

# **M-Tech Admission Brochure**

**3-Years Programs**  
**Session: January, 2020**



भारतीय प्रौद्योगिकी संस्थान हैदराबाद  
Indian Institute of Technology Hyderabad

**Department of Electrical Engineering**  
**IIT Hyderabad**  
Kandi, Sangareddy  
Telangana: 502285

## **Overview:**

The Department of Electrical Engineering is the largest department at IIT Hyderabad that has 169 B-Tech students, 107 M-Tech students and 151 PhD scholars. The department has a sizable number of highly dedicated and dynamic faculty members. The current faculty strength of the Department of Electrical Engineering is 31 including 27 full time, 3 visiting, 1 Emeritus faculty. Candidates can discover the latest profiles and teaching/research areas of different faculty members by visiting <https://ee.iith.ac.in/faculty.html>.

The faculty members of the Department of Electrical Engineering are well versed with latest industrial practices and are continuously engaged in the endeavor to bridge the theoretical understanding and practical applications. Over a period of time, the Department of Electrical Engineering has developed strong industrial interactions. The continuous feedback received from industries has proven to be helpful to educate the students in a way so that they can develop ample skill to take up challenges in the real engineering world. The Department of Electrical Engineering believes in imparting holistic education. Nonetheless, development of the fundamental understanding is paid utmost importance so as to enable students to explore new solutions. The Department of Electrical Engineering provides an environment of mutual learning. Students are always encouraged to share their ideas rather than only following the instructions.

The M-Tech program in Electrical Engineering was started in 2009 and, till now, 8 M-tech batches have been graduated. The M-Tech students are considered as very useful assets to the department since they have significant role to play in the growth of the departmental footprint in the research arena. The M-Tech students are provided with excellent laboratory facilities that they can access at any time. Most of the M-Tech students who graduated till date are well placed in industry or academia. The Department of Electrical Engineering is in hunt of brilliant M-Tech students to develop highly skilled human resources who can electrically enrich the society.

## **Research Outcome of the Department:**

A summary of the overall research outcome of the Department of Electrical Engineering for the Academic Year 2017-2018 is presented below.

- 83 papers are published in reputed journals.
- 74 papers are published in peer-reviewed conference proceedings.
- 5 patents are filed.
- 11 research projects worth 84.70 crores are received.

## Research Laboratories:

The Department of Electrical Engineering houses 15 research laboratories equipped with state-of-the-art facilities including software and hardware. All the laboratories are provided with the internet connectivity.

<ol style="list-style-type: none"><li>1. Coding &amp; Communication Theory Lab</li><li>2. Renewable Energy and Power Systems Lab</li><li>3. PEPS Lab</li><li>4. Smart Power Applications and Renewables Control (SPARC) Lab</li><li>5. Immersive Multimedia and Telepresence</li><li>6. Laboratory for Video and Image Analysis (LFOVIA)</li><li>7. Electron Devices Research Lab</li><li>8. Dynamics and Control Lab</li></ol>	<ol style="list-style-type: none"><li>9. Speech Information Processing (SIP) Lab</li><li>10. Littlings Lab</li><li>11. Nanophotonics Lab</li><li>12. Advanced Embedded Systems and Digital IC Design Lab</li><li>13. Flexible Electronics and Nanodevices Lab</li><li>14. VLSI Research lab</li><li>15. Wireless Communications and Networking (WiCoN) Lab</li></ol>
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## M-Tech Specializations:

The Department of Electrical Engineering at IIT Hyderabad offers five different specializations for M-Tech studies. A summary of those specializations is provided below.

- **Communication and Signal Processing:** Communication engineering and signal processing form the basis of information engineering, and hence, are fundamental to a broad range of cutting edge technology and industries, including cellular and wireless communications, video and image processing systems, speech recognition and synthesis, internet of things, big data, cyber-physical systems, data storage systems, wireless networks, information forensics and security, medical imaging, optical communications and radar. This program provides a right mix of emphasis on theoretical fundamentals and exposure to practical aspects which enables our students to take on the challenges posed by the fast growing information technology sector and the latest research in academia and industries alike. The fundamentals of the program are based on random processes, digital signal processing, digital communications and information theory. The students can choose to specialize in specific areas of communication engineering or signal processing with a wide range of elective courses available to provide them with in depth knowledge in their area of interest.

- **Microelectronics and VLSI:** Microelectronics and VLSI stream provides deeper understanding in latest technologies related to the state-of-the-art electronic industry. A typical microelectronic engineer is expected to have a thorough knowledge of device physics, transistor level IC design, system level design and fabrication aspects. This forms the fundamental basis and is taught to students at a deeper level in the first two semesters of the course. Keeping in mind the latest trends in this field several intricacies related to nanotechnology, photonics, sensors, organic electronics 3D IC design and fabrication will be taught to students. Moreover, students are exposed to the full run of chip design starting from idea to tapeout. The Microelectronics and VLSI specialization comprises of 10 faculty members. Faculty members associated with the Microelectronics and VLSI specialization have the coverage ranging from device modeling/circuit design to device fabrication/circuit synthesis. Excellent computational and experimental facilities are available with the Microelectronics and VLSI group.
- **(NOT OFFERED IN THIS ROUND) Power Electronics and Power Systems:** The Power Electronics and Power Systems (PEPS) specialization offers courses on power system studies, power system protection, power system management, power system controllers, power electronic applications to power systems, power electronic circuits, power electronic controls and electric drives. The basket of available elective courses includes trendy subjects such as smart grid, multi-level inverters, grid integration of PV systems, wide area monitoring and so on. There are six full-time faculty members in the PEPS group. The faculty members of the PEPS group are engaged in research in all the forefront areas. Noteworthy research works are designing drives for electric vehicles, development of efficient converter topologies, controller design for microgrids, wide area damping controller design in a smart grid, and the development of financial mechanism for the power market.
- **(NOT OFFERED IN THIS ROUND) Systems and Control:** The Systems and Control program deals with the development of novel control theoretic techniques for large scale, complex plants. Developing and enhancing systems engineering aspects, such as design and management of complex systems, by innovative ways and means are some of the objectives of the program. At the core of the program are courses such as advanced control systems, nonlinear control, stochastic systems, optimization, etc. These courses are geared towards empowering students to undertake cutting edge research in the area of systems engineering and control theory.

## M-Tech Programs:

For the current session, the Department of Electrical Engineering at IIT Hyderabad offers the following M-Tech programs.

1. IITH Project Sponsored M-Tech 3-years program in the following two streams:
  - a. Microelectronics and VLSI Stream
  - b. Communication and Signal Processing (CSP)

## Eligibility Criteria for Application:

In order to earn eligibility to apply for a particular specialization, the candidate, first of all, must have BE/B-Tech background in any of the disciplines recognized by the respective M-Tech specialization. In overall, the following disciplines of BE/B-Tech studies are recognized as appropriate for the M-Tech admission at the Department of Electrical Engineering, IIT Hyderabad.

- Electrical Engineering (EE).
- Electronics and Communication Engineering (ECE).
- Electronics and Instrumentation (EI).
- Engineering Science (ES).
- Engineering Physics (EP)
- Mathematics and Computing (MC)

The applicant must have an earned BE/B-Tech degree or, at least, should be in the final year of undergraduate studies. In the latter case, it would be assumed that the candidate will be able to complete the BE/B-Tech degree by the time of M-Tech admission. The candidate should also have a valid GATE score from an appropriate paper or 6 months Experience at IIT Hyderabad Institute Project or 2 years of relevant external experience. The B-Tech disciplines and GATE papers recognized by individual specializations are summarized in the following table.

M-Tech Specialization	BE/B-Tech Discipline	GATE Paper Code
Communication and signal processing	EE/ECE	EC
Microelectronics and VLSI	EE/ECE/EI	EE/EC/IN
<b>(NOT OFFERED IN THIS ROUND)</b> Power Electronics and Power Systems	EE	EE
<b>(NOT OFFERED IN THIS ROUND)</b> Systems and Control	EE/EI	EE/EC/IN

**Selection Process:**

For admission to 3-years programs via any mode, candidates need to attend a written test and/or an interview. It is to be noted that the written test can be waived, but the interview is mandatory. There may as well be a preliminary shortlisting depending upon the GATE score and/or the academic background. Only those candidates who will satisfy the shortlisting cutoff will be called for written test/interview. The department reserves the right to set any cutoff for the shortlisting of M-Tech applications. In addition, the department has all the rights not to select anybody if no appropriate candidates are found.

**Application Process:**

IIT Hyderabad has a centralized online application portal for the M-Tech admission. Candidates are requested to visit <https://www.iith.ac.in/index.php/admissions/pg/> for the application format and the submission link.