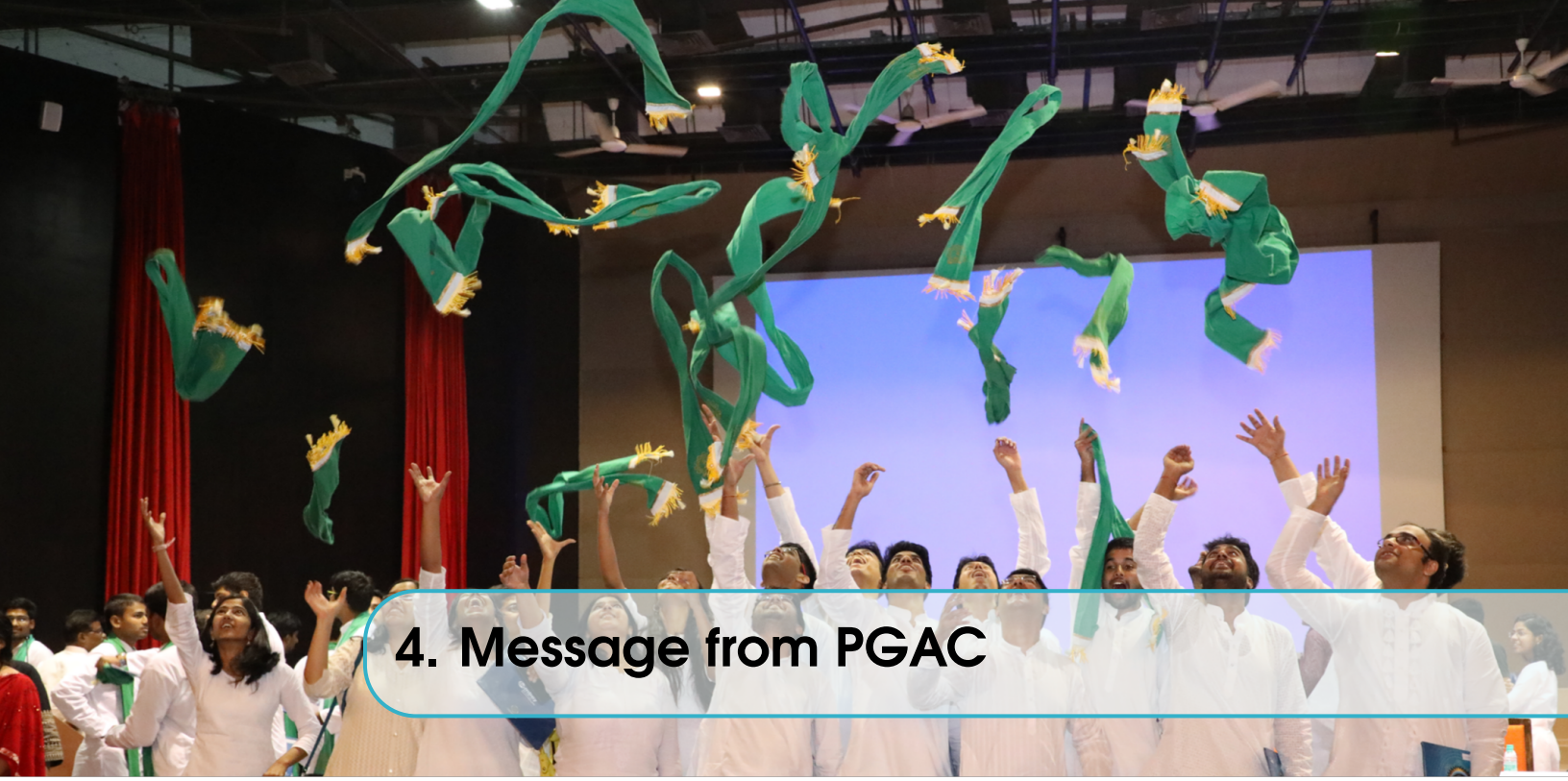

4. Message from PGAC

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.

Himanshu Bishwash
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5. LAB Facilities

1. **Wadhwani Electronics Laboratory (WEL)**
   (*3rd Floor , Department of Electrical Engineering*)
   Professor In-charge - Siddharth Tallur
   Relevant Specializations - for all specializations in EE

   The WEL houses all the major electronics hardware activities of the Electrical Department at IIT Bombay. Around 12 major laboratory course are conducted every year in WEL. Around 650 UG students and 250 PG and DD students enroll for lab courses annually. In addition to courses, WEL is also home to all major electronics projects done by students at IIT Bombay. Various Technical events are housed here, including electronics workshops,competitions, teachers' training etc.

2. **Signal Processing and Instrumentation Lab**
   (*1st Floor , Department of Electrical Engineering*)
   Professor In-charge - P.C Pandey
   Relevant Specializations - EE1 , EE5

   This lab focuses on research in the areas of speech signal processing, bio-medical signal processing & instrumentation, electronic instrumentation and embedded system design. The research problems being tackled by students in the lab include 'Enhancement of electroaryngeal speech using spectral subtraction' , 'Multi-band frequency compression for hearing impaired' , 'Speech enhancement by modification of stop consonant landmarks', 'Diagnostic information from impedance cardiograph' etc.

3. **Integrated Systems Laboratory**
   (*1st Floor, Electrical Annex Building, Opposite to EE main building*)
   Professor In-charge - Prof. Jayanta Mukherjee, Prof. Maryam Shojaei Baghini
   Relevant Specializations - EE1 , EE5 , EE6 , EE7

   Integrated Systems Laboratory at IIT Bombay is a simulations and testing laboratory located in the first floor of the EE Annex Building. Embedded system solutions are developed here. Primarily design and test of passive and active RF and circuits is done. EM design software like CST Microwave Studio, HFSS and Key sight ADS are installed in lab. Several Core i7 PC's with augmented RAM's to enable high end computing are also present. GPU based high end workstations for enabling fast EM solvers

for design at millimetre wave frequencies are available in lab. This lab work closely with the VLSI lab for RFIC simulations.

4. **Embedded System lab**
   (*5th floor, Girish Gaitonde (GG) building*)
   Professor In-charge - Prof. Maryam Shojaei Baghini, Prof. Madhav P. Desai
   Relevant Specializations - EE5 , EE6 , EE7

   The prime focus areas of lab are system design, prototyping and evaluation starting from sensor/transducer interfacing to full system development and network of sensor nodes, signal processing system design, analysis and implementation for various sensing-based applications, AI for ASIC design, sensor nodes and networks, deep learning for signal and data Analysis, hardware-accelerated simulation. Research work is also done in agricultural, bio-medical domains.

5. **Applied Integrated Micro Systems (AIMS) Laboratory**
   (*1st Floor, Electrical Annex Building, Opposite to EE main building*)
   Professor In-charge - Siddharth Tallur
   Relevant Specializations - EE5 , EE6 , EE7

   AIMS lab works on innovative instrumentation for impactful measurements. The research areas include sensor systems, hybrid integrated microsystems, studying their underlying physics to leverage such platforms for high resolution sensing applications.

6. **Photonics and Quantum Enabled Sensing Technology (P-Quest) Laboratory**
   (*2nd Floor, Department of Electrical Engineering*)
   Professor In-charge - Kasturi Saha
   Relevant Specializations - EE1 , EE7

   P-Quest lab works on exploring precision metrology and sensing using novel interdisciplinary research in fields like nano-photonics, classical and quantum information processing and life sciences, to develop practical quantum devices via design and experimentation, thus connecting quantum theory to engineering applications.

7. **VLSI Design Lab**
   (*5th Floor, Girish Gaitonde (GG) Building*)
   Relevant Specializations - EE5 , EE6

   The VLSI Design Lab hosts all major VLSI CAD Vendor's tool and their licenses .Few major tools in frequent use are by Synopsys, Cadence, Mentor, Agilent, Magma, Xilinx etc. The main research focus is in the area of analog and digital design. In addition to courses, this lab also hosts accounts for different courses which require hands on experience of tools. For different projects and their tape-out, there is availability of a high performance computational server to speed up the simulations.

8. **Signal Processing and Artificial Neural Networks (SPANN)**
   (*3rd Floor, Department of Electrical Engineering*)
   Professor In-charge - S.N. Merchant
   Relevant Specializations - EE1

   The major areas of research which are pursued in SPANN Lab include Wireless Communications, Sensor Networks, Image Processing and Signal Processing.

9. **Information Networks Laboratory**
(*2nd Floor, Department of Electrical Engineering*)
Professor In-charge - Prasanna Chaporkar and Abhay Karandikar
Relevant Specializations - EE1

   Group members of the lab are pursuing research in the field of 4G and 5G cellular technologies, with an emphasis on inter-working with non-3GPP Wireless Local Area Networks (WLANs). Other important focus areas of the lab include-mechanisms for spectrum sharing and multi-cast for 4G networks, integrated access and backhaul systems, multi-connectivity in 5G networks and Software Defined Networking (SDN) for cellular networks and WLAN. The TTSL - IITB Center of Excellence in Telecommunication (TICET) facility is also a part of this lab.

10. **Texas Instruments Digital Signal Processing Lab (TIDSP)**
(*3rd Floor, Department of Electrical Engineering*)
Professor In-charge - V.M. Gadre
Relevant Specializations - EE1 , EE5

    TIDSP laboratory was set up in the EE Department to support DSP hands-on projects at the undergraduate and the postgraduate levels. DSP specific hardware and software support is provided by Texas Instruments (TI) itself.

11. **Fiber-Optics Communication Lab**
(*2nd Floor, Department of Electrical Engineering*)
Professor In-charge - Kumar Appaiah , Joseph John
Relevant Specializations - EE1 , EE5

    This lab is dedicated to pursue research mainly in the area of optical fiber communication (SM, MM, FM), plastic optical fiber and fiber sensing.

12. **Bharti Centre for Communication**
(*2nd Floor, Department of Electrical Engineering*)
Professor In-charge - D. Manjunath , Bikash Kumar Dey
Relevant Specializations - EE1

    The Bharati Centre for Communication is a centre to generate fundamental knowledge in telecommunication and allied systems. The Vision of the centre is to be an internationally recognised contributor in moving the frontiers of knowledge through research and education, to keep technology practise in focus and to educate for innovation and leadership.

13. **Vision and Image Processing**
(*, Department of Electrical Engineering*)
Professor In-charge -
Relevant Specializations -

    This lab is dedicated to Deep Learning, Computer vision techniques. The major projects currently undertaken are related to Haptics, Biometrics, Image segmentation, super-resolution, Anomaly detection and surveilling related problems. This lab consists of more than 23 GPU, and high-performance computer to work on the mentioned techniques. Research is currently heading in the direction of surveillance such as aerial and single camera view. The task involves are human pose estimation, scene understanding, object detection, etc.

14. **PC Lab**

(*1st Floor, Department of Electrical Engineering*)
Professor In-charge -
Relevant Specializations - For all specializations in EE

15. **Digital Audio Processing Lab**
(*„ Department of Electrical Engineering*)
Professor In-charge -
Relevant Specializations -5

This lab is based on the application of signal processing in the analysis of speech and audio. Research activities are related to spoken language assessment, music content analysis, measuring the goodness of instruments like Tabla, segmentation of instruments in the music concert and other application of speech and audio processing.

16. **Communication Lab**
(*1st Floor, Department of Electrical Engineering*)
Professor In-charge - Shalabh Gupta
Relevant Specializations - EE1 , EE5 , EE6

Communication Lab primarily focuses upon cutting edge research in the area of High speed Communication Links. It can further be divided into different domains like High speed Links using Optical Communication, Silicon Photonics, SerDes (Serialiser and Deserialiser) Links, RF Circuits and Millimetre-wave circuits and Systems. Besides it is also working in the domain of RF Electronics, Embedded Systems and Audio Video Communication for some of its projects.

17. **Networking Lab** (*2nd Floor, Department of Electrical Engineering*)
Professor In-charge - D. Majunath
Relevant Specializations - EE1

The work in the Networking lab deals with the theoretical aspects of queuing theory, sensor networks, applications of stochastic approximation, software routing etc.

18. **Microwave and Antenna Lab**
(*3rd Floor, Department of Electrical Engineering*)
Professor In-charge - Girish Kumar
Relevant Specializations - EE1

Microwave Lab is involved in research work in the area of RF Systems, Electromagnetic Waves and Antenna Design. Primary research work is being done in different fields like Micro-strip Antenna, Microwave Integrated Circuits and Broadband Antennas.

19. **TTSL-IITB Centre of Excellence in Telecommunications (TICET)**
(*2nd Floor, Department of Electrical Engineering*)
Professor In-charge -
Relevant Specializations - EE1

TICET focuses on state of art research in telecom relevant to Indian Service Providers in general and Tata Teleservices Limited (TTSL) in particular with special emphasis on rural wireless applications and connectivity. The research activities in this lab are related to Quality of Service and resource allocation in wired/wireless networks,TV White Space and its potential for affordable broadband access in India, Frugal 5G and rural broadband research and standardization.

20. **Medical Deep learning and AI Lab (MeDAL)**
(*1st Floor, Department of Electrical Engineering*)
Professor In-charge - Amit Sethi , Manoj Gopalkrishnan
Relevant Specializations - EE1

    This lab is dedicated towards solving real world problems in the areas of medical imaging, radiology and pathology using deep learning architechtures. This lab houses high end computing facilities to work with large scale data (Giga pixel images) to solve various computer vision problems. Research group have colloboration with various hospitals and universities. Some ongoing engagements are with TATA memorial hospital, University of Illinois and King's college London.

21. **Information Systems and Radios (ISR) Lab**
(*2nd Floor, Department of Electrical Engineering*)
Professor In-charge - Sibi Raj Pillai
Relevant Specializations - EE1

6. Faculty Members

6.1 EE1: Communication and Signal Processing

Faculty	Office	Research Interests
Prof. Prasanna Chaporkar	•	Resource Allocation and scheduling in wired/wireless networks, Optimization and control of stochastic systems, Distributed systems and algorithms
Prof. Subhasis Chaudhuri	•	Multimedia, Computer Vision, Image Processing, Pattern Recognition,Biomedical Signal Processing, Computational Haptics
Prof. Vikram M. Gadre	Room no 233A 2nd floor EE building	Communication and signal processing, with emphasis on multiresolution and multi-rate signal processing, especially wavelets and filter banks: theory and applications
Prof. Shalabh Gupta	Room No: 118 1st Floor EE Building	High-speed CMOS analog/RF/mm-wave integrated circuits and systems,Optical fiber communication systems, Microwave photonics / ultrafast data conversion using photonics , Beam forming antenna systems, Signal processing for these systems
Prof. Joseph John	•	Analog and Digital Circuits, Optical Fiber Communications, Indoor Optical Wireless Systems, Modern Electronic Systems and Instrumentation
Prof. Abhay Karandikar	•	Control and Performance Modeling of Wireless Networks, Quality of Service and Resource Allocation in Wired/Wireless Networks, Next Generation Wireless Network Protocols (related to 802.16m, LTE-Advanced and 4G Standards), Co-operative Relay and Self Organizing Network,Carrier Ethernet and Mobile Backhaul, Rural Wireless Network
Prof. Gaurav S. Kasbekar	Room 211-B 2nd floor EE Building	Modeling, design and analysis of wireless networks, Game theoretic and economic aspects of spectrum allocation, Cognitive radio networks, Lifetime and coverage problems in wireless sensor networks
Prof. Animesh Kumar	Room No: 232 B 2nd Floor EE Building	Signal processing, communication systems, applied statistics, SRAM reliability models

Prof. Girish Kumar	•	Microstrip antennas and arrays, Broadband antennas, Microwave integrated circuits, EMI/ EMC, RF communication circuits
Prof. D. Manjunath	•	Computer and Communication Network Protocols, Systems and Algorithms Performance Modeling, Queueing Theory and Simulation, Stochastic Systems
Prof. Shabbir Merchant	•	Signal Processing, Adaptive Signal Processing
Prof. Prem C. Pandey	•	Speech and Signal Processing, Biomedical Signal Processing and Instrumentation,Electronic Instrumentation, Embedded Electronic System Design
Prof. Sibi Raj B Pillai	•	Fundamental Limits of Communication Systems, Information Theory and its applications, Compressed Sensing, Stochastic Modeling, Resource Allocation Problems, Interference Channels, Relaying and Broadcasting
Prof. Bikash Kumar Dey	•	Information Theory, Coding Theory, Wireless communication.
Prof. Preeti Rao	Room 232-A 2nd Floor EE Building	Speech and Audio Signal Processing, Music Information Retrieval
Prof. Rajbabu Velmurugan	MedAL Lab 1 st Floor EE Building	Statistical and digital signal processing, Signal processing system design, Particle filter applications, Target tracking systems
Prof. Saravanan Vijayakumaran	•	Signal Processing for Communications, Parallel Simulation Algorithms
Prof. Nikhil Karamchandani	Room 331-B 3rd Floor EE Building	Information Theory, Networks, Communications,Distributed Computation, Cyber-Physical Systems.
Prof. Kumar Appaiah	•	Signal processing for communication, fibre optics, wireless communication.
Prof. Jaykrishnan U. Nair	Room 237-D EE Building	Queueing theory, Communication networks, Heavy tails.
Prof. Manoj Gopalkrishnan	Room 331-D 3rd Floor EE Building	Algorithms in nature,Information processing in networks,Reaction networks,Neural networks,Evolution,Game theory,Deep learning,Information geometry,Thermodynamics of information,Quantum Information
Prof. Amit Sethi	Room No. 200 . 2nd Floor EE Building	Computational pathology,Medical image analysis,Deep learning,Machine learning,Computer vision,Image processing,Signal processing
Prof. Sharayu Moharir	•	Modeling and the design of scalable resource allocation algorithms for large networks, including content delivery networks, communication networks and crowd-sourcing.

6.2 EE2: Control and Computing

Faculty	Office	Research Interests
Prof. Madhu N. Belur	Room 237A, Second floor, main EE building, Department of Electrical Engineering	Control theory, dissipative systems, graph theoretic methods, decentralized control, behavioral theory control, Fault diagnosis
Prof. Vivek Shripad Borkar	EA202, EE Annexe, Department of Electrical Engineering	Stochastic Control, Learning Control Theory, Random Processes
Prof. Debraj Chakraborty	New Office Complex, 1st floor EE (next to PC Lab), Department of Electrical Engineering	Optimal Control, Linear Systems, Optimization, Differential Games,Game Theory
Prof. Prasanna Chaporkar	Room 231B,Second floor,main EE building,Department of Electrical Engineering	Resource Allocation and scheduling in wired/wireless networks, Optimization and control of stochastic systems, Distributed systems and algorithms
Prof. Subhasis Chaudhuri	Room 231A,Second floor,main EE building,Department of Electrical Engineering	Multimedia, Computer Vision, Image Processing, Pattern Recognition,Biomedical Signal Processing, Computational Haptics
Prof. Shrikrishna V. Kulkarni	211-C, Department of Electrical Engineering	Transformers: Design, Analysis and Diagnostics, Electromagnetic and Coupled Field Computations, Power Engineering: Distributed Generation, High Voltage Engineering: Insulation Design/Diagnostics
Prof. Debasattam Pal	Room No 231-D 2nd Floor EE Main Building	Distributed parameter systems, algebraic analysis, optimal control.
Prof. Virendra R. Sule	New Office Complex, 1st floor EE (next to PC Lab), Department of Electrical Engineering	Cryptology: Block and stream ciphers, efficient arithmetic for public key cryptography, algebraic cryptanalysis, Dynamical systems and feedback control theory
Prof. Dwaipayan Mukherjee	Room no EE 214D, 2nd floor EE Main Building	Multi-agent Systems,Consensus,Formation Control,Control Theory and Robust Control
Prof. Harish K. Pillai	231-D,EE Main Building 231-D,EE Main Building	Control theory, Systems theory, Multidimensional systems, Numerical and computational methods, Coding theory, Optimization techniques, Electromagnetics

6.3 EE3: Power Electronics and Power Systems

Faculty	Office	Research Interests
Prof. Vivek Agarwal	•	Power conversion: New converter topologies, High frequency link power conversion, ZCS-ZVS configurations, Switched Capacitor DCDC converters, Power quality issues: Power factor correction techniques, Static VAR compensation, Active filters
Prof. Mukul C. Chandorkar	•	Power Electronics, Power quality, Static Compensation, Motor Drives
Prof. Kishore Chatterjee	Room 032 Ground Floor EE Building	Utility friendly converter topologies, Power Factor Correction techniques,STATCOM, Switched Mode Rectifiers, Electronic Ballast
Prof. Baylon G. Fernandes	Head's Room EE Office	Inverter topologies for VAR compensation, Power electronic interface for non-conventional energy sources, Permanent magnet machines for wind power generation, Switched reluctance machines for electric vehicle application
Prof. Shrikrishna A. Khaparde	•	Deregulation in Power Industry: optimal bidding, and congestion management,Object Oriented Power System Analysis, Controlled series compensation using SSSC, Harmonic Distortion in Distribution systems, Design and Operation of small tidal power plant, Modeling and Design of transformer
Prof. Shrikrishna V. Kulkarni	Room 211-C 2nd Floor EE Building	Transformers: Design, Analysis and Diagnostics, Electromagnetic and Coupled Field Computations, Power Engineering: Distributed Generation, High Voltage Engineering: Insulation Design/Diagnostics
Prof. Anil Kulkarni	Power Systems Laboratory Gnd Floor EE Building	Power System Dynamics and Control, Application of Power Electronics to Power Systems, Flexible AC Transmission Systems
Prof. Prem C. Pandey	•	Speech and Signal Processing, Biomedical Signal Processing and Instrumentation,Electronic Instrumentation, Embedded Electronic System Design
Prof. Anshuman Shukla	Room 237-D 2nd Floor EE Building	Multilevel converters and Modulation and control of power electronic converters, Power electronics applications in power systems (FACTS,HVDC, custom power devices, etc.), Renewable energies and Energy storage, Control of electric drives, Hybrid and solid-state circuit breakers and current limiters
Prof. Shreevardhan A. Soman	Room 224 2nd Floor EE Building	Power system analysis, computation and economics, Power system protection
Prof. Anupama Kowli	Room 231-B 2nd Floor EE Building	Power System Planning, Operations and Control, Electricity Markets and Economics of Electric Power Grids, Demand-side Management, Demand Response and Flexible Loads, Smart Grids and its Enabling Technologies and Mechanisms, Policy and Regulation for Electric Power Grids.
Prof. Himanshu J. Bahirat	•	Renewable Energy Sources; Grid Integration of Renewable Energy; Offshore Wind Energy; Transients in Power Systems; DC Power Systems; DC Wind Farms; Multi-terminal DC Networks; Circuit Breakers; Power Electronics.

6.4 EE5: Electronic Systems

Faculty	Office	Research Interests
Prof. Madhav P. Desai	•	VLSI Circuits and Systems, VLSI design and design automation,Graph theory and combinatorics.
Prof. Siddhartha P. Duttagupta	Room 110-A 1st Floor EE Annexe	Microelectronics, Micro/Nano Sensor Technology Optimization and Application, Sensor Integrated Electronic Circuits and Systems- Design
Prof. Vikram M. Gadre	Room 233-A 2nd Floor EE Building	Communication and signal processing, with emphasis on multiresolution and multi-rate signal processing, especially wavelets and filter banks: theory and applications
Prof. Shalabh Gupta	Room 118 1st Floor EE Building	High-speed CMOS analog/RF/mm-wave integrated circuits and systems,Optical fiber communication systems, Microwave photonics / ultrafast data conversion using photonics , Beam forming antenna systems, Signal processing for these systems
Prof. Joseph John	•	Analog and Digital Circuits, Optical Fiber Communications, Indoor Optical Wireless Systems, Modern Electronic Systems and Instrumentation
Prof. Shabbir Merchant	•	Signal Processing, Adaptive Signal Processing
Prof. Prem C. Pandey	*	Speech and Signal Processing, Biomedical Signal Processing and Instrumentation, Electronic Instrumentation, Embedded Electronic System Design
Prof. Sachin Patkar	•	Combinatorial optimization Matroid Theory Submodular Functions Linear/Integer programming Network Flows High Performance Computing FPGA-based accelerated computing GPU based acceleration High Performance Circuit Simulation Algorithms Design and Analysis
Prof. Preeti Rao	•	Speech and Audio Signal Processing, Music Information Retrieval
Prof. Dinesh K. Sharma	Room 232-A 2nd Floor EE Building	MOS device modeling VLSI design and technology. Microelectronics - technology and device characterization mixed signal design
Prof. Virendra Singh	•	Computer Architecture Processor architecture and microarchitecture VLSI Testing Fault-tolerant computing Robust design and architectures Self-healing system design SoC/NoC design and test Post Silicon Debug High level synthesis Formal verification.
Prof. Maryam Shojaei Baghini	•	Analog/Mixed-signal VLSI design and test (SoC, LV, LP, LE, Bio- medical/Biosensors, Bio-inspired circuits and systems, I/O, highly precise circuits and systems, instrumentation, energy harvesting and many more applications), Specific technologies and performance-optimized Analog/mixed-signal/RF circuits and systems for healthcare applications.
Prof. Rajesh H. Zele	Room 112 EE Annex	RF, Analog and Mixed-Signal Circuits for Communication Applications.
Prof. Prof. Siddharth Tallur	Room 109 1st Floor EE Annex	RF MEMS, Photonics, Opto-Mechanics, Micro- and Nanofabrication, Sensor Systems.

6.5 EE6: Integrated Circuits

6.6 EE7: Solid State Devices

7. Department Activities

7.1 Student's Reading Group (SRG):

The SS Students' Reading Group (SRG) was started in 2015 as an interactive peer review basedplatf orm to share knowledge and research issues from various domains of Electrical Engineering. The 5 specializations of EE department are divided into 4 clusters and researchers from every cluster present and discuss their work with their peer in the talks that are conducted throughout the semester. The sessions are entirely student run, giving the speakers a unique opportunity to present their ideas freely and receive reviews from the students alone.

New phase of SRG begins every semester. A 5 minute research challenge (5MR) is conducted in each phase where the participants get 5 minute to put forward their research ideas. A panel of faculty members decides the best speakers who are then awarded. The 5MR challenge is aimed at improving the technical communication skills of the student.

7.2 Department Academic Assistance Program (DAAP):

Department Academic Assistance Program (DAAP) is a helping hand to the students who are facing challenges in their academics. A student can face academic related issues due to various reasons, like unacquaintance with highly competitive environment at IIT, managing the academic workload and assignment timelines, unclear about field of interest etc. We believe that a little help from an experienced friend can make a difference. We provide one to one assistance through regular meetings. Assistants are student who have already excelled in the concerned field/course. They can complement classroom learning by providing techniques to manage course content effectively and sharing the resources. Since the inception of this program we have observed an improvement in the performance of more than 15 students. DAAP is creating a better environment for knowledge sharing and learning with joy!

7.3 IEEE Students Chapter:

The IIT Bombay IEEE Students' Chapter is a student body that strives to promote excellence in various fields of electrical engineering. The organization is involved in organizing talks, workshops and other activities to help students obtain new skills in their fields of interest.

7.4 Bridge Course:

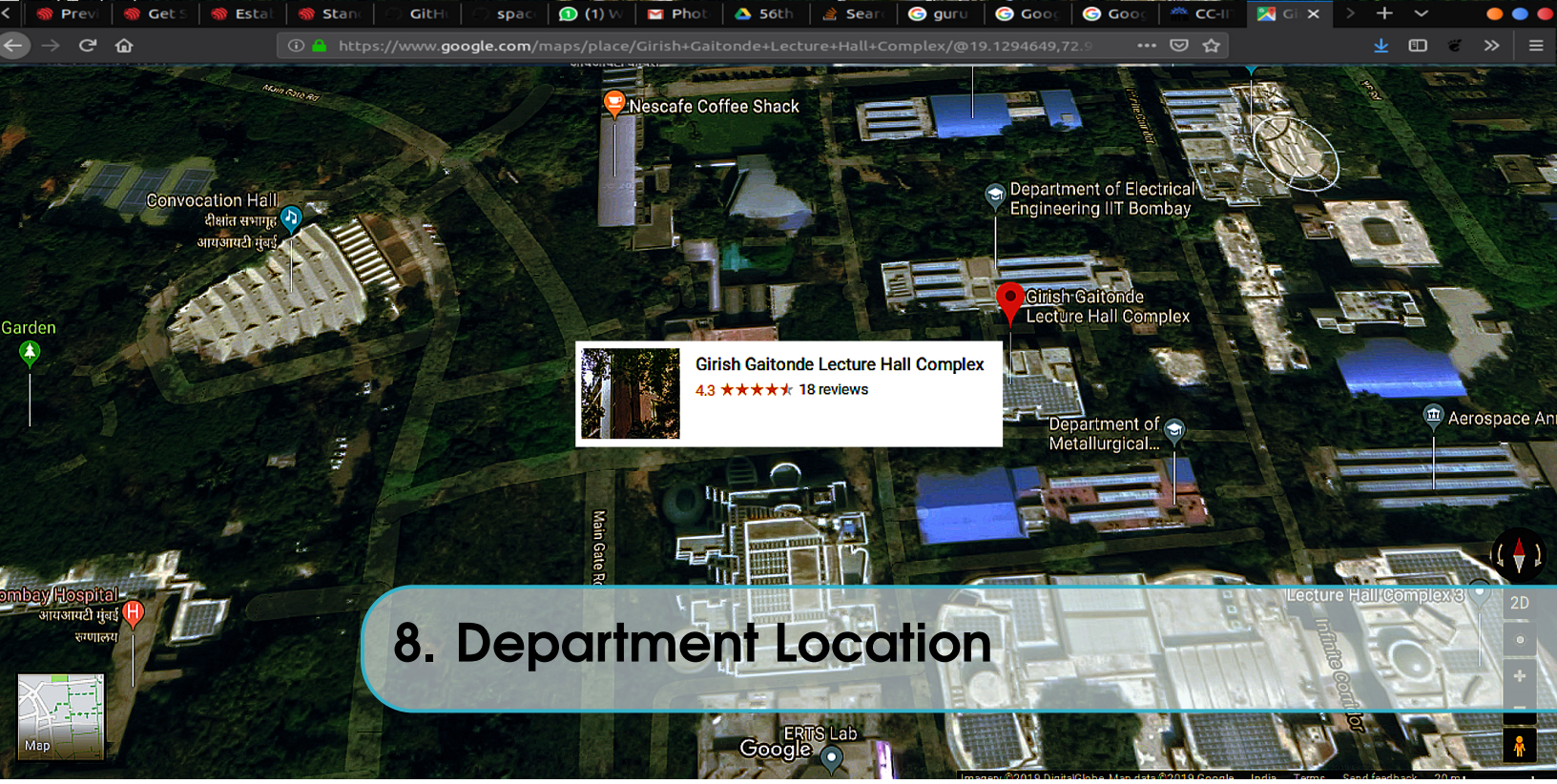
The Bridge Course, starting from 2016 is an initiative by the department to help new students of the M. Tech. and PhD programs which makes them comfortable with their coursework. The Bridge course focuses on revising essential prerequisites and developing analytical skill. It is felt that these two essential skills will help students to work on their courses more effectively.

7.5 AAVRITI (Department Techfest):

It is the annual research and technological festival of Electrical Engineering department of IIT Bombay. AAVRITI, with the motto of promoting technology, creativity, intelligence and sheer innovation, and to enthrall the magical impact of electronics that it has on the human civilization over the years aims to bridge the gap between industry & academia by encouraging exchange of ideas and providing opportunities for technical interactions.

It includes workshops on most advanced and buzzing technologies, lecture series by experts of particular fields as well as competitions and hackathons. This gives students a chance to expand their horizons and learn beyond engineering syllabus.

Other department activities include Teacher's day, Sports day, Department trip, Convocation ceremony, Valedictory function and so on.



Our department is large in terms of real estate. Our department is spread over various buildings:

1. **EE Building:**
   Behind the SJMSOM building. It Resides PC lab, WEL, PEPS labs, Signal processing and instrumentation lab.
2. **Girish Gaitonde Building:**
   Referred as GG Building mainly. Situated behind SJMSOM and connected to EE building. Resides EE office, Class rooms, VLSI design lab, Department Library, Embedded Systems Lab.
3. **Annex Building:**
   Situated across infinity corridor behind EE building. It resides Fabrication lab facilities.
4. **CEN Building:**
   Connected to annex building. Resides characterization labs. Faculty offices.

9. Department Student Representatives

9.1 Department placement coordinators

Arun Miryala	TBD	TBD
9497xxxxxx	7338******	TBD
rand@gmail.com	TBD	TBD

9.2 Company coordinators

Sourabh	Saurabh Suri	Shikha Das	Jay Adhadhuk
rand@gmail.com	rand2@gmail.com	rand3.gmail.com	jay@gmail.com

9.3 EE Student Assosciation

Posts relevant to a fresher Mtech student are mentioned here. For more information about EESA visit EESA website

SRG Overall-Cordinator	General Secretary	Cultural Secretary
TBD	Abhijeet Anand	TBD
TBD	*dgsec@ee.iitb.ac.in*	TBD
TBD	829147642	TBD

Sports Secretary (Boys)	Sports Secretary (Girls)
Prashant Sharma	BVS Anusha
183079037@iitb.ac.in	bvsanusha@ee.iitb.ac.in
9911155297	TBD

9.4 EE ISCP Team

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9.4.1 Links you should check out

- Department Website
- explore more at Clubs at IITB
- Insti App Know your Campus
- Institute Students Companion Program (ISCP)

Wish you all the best, ISCP Team