**ECE at IIIT Hyderabad**

*Q. What is special about IIITH's B.Tech ECE curriculum?*

A: IIITH’s academic curriculum is not based on rote learning. Instead, we believe in making our students future ready by enabling them to proactively chart their career paths.

IIITH’s ECE curriculum is thus designed keeping two aspects in mind: (a) Make students competent in the fundamentals of various areas in Electronics, Communications and Signal Processing, and (b) Ensure students can explore and actively contribute to the frontiers of research in specific sub-disciplines. Towards achieving these goals, the curriculum is kept lean and focused on core ECE courses, and the required adjunct courses in math and IT.

Introductory courses in various sub-disciplines of ECE are introduced within the first two years of the UG program, along with the requisite math subjects. Our students also get to do practical, hands-on activities in the labs associated with these courses. This is unlike many traditional institutes, where students have to spend time with multiple generic (non ECE oriented) engineering courses in their first year.

For example, right in the first year of the UG programme, IIITH’s curriculum includes courses like Digital Systems and Microcontrollers, Networks Signals and Systems, Information and Communication, as well as Linear Algebra and Real Analysis which are math courses. In the second year, students have the freedom to choose from a number of stream electives, which enable them to get a taste of research-oriented specializations at IIITH via the curriculum.

We envision an exciting future for ECE disciplines, and our curriculum is designed to enable students to play an active role in shaping it.

*Q: IIITH is known for its research orientation. What are the opportunities for undergraduate ECE research at IIITH?*

One of IIITH’s USPs is its undergraduate research activity. Research groups at IIITH that include a good share of UG students are often at the forefront of their respective research disciplines, on par with top-tier international universities across the world.

With research being IIITH’s prime focus, ECE is organised into a number of research centres - *Signal Processing and Communications Research Centre (SPCRC), Center*
for VLSI and Embedded Technologies (CVEST) and Robotics Research Centre (RRC). Two other centres too come under the ECE banner - Language Technologies Research Centre (LTRC) and Center for Vision and Image Processing (CVIT). Faculty members associated with these centres work with their research groups, consisting of PhD students, Master’s students, and highly motivated Dual-Degree/B.Tech students as well. This gives the UG students (both in B.Tech and the DD programs) excellent exposure to the active thinking about current problems in their field of interest, and the creative and collaborative process of proposing and executing solutions to such problems. This holds them in good stead when they apply to international universities for their higher education. Further, industry recruiters often are aware and very appreciative of the efforts put forth by IIITH’s UG students in terms of research.

At ECE, UG students get to work on a variety of modern research areas including Low Power Circuit Designs for Modern Devices, Flexible Electronics, Biomedical Instrumentation, Communication systems for 5G and beyond, Sparse Signal Learning and Processing, Biophotonics, IoT and Embedded Systems, Communication theory for Unmanned Aerial Vehicles (UAV), Information and Coding theory for Distributed Storage, Privacy aspects of Communication Systems, Quantum Computing aspects of Communications, DNA Data Storage, Speech Analytics and Processing, Robotics, and many more.

**Q: Can we do AI-ML related courses in the ECE programme?**

A: Of course! One cannot understate the importance of AI-ML with respect to the future of all engineering disciplines, including ECE. Keeping this in mind, a number of related electives are available for students to credit during their ECE programme. ECE students can do both foundational AI-ML courses as well as various other applied AI-ML courses.

For instance, courses like Statistical Methods in Artificial Intelligence, Machine Learning, Computer Vision, Image Processing and Speech Technology are open to students in the third and fourth years of the ECE programme.

**Q. What do the alumni do after graduation?**

A: Regarding placements, ECE graduates from IIITH have gone to work for all reputed companies like NVidia, Qualcomm, Google, Broadcom, Xilinx, Texas, Motorola, Synopsys, Samsung, Amazon, Apple, Infosys, TCS, Oracle etc. The
average salary packages have been close to CS graduates from IIITH. More details on placements at http://placements.iiit.ac.in/.

Regarding higher studies, ECE graduates from IIITH have gone to top international colleges across the globe for their Master’s/PhD. To name a few - MIT, CMU, Georgia Tech, NC State University, Rice University, University of SC in US; INRIA in France, Aalto University in Finland, University of Luxembourg, McGill in Canada and Imperial College, London, UK.

**Know more:**

For more details, feel free to check out the webpages of the respective centres. They contain recent updates regarding these centres, the kind of research problems they focus on, funded projects, and much more!

1. CVEST - http://cvest.iiit.ac.in/
2. SPCRC - https://spcrc.iiit.ac.in/
3. RRC - https://robotics.iiit.ac.in/
4. LTRC - https://ltrc.iiit.ac.in/
5. CVIT - https://cvit.iiit.ac.in/

You can also check out some of the videos below which introduce students to various research centres and the UG ECE programmes.

1. BTech and Dual Degree at IIITH -
   https://www.youtube.com/watch?v=-RKHXptyAOE
2. Intro to Centre for VLSI and Embedded Systems - CVEST
3. Intro to Signal Processing and Communications Research Centre: Signal Processing and Communication Research Center at IIITH
4. Intro to Speech Lab at LTRC: Speech Processing Lab at LTRC
5. Intro to Robotics Lab: Robotics Research Center at IIITH
6. IoT aspects and more on the UG ECE programs (Talk by Professor Sachin Chaudhari (SPCRC-IIIT)) - https://www.youtube.com/watch?v=ROfp571n5l0

7. Bits, Signals and Diversity (Talk by Professor Lalitha Vadlamani (SPCRC-IIIT)) - https://www.youtube.com/watch?v=C9yYmqlZsl8

8. "Flexible Electronics for a Rigid World” (Talk by Professor Aftab M Hussain (CVEST-IIIT) - https://www.youtube.com/watch?v=H7qQ56RMj4M

9. Excitement of ECE at IIITH (a discussion with UG ECE students from 2020)