INDIAN INSTITUTE OF TECHNOLOGY PATNA

# Placement Brochure 2016 - 17

Department of Electrical Engineering

# Message from the Head of the Department

Dr. Ranjan K Behera

HOD, Department of EE

IIT Patna

Department of Electrical Engineering has started in 2008 and since last year the department grown to the top level of core research and teaching. We have strong undergraduate program B. Tech., and post graduate programs like M. Tech and PhD in various specialization of electrical engineering. We revise our curriculum according to the need of today's research and industry applications. Hence the teaching is focused on fundamental principles of engineering 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. Department offers large number of optional courses so that our undergraduate students are encouraged to undertake various research projects.We carry out collaborative and interdisciplinary research in various industries and research centers worldwide. We have modern research and laboratory facility to cater the needs of young faculty members.

Our department has a distinguished record in both teaching and research. Faculty members have excellent academic credentials and are highly regarded. They have been conferred with many prestigious awards at national and international levels. Several faculty members serve on the editorial boards of national and international journals, review technical articles for journals on a regular basis, and organize international symposia and conferences.

Our electrical engineering departmental website provides an overview of the academic programs, research activities of our department, research facilities, profiles of faculty members, and details of student activities.Our department looks forward to contribute in solving the technological challenges of the society with active participation from all sections of th e society.
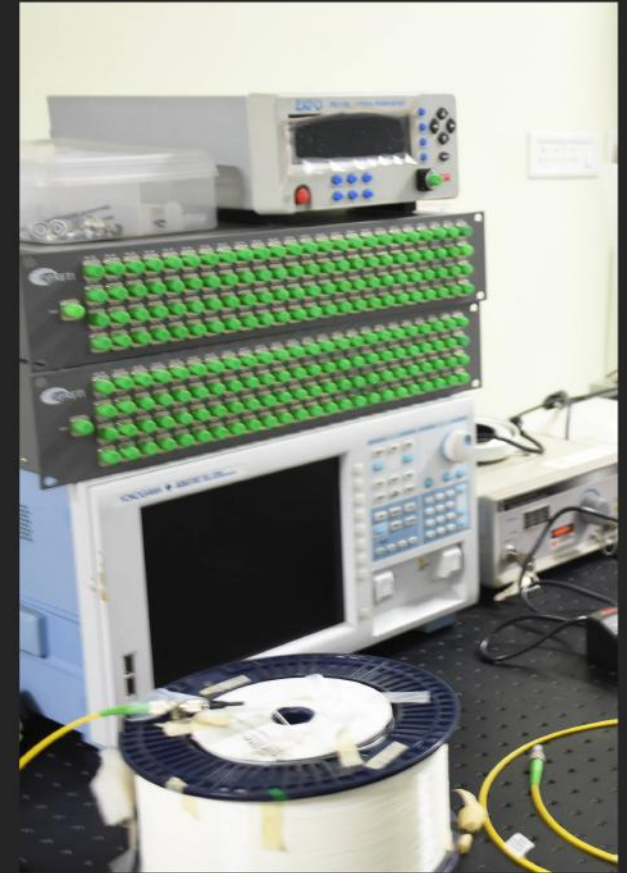
# Contents

# About the Department

The Department of Electrical Engineering (EE) has been evolving since the inception of IIT Patna in the year 2008. The major objective of the department is to impart high quality education and to encourage the students, comprising B. Tech, M. Tech and PhD, in pursuing research. The department offers B. Tech in Electrical Engineering, M. Tech (Communication System Engineering) and Ph.D. program in various specialized areas of Electrical Engineering.

The department is committed to engage in high quality research and pursuit of excellence in teaching. The faculty members of the department are actively involved in research and development in challenging areas of both theory and experiment. The labs established here have been well equipped with the latest equipment.

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 are available with the Department in order to accelerate the research. Instructional as well as Advanced laboratories like Communication, Digital Signal Processing, Embedded Systems, VLSI, Electrical Machines, Power Electronics and Power Systems are also fully operational with advanced technologies, hardware equipments and software.

Department has a number of ongoing/approved projects of total amount 55.0 Crore. The 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.
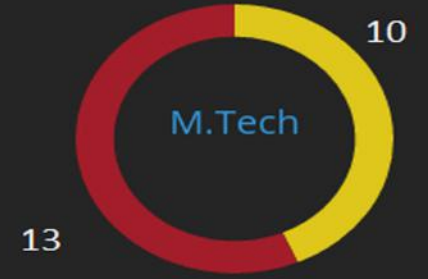
# Academic Programmes

1. BACHELOR OF TECHNOLOGY | B.Tech

2. MASTER OF TECHNOLOGY | M.Tech

3. DOCTOR OF PHILOSOPHY | PhD

**B.Tech**

42    44

- ■ B.Tech - Junior Year
- ■ B.Tech Senior Year

**M.Tech**

10

13

- ■ M.Tech - First Year
- ■ M.Tech - Second Year

# Courses offered

## DEVICES

Semiconductor Devices and Circuits

Analog Integrated Circuits

Digital Circuits and Microprocessor

Introduction to VLSI Design

Embedded Systems

Electronics Instrumentation

Radio Frequency Integrated Circuits*

## SIGNAL PROCESSING

Signals and Systems

Digital Signal Processing

Advance Digital Signal Processing*

Visual Surveillance Systems*

## POWER AND CONTROL

Electrical Sciences

Electrical Machines

Electrical Power Systems

Control Systems

Advanced Control Systems

Electrical Power System Operation and Control

Power Electronics and Drives

## COMMUNICATION

Principal of Communication

Electromagnetic Theory

Communication System*

Optical Networks*

## MATHEMATICS AND COMPUTING

Introduction to Computing- C

OOPS and Data Structures

Probability Theory and Random Processes

Number Theory and Calculus

Linear algebra and Real Analysis

Differential Equations

Complex Analysis and Fourier Series

Mathematical Methods in EE

Optimization Techniques*

Introduction to Numerical methods*

Computational Topology*

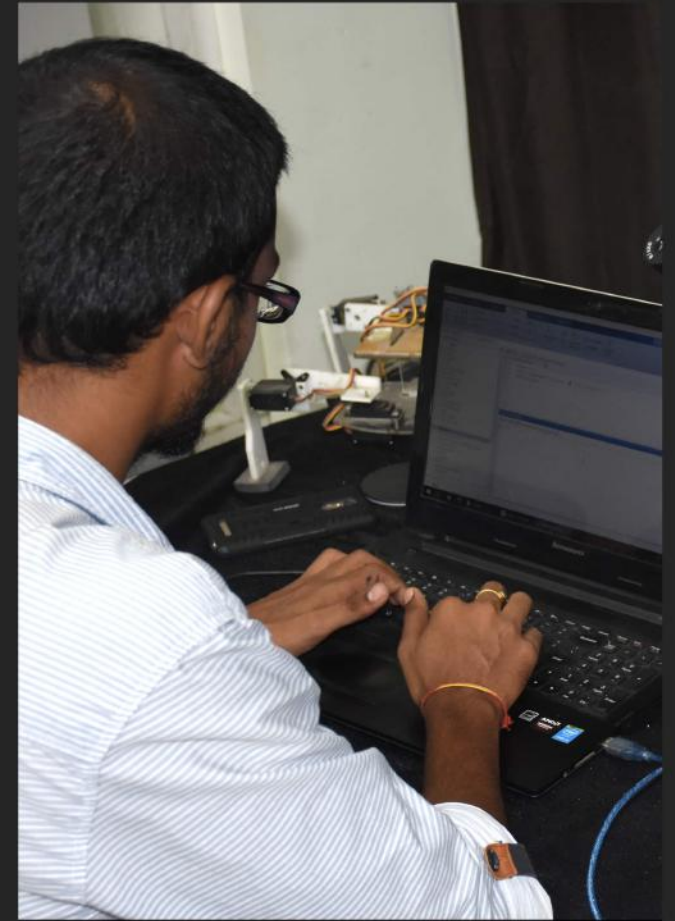Number Theory and Cryptography*

Elective Course *

# Research and Development

In addition to all the theoretical and practical courses, the undergraduate and graduate students actively contribute to the ongoing research in the department. Every student of B.Tech and M.Tech has to mandatorily complete a research project in their ultimate and penultimate semesters. There is also a compulsory design project (Hardware project) for B.Tech students in their sixth semester. The research activities in the department are broadly carried out under the following five groups:
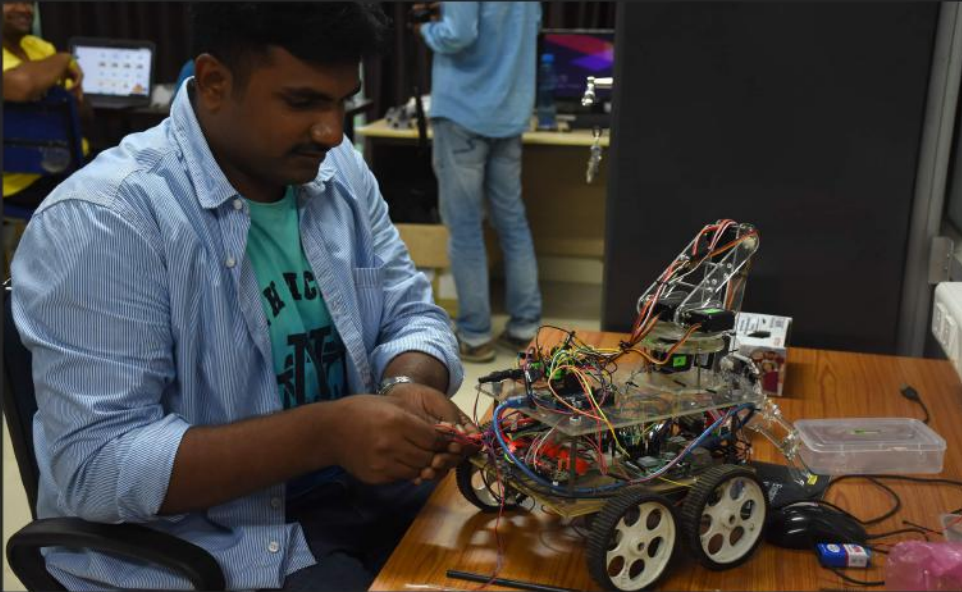
1. Image Processing and Computer Vision

2. VLSI and Embedded Systems

3. Power System and Power Electronics

4. Communication and Advanced DSP

5. Control and Instrumentation

In addition to these, the department also executes various research projects sponsored by noted institutions like Department of Science and technology, DRDO, Ministry of Information Technology, DeitY to name a few. A few of the projects sponsored :

1. Integrated Automatic Voltage Control of a High Efficient Solar PV System
2. Design and FPGA Prototyping of Multi Career Multiple Access Schemes for Variable Rate Multimedia Satellite Communication
3. Design and Analysis of High Performance RF MEMS-based Electronically Reconfigurable Filters for Wireless Communication Applications
4. National Mission for Power Electronics Technology (NaMPET) Project by Ministry of Communications and Information Technology, Govt. of India.
5. Analytical investigation of sub-threshold behavior of SiNT FETs
6. Integration of Distributed Energy Resources to enhance the reliability of the system

# Student Activities and Participation



## CELESTA

IIT Patna each year celebrates its Technical Fest, christened as 'CELESTA'. The department club organise various events such as static rush , decode, electro-quizite etc. to inculcate interest in young minds to pursue technology and make it their passion.

## PROJECTS

Speech Processing : Identification of Voicing assimilation in children's speech using dynamic time warping on numerous speech features

Detection of Forgeries in Multi Spectral Images using EM and BTES algorithms

Fire Escape Routing using Learning Models

AES encryption and decryption using FGPA

Analysis of dynamic passcode based authentication method

Egocentric Vision

Underlay Device to Device Communication

Object Classifier (SURF and HOG Features) and Tracker Bot using FPGA Based NI MyRio.

# Student Activities and Participation

## IEEE STUDENT BRANCH IIT PATNA

IEEE student branch of IIT Patna opened with a group of students enrolled in various M.Tech and PhD Courses with a view to promote technical activities in the campus, city and the state of Bihar. Now with the involvement of B.Tech students too, the branch organizes yearly lectures, IEEE programs and conferences.

## CONFERENCES AND WORKSHOPS

In order to provide exposure to the students about the recents developments, conferences and workshops are being organized :
Fifth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG) 2015
IEEE International Symposium on 5G
FPGA Based System Design – A short term course

# Student Activities and Participation

## STUDENT ACHIEVEMENTS

Semifinalist in Cisco Ideate for project "Smart water metering"

Inter IIT Tech meet : Bronze medal for "Internet of Things", Rank 4 for "Hardware modeling"

Runner up in Pune Smart City Hackathon

UG student attended Harvard Project for Asian and International Relations Conference at Manila, Philippines under Energy and Sustainability Panel.

Model based on "Smart transportation theme" was selected among top 10 contestants for Make In India Hackathon- IIT Bombay

## PROJECTS

Free Space optical communication: LiFi

Bicycle locking system design with IR transceivers

Embedded Heart beat pulse counter

Device to device underwater communication

Smart Home automation

Baggage detector with machine learning approach

Specialized and efficient Buck- Boost converter for solar driven auto-rickshaw

# Internships

Students pursue a summer internship of 8-10 weeks after their third year in corporate industries and academic institutions where they apply the theoretical classroom gained knowledge into solving real world problems. These internships provide the students with an immense amount of exposure making them ready to enter the professional world.



## Research Internships

- Indiana University

- NTU, Singapore

- IIT Kanpur

- Central Electronics Engineering
  Research Institute, Pilani

- IIIT Delhi

## Industrial Internships

- Robert Bosch Engineering and Business
  Solutions

- Cisco Systems

- NTPC

- NHAI

- BSNL

- DRDO

- ECIL

# Past Recruiters

# Past Recruiters

# Contacts

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**Department of Electrical Engineering:**

www.iitp.ac.in/index.php/departments/engineering/electrical-engineering.html

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