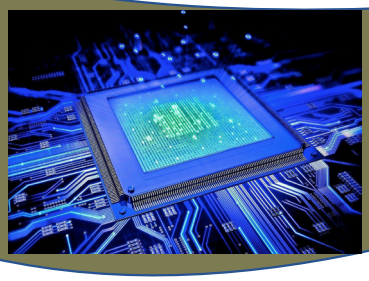
IIIT BHAGALPUR

INFORMATION BROCHURE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

TABLE OF CONTENT



Overview of Department of Electronics & Communication Engineering

Indian Institute of Information Technology Bhagalpur started functioning from August, 2017 with two departments, namely, Computer Science Engineering and Electronics and Communication Engineering. The Department of Electronics & Communication Engineering is developed in response to the needs of industry, this course will give you advanced level knowledge and skills in the design of complex electronic and communication systems.

The major objective of the department is to impart high-quality education and to encourage the students in pursuing research. We aim to produce graduates who high-tech, greatly sought-after professionals with specialist understanding and skills in communication, but who also have a firm knowledge of electronic engineering as a whole. The unique blend of CSE and ECE have made our students competent to face the tough challenges of ECE branch with emphasis on Communications, DSP, Microelectronics, VLSI, IoT & Embedded Systems, Image Processing and Computer Vision, Microwave Engineering Robotics coupled with coding and other IT perspectives. Our department has great infrastructure and facilities to bring practical knowledge at par with the global competitive environment.

Vision & Mission of the Department

01 To inculcate analysis and design for innovative problems in the field of electronics and communication engineering with the help of state of art curriculam.

02 To impart practical training to face real-life case studies and inter-disciplinary simple solutions to complex problems..

03 To make engineering education an enjoyable learning experience through chalenging tutorials, mini-projects, assignments and laboratory exercises.

04 To build a project team spirit for a professional working environment with high ethical values.

05 To Provide students with an abundance of research opportunities in leading edge areas of electronics and communications engineering, particularly signal processing, communications, VLSI & embedded systems.

Message from Head of Department

Welcome to the Department of Electronics & Communication Engineering at IIIT Bhagalpur. The total sanctioned strength of the department is 60 and likely to be increased to 75 students per session. The M. Tech and PhD program is likely to be started soon in near future. To keep pace with the evolving technology, there is an increasing demand for man-power with engineering potential who is analytical, creative, and logical, a problem solver, a realist, who is versatile and forward thinking. To meet this demand, ECE department at IIIT Bhagalpur has been setting exemplary standards since its inception and is well on course to continue the tradition for years to come. Our Department of ECE grooms the students to excel in the field of technology with a traditional and broad-based course which aims to produce well-rounded engineers with a high level of analytical and engineering design skills. Trained in both software and hardware skills and basic inputs to make them self-confident, our students are equipped to work in industry and pursue higher studies. Our motto being to upgrade the skills and knowledge of our young engineers to enable them to survive best in the best competitive world.

This information brochure contains the details of academic programs, curriculam and research carried by faculties and the students of the department. Our department has qualified and dedicated faculty members to provide good technical support and give individual attention to all the students. The vision to become a centre of excellence in the field of communication system, embedded systems, VLSI & Microelectronics. We hope that we will continue to deliver our best to serve the society and expect our students to pass on the skills that they have developed during their interaction with our department.

Dr. Dheeraj Kumar Sinha
Head
Department of ECE
Email: hod.ece@iiitbh.ac.in
Contact No: +91-7632995205

People

Faculty Members

Prof. Arvind Choubey
Director & Professor

Dr. Dheeraj Kr. Sinha
Head & Asst. Professor

Dr. Sandeep Raj
Asst. Professor

Dr. Prakash Ranjan
Asst. Professor

Dr. Sanjay Kumar
Asst. Professor

Dr. Suraj
Asst. Professor

Technical Staffs

Mr. Kr. Sheelvardhan
Jr. Tech. Superintendent

Mr. Rajan Kumar
Jr. Tech. Superintendent

Electronics & Communication Engineering Curriculum (B.Tech)

VLSI & Embedded Systems

- Digital Design
- Semiconductor Devices & Circuits
- Analog Electronics
- Microprocessor & Interfacing
- IoT & Embedded Systems
- Analog & Digital IC Design
- VLSI System Design using Verilog

CS & IT Courses

- Computer Programming
- Data Structure & Algoraithm
- Object Oriented Programming
- Computer Organization
- Artificial Intelligence
- Machine Learning
- Cloud Computing

Signal Processing

- Signals & Systems
- Digital Signal Processing
- Computer Vision & Image Processing
- Biomedical Image Processing
- Speech & Video Processing

Microwave & Communication

- Analog & Digital Communication
- Electromagnetic Theory
- Recent Trends in Wireless Communication
- Antenna & Microwave Engineering
- Optical Communication

Elective & Other Courses

- RF Integrated Circuit Design
- Information Theory & Coding
- Computational Electromagnetics
- Biomedical Instrumentation
- Mathematics-I, II, III
- Professional Ethics & Foreign Language
- Probability and Random Process
- Computational Intelligence

Facilities & Resources

Analog & Digital Electronics Laboratory

The Analog & Digital Electronics Laboratory is accessible to undergraduate students of all the departments. The objective of this laboratory is to link the theoretical concepts of different analog and digital electronics circuits with practical feasibility by giving to the students a scope to learn analog circuits and digital circuits in a better way. This laboratory is useful for beginners to understand the basic fundamentals of analog and digital circuits. The lab is well equipped with manufactured analog and digital electronic ICs, so students can fabricate their own circuit on the breadboard. The lab is well equipped with hardware such as DSO, function generator, DC power supply and supporting software like NI multisim, LTspice.

Digital Signal Processing Laboratory

Our laboratory presents an opportunity for students to check out their signal processing algorithms, from students' laboratory experiments to high-level research topics, in real situations. The lab is well equipped with 31 number of high performance computers. Software packages such as MATLAB with Simulink and Code composer studio are installed in the systems. The lab has Texas Instruments DSP kits for carrying out various advanced experiments.

Communication Laboratory

In this laboratory, our students are trained for constructing the circuits for analog and digital modulations. The concepts of all type of modulation & demodulation, and recent communication techniques are demonstrated using available hardware and software defined radio (SDR) tool. The lab is well equipped with 04 channel 200MHz Digital Storage Oscilloscopes, Arbitrary function generators, Pulse generators, communication trainer kits, digital multi-meter, Analog & Digital ICs, general purpose ICs, etc.

Facilities & Resources

VLSI & Embedded System Laboratory

This Laboratory is well equipped for challenging analog, digital and mixed signal IC design and validation. The lab also has a very rich wealth of state-of-art servers, systems and tools for design and testing which includes Hardware Facilities, EDA tools, Software and Library. While retaining the salient features of Microelectronics & VLSI stream, the courses includes lecture and laboratory based courses specially designed to cater to the needs of the industry both in the core subjects and through electives. In laboratory sessions, students are trained to design system level project to physical layout of ICs through available tools and hardware in the laboratory. .

Antenna & Microwave Engineering Laboratory

This Lab supports intermediate and advanced courses in Electromagnetics and Microwave Engineering. Students experiment with transmission line propagation, antennas and microwave circuit components. The microwave laboratories provide the necessary hardware & software support for training the students in the area of RF and Microwave Engineering. It offers design, analysis and simulation of various components and devices to understand the basics of RF and microwave engineering, to boost the quality of engineering education, deepen understanding, and provide the necessary practical skills to young minds. .

Design Laboratory

Design Lab is being used for the Major and Mini Project of the Final year undergraduate students of ECE Branch. It contains the hot air SMD Rework Stations, Printed Circuit Board 3D Printer. SMD can perform conventional through-hole soldering and newer SMT soldering. The stations allow for quick and simple IC attachment and detachment through the use of solder paste and the hot air tool. The 3D printer greatly expands the possibilities for enclosing final project circuits in compact, customized boxes and housings.

Research Activity

Research Publications Since 2017

- Prakash Ranjan, Chetan Barde, Arvind Choubey, Santosh Kumar Mahto, Wide band polarization insensitive metamaterial absorber using lumped resistors, SN Appl. Sci. 2, 1061, May-2020.
- Prakash Ranjan, Santosh Kumar Mahto, Arvind Choubey, The Binary Wind Driven Optimization Algorithm and its Application in Antenna Array and Pixelated Metasurface Synthesis, IET- Microwaves, Antennas & Propagation, IET, 13, 1751-8725, 1263 – 1270, 2019.
- Prakash Ranjan, Arvind Choubey, Santosh Kumar Mahto, Rashmi Sinha, Chetan Barde, A novel ultrathin wideband metamaterial absorber for X-band applications, Journal of Electromagnetic Waves and Applications, Taylor & Francis, Vol. 33, pp. 2341-2353, Nov. 2019.
- Kunal Singh, Sanjay Kumar, Pramod Kr Tiwari, A. B. Yadav, Sarvesh Dubey and Satyabrata Jit, "Semianalytical Threshold Voltage Model of a Double-Gate Nanoscale RingFET for Terahertz Applications in Radiation-Hardened (Rad-Hard) Environments", Journal of Electronic Materials, Vol. 48, pp. 6366-6371, Oct. 2019.
- Sweta Chander, Srimanta Baishya, Sanjay Kumar, P. K. Singh, Kamlaksha Baral, and Satyabrata Jit, "Two-Dimensional Analytical Modelling for Electrical Characteristics of Ge/Si SOI-Tunnel FinFETs", Superlattices and Microstructures, Vol. 131, pp. 30-39, Aug 2019.
- Dheeraj Kumar Sinha, M. S. Ansari, Ashok Ray, Gaurav Trivedi, Amitabh Chatterjee and Ronald D. Schrimpf, "Fast Ionization-front Induced Anomalous Switching Behavior in Trigger Bipolar Transistors of Marx-bank Circuits Under Base-drive Conditions" IEEE Transactions on Plasma Science, Vol. 46, no. 6, pp. 2064-2071, June 2018.
- Sandeep Raj and K. C. Ray, "A personalized arrhythmia monitoring platform", Scientific Reports (Nature), vol. 8, no. 11395, Jul. 2018, pp. 1-11.
- Sandeep Raj, and K. C. Ray, "An efficient method and point-of-care platform for real-time ECG monitoring", IEEE Transactions on Consumer Electronics, vol. 64, no. 4, Dec. 2018, pp. 452-460.
- Sandeep Raj, and K. C. Ray, "Automated recognition of cardiac arrhythmias using sparse decomposition over composite dictionary", Computer Methods Programs Biomed. (Elsevier), vol. 165, Oct. 2018, pp. 175-186.
- Sandeep Raj, K. C. Ray and O. Shankar, "Development of Robust, Fast and Efficient QRS Detector: A Methodological Review", Australas Phys Eng Sci Med. (Springer), vol. 41, no. 3, Sept. 2018, pp. 581-600.
- Sandeep Raj, K. C. Ray, "Sparse representation of ECG signals for automated recognition of cardiac arrhythmias", Expert System Appl. (Elsevier), vol. 105, Sept. 2018, pp. 49-64.
- Dheeraj Kumar Sinha, and Amitabh Chatterjee, "Spice Level Implementation of Physics of Filamentation in ESD Protection Devices" Microelectronics Reliability (Elsevier), Vol. 99, pp. 239-247, Dec 2017.
- Saurav Roy, Amitabh Chatterjee, Dheeraj Kumar Sinha, Rimma Pirogova and Srimanta Baishya, "2-D Analytical Modelling of Surface Potential and Threshold Voltage for Vertical Super-Thin Body Field Effect Transistor" IEEE Transactions on Electron Devices, Vol. 64, pp. 2106-2112, July 2017.

Areas of the Research

The Department of Electronics & Communication Engineering, IIIT Bhagalpur is aiming to lead the state of Bihar and India as a whole in the following areas:

Signal & Image Processing

The area of signal processing helps the students to learn, analyze and design the techniques that give core knowledge for DSP engineers. This course is well supported with high performance computers and Software packages such as MATLAB with Simulink and Code composer studio.

Microwave & Communication

The faculty of the department having specialization in communication focuses on training the students in both analog and digital transmission/reception of signals at GHz frequency range. Our students are trained for constructing the circuits for analog and digital modulations. The concepts of all type of modulation & demodulation, and recent communication techniques are demonstrated with available software and equipment. Microwave & Communication being a specialized branch involves teaching, research, and projects. The major areas of research involve simulation, analysis, design and development of microwave circuits, components and sub-systems including micro machined devices for RF, microwave, millimeter wave applications. Micro machined antennas, phase

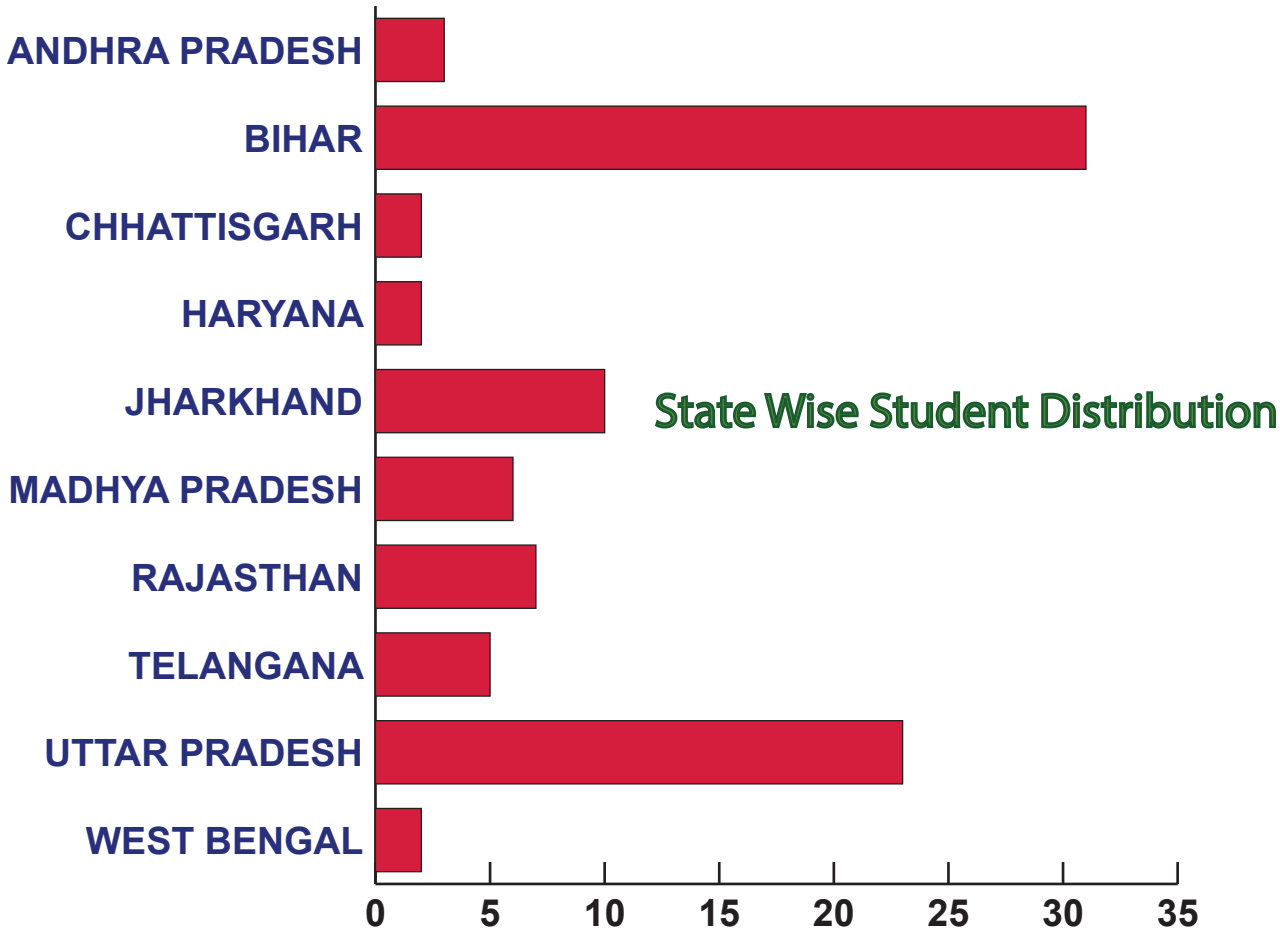
VLSI & Embedded Systems

Electronic world is going towards miniaturization, more features and Functionality, High speed, Low power consumption and Portable Size are the priority demand from the consumer side and are challenges for Electronic gadgets manufacturer. The technology because of which these demands and challenges have been fulfilled so far and are in a continuous process is known as VLSI. VLSI means Very Large Scale integration where researchers are working to incorporate large scale integration of electronic devices on a single silica chip "Integrated Circuit or IC to fulfil the market demand. The faculty members and students undertake various research works in all the areas of VLSI Design & Embedded Systems.

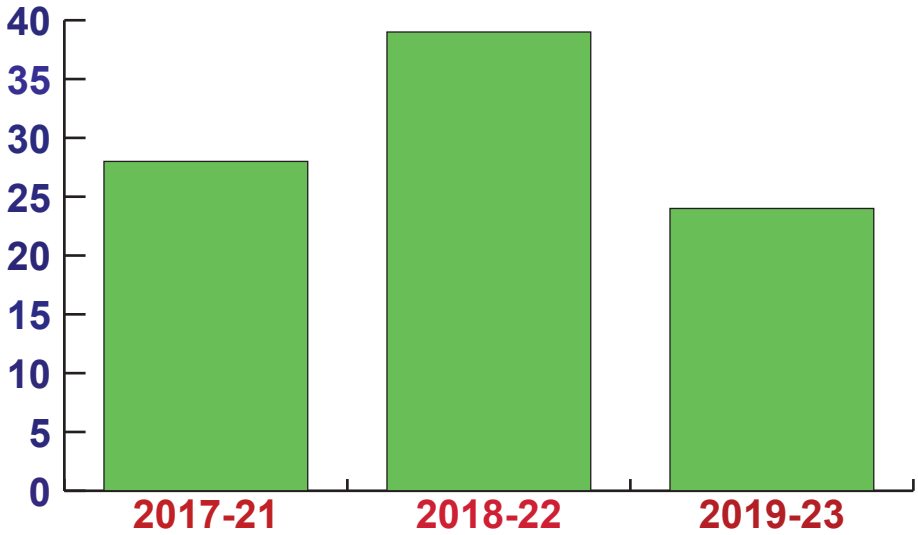
Computer Science and Engineering

The department has a meticulous curriculum on topics related to all aspects of computer hardware and software with an emphasis on practical learning. It provides an ideal environment to the students to think beyond the sphere and contribute through rigorous research.

Demography of the Department



State Wise Student Distribution



Batch Wise Student Distribution

CONTACT US

Head of the Department
Electronics & Communication Engineering
E-mail: hod.ece@iiitbh.ac.in
Phone No: +91-7632995205