



INDIAN INSTITUTE OF TECHNOLOGY, PATNA

DEPARTMENT OF ELECTRICAL ENGINEERING

**PLACEMENT BROCHURE
2020-2021**

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MESSAGE FROM HOD

The Department of Electrical Engineering at IIT Patna offers undergraduate programs that emphasize the fundamentals of electrical engineering and electronics technology to cater the needs of the world. Undergraduate curricula are offered that lead to Bachelor of Technology (B. Tech) degrees in electrical engineering. Department offers many advanced courses and have Master of Technology (MTech) in Communication System Engineering and the Doctor of Philosophy (Ph.D) in Electrical Engineering.

All faculty members are very renowned in their respective field of research and hold doctorates from reputed universities. Department has a Centre of Excellence in Teaching Learning Centre for Internet-of-Things (IoT), Smart Grid, and Smart Building sponsored by Department of Higher Education, Ministry of Human Resource Development (MHRD), Government of India. This centre has brought the department international recognition and provides unique opportunities for electrical engineering graduates and teachers of India to participate in learning the IoT related projects.

Students of the Department of Electrical Engineering are known throughout India for their enthusiastic participation in professional organisations and events. We regularly revise our curriculum according to the need of today's research and industry applications. The primary focus of our curriculum is to convey technical know-how to students, promote their problem solving skills and innovation of new technologies. We carry out collaborative and interdisciplinary research in various industries and research centres worldwide.

We have modern research and laboratory facility in the department. Our faculties have been conferred with many prestigious awards at national and international levels. We organise international symposia and conferences in the department. Our department looks forward to contribute in solving the technological challenges of the rural India with active participation from all sections of the society. The department takes pride in producing well rounded, professionally competent undergraduates and graduates.

DR. AHMAD ALI

HOD, ELECTRICAL ENGINEERING



ABOUT THE DEPARTMENT

Since the inception of the institution in 2008, the Department of Electrical engineering has been at the forefront of research and innovation, working on its primary objective of imparting quality education and training whilst leading on the innovation curve.

The department offers a comprehensive array of courses that encompass the undergraduate, postgraduate and doctoral levels. The department's reputed faculty brings their expertise to bear on a wide variety of areas in electronics and communication engineering, with emphasis on Communications, Advanced Digital Signal Processing, Biomedical and Speech Processing, Instrumentation and Control, VLSI, Image Processing and Computer Vision, Power System and Power Electronics. Laboratories for Basic Electronics, Analog Electronics and Digital Electronics, Communications, Digital Signal Processing, Embedded Systems, VLSI, Electrical Machines, Power Electronics and Power Systems are fully operational with advanced technologies, hardware equipments and necessary softwares. The Department has online access to IEEE Explore digital library, IEL, Science Direct, Springer and other online journals. High End Computational Servers and Software's like MATLAB, GAMS, CAD Tools and LabVIEW are available with the Department in order to accelerate the research. Department has a number of ongoing and approved projects worth 55 crore rupees under its umbrella.

The Electrical Engineering Department undertakes a continuous process of setting up experimental and computational facilities for taking up research & development and consultancy activities in various fields as also to produce state-of-the-art research output. In its brief but illustrious history, the EE Department of IIT Patna has already earned global recognition by its cutting edge R&D work. Research is nurtured both through academic programs run by the Department and through sponsored programs funded by national as well as international organizations and the industry.

COURSES OFFERED

SIGNAL PROCESSING

Signal and Systems forms one of the core areas at Electrical Department of IIT Patna. Faculty and students at IIT Patna are involved in various sponsored and non-sponsored interdisciplinary projects in domains such as circuit design, communication, seismology, biomedical engineering, energy generation and distribution, speech processing etc.

Courses Offered:

- Signal, System and Networks
- Digital signal processing
- Advanced digital signal processing
- Visual surveillance systems
- Advance Biomedical Signal Processing

Laboratories:

- Digital Signal Processing Laboratory

Sponsored Projects:

- Geospatial Location Estimation and Navigation in Autonomous Sensor Networks/Smart City
- Cyber-Physical Systems for M-Health

POWER SYSTEMS AND POWER ELECTRONICS

Power System and Power Electronics is one of the oldest division that is functional since the inception of the Electrical Engineering at IIT Patna. Students and Faculties are involved in various funded projects and coursework.

Courses Offered:

- Electrical Machines
- Power Systems
- Power Electronics and Drives
- Electrical Power System Operation and Control
- Distributed Energy Resources
- Electrical Machines Laboratory

Laboratory Facilities:

- Electrical Machines Laboratory
- Advanced Electrical Lab

Equipments:

- WIRELESS POWER TRANSFER: A Next Generation Power Transmission System
- Transmission line Simulator
- Fuel cell training system

CONTROL SYSTEMS

Control Systems is an important part of the Electrical Department. This field is aimed at imparting best education to students, which leads to cutting-edge research. There are motivated professors and students involved in this field working in areas like control of power system, control of relay-based networks, etc.

Courses Offered:

Control systems
Advanced control systems
Electrical power system operation and control

Laboratories:

Instrumentation and Control Laboratory

Projects:

Descriptor System: Modeling and Control in Infinite Dimension Space

COMMUNICATION ENGINEERING

Communication being a specialized branch involves teaching, research, and consultancy works. At IIT Patna, both faculty and graduate and undergraduate students are engaged in fundamental and applied research projects in Communication. These are being sponsored by various agencies like DST, MeitY, etc.

Courses Offered:

Principal of communication
Electromagnetic theory
Communication system
Optical Communication
Wireless Communication

Laboratories:

Communication Labaoratory
Optical Communication and Networking Laboratory
Signal Processing for wireless communication lab

Sponsored Projects:

Design of Blind Modulation Classification for MIMO-OFDM and MIMO-SC-FDMA System through FPGA Module and Testbed Implementation
Design and Analysis of High Performance RF MEMS-based Electronically Reconfigurable Filters for Wireless Communication Applications
Blind Symbol Timing Offset (STO) and Carrier Frequency Offset (CFO) Estimation and Implementation over OFDM, and MIMO-SC-FDMA testbed

VLSI & EMBEDDED DEVICES

Department of Electrical Engineering at IIT Patna is committed to provide high quality research and excellence in teaching. The faculty and students undertake various research work and projects in all areas of VLSI Design & Embedded Systems.

Courses Offered:

Semiconductor devices and circuits
Analog integrated circuits
Digital circuits and microprocessors
Introduction to VLSI design
Embedded systems
Electronics and instrumentation
Radio frequency integrated circuits
Digital VLSI Design
CMOS Modelling

Laboratories:

VLSI Design Laboratory
Embedded Systems Laboratory

Sponsored Projects:

Design and FPGA prototyping of multicarrier multiple access schemes for variable rate multimedia satellite communication
Design and Implementation of Novel VLSI Architectures of PRNG for Cryptography Applications

HSS AND OPEN ELECTIVES

Besides core courses, students are also offered many electives courses which ultimately helps in their allround development.

HSS Courses:

Communication Skills for Engineers, Introductory Microeconomics, Fundamentals of Linguistics Science, Introductory Sociology, Globalization and Social Change, Introductory Macroeconomics, Literature: Voices and Cultures, Language, Human Mind and Indian Society, Cognition language and computation, , Health Care Management, Financial Economics, Diasporic Literature, Sociology of Development, Fundamentals of Cognitive Science, Industrial and Organizational Psychology

Open Electives:

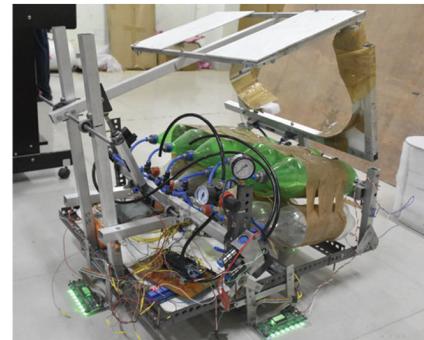
Optics & Lasers, Vacuum Science and Techniques, Introduction to Nanomaterials, Solid State Devices, Photovoltaic's & Fuel Cell Technology, Green Chemistry and Technology, Introduction to Computational Topology, Entrepreneurship, Industrial Waste Treatment and Management

STUDENT ACTIVITIES

Technical

DD India Robocon

In DD India Robocon 2019 robocon team of IIT Patna, having majority members from Electrical Department, came 2nd in Stage 1 among all the participating institutes and, came 24th in Stage 2

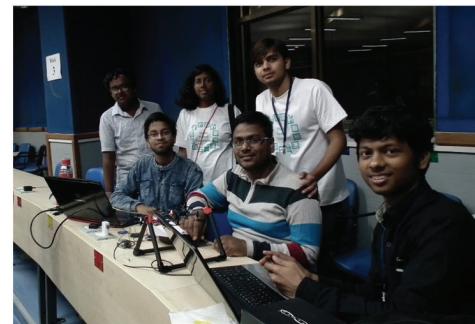


Competitive Coding

Electrical branch has a large number of competitive coders. One of them also represented IIT Patna at ACM-ICPC world finals along with his team in 2018 and 2019. Current placement season host students having rating of 2000+ in codeforces and codechef

Inter IIT Tech Meet

Many students take part in the Inter IIT Tech meet which is held each year and showcase their talent ranging from efficient circuit design to deploying innovative machine learning algorithms. Our branch students bagged gold medal in Ashoka Tech for Change Challenge at Inter IIT Tech meet 8.0



GSOC

Students from our department actively participate in Google Summer of Code and are involved in various projects



IEEE Student Branch

IEEE Student Branch of IIT Patna was established to develop and promote professional identity in IEEE's designated fields of interests: Sciences, Technology, Engineering and Mathematics (STEM) in IIT Patna. As a part of it, workshops, seminars and other events are conducted regularly to make students aware of technical achievements in the fields of STEM and encourage them to pursue a career in those fields.

Club Activities

Sparkonics is an association of the students motivated to learn, create and teach the basics of electronics, explore the upcoming technology and implement them through mini projects. The club also conducts events, classes and meetings for the department. With the guidance and help of the professors of the department, the club provides students a platform and resources to gain practical



Entrepreneurial

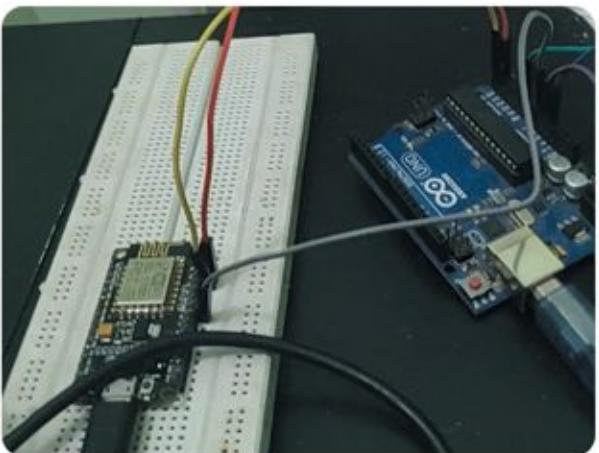
Students from our department are involved in organizing various workshops and in competitions held by the E-cell IIT Patna. Some students are also involved in establishing a startup.

Social

Under the name of Prayatna, students of IIT Patna try to give continuous quality education to underprivileged children. The Core team, which looks after the administration part, consists of 3 electrical undergraduate students.



Student Projects



RISC-V 32IM Microcontroller Development

IOT based Air Conditioner Controller

The project deals with designing various modules related to SPI Interface for a RISC-V 32IM core. The modules were verified on a Xilinx Boards with external PMOD Flash

This is a smart device for controlling the temperature of our college server to protect from overheating. Arduino and Node MCU were used to design the controller and an app that captured data from device using Google Firebase

8 bit retro CPU from scratch

This is 8 bit CPU from 74 series logic ICs , which is comparable to early 80's era CPU performance

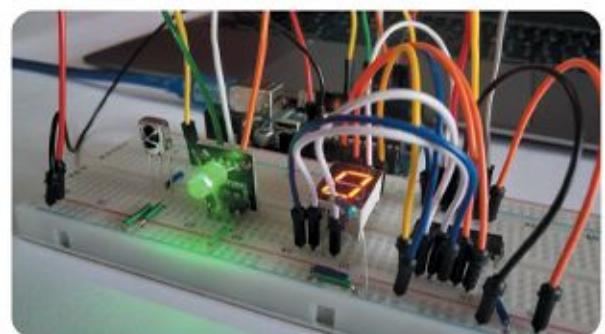
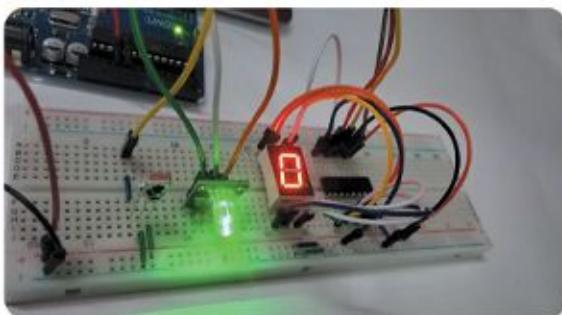
Quadcopter drone from scratch

It is an Arduino based PID controlled quadcopter drone. It includes sensors like gyroscopes, accelerometer, altimeter etc..



8 bit Reed Solomon Encoder and Decoder

The project involves the hardware implementation of a 8 bit (255,249) Reed Solomon Encoder & Decoder. It includes the implementation of the multiplier, divider, encoder, syndrome, error polynomial evaluation, Chien Search Blocks. The verification was done by implementing the same algorithm in MATLAB and with a randomly generated sequence of symbols in Python which was finally matched with the verification waveform in Vivado.



IR remote lock system

It is an IR remote controlled password lock system using VS1838b infrared receiver module and Arduino Uno. Inputs given through remote are decoded by Arduino, and matched with password. If input matches, system is "unlocked" and reset button is pressed for locking it again.

INTERNSHIPS



Research



PAST RECRUITERS



<CODE_NATION>



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