An Overview of IIT Patna

Asif Ekbal

Associate Professor

Dept. of Computer Sc. & Engineering

&

Associate Dean

Research and Development

IIT Patna *(since 2008; 6th August)*

IIT system

- Indian Institutes of Technology were created with an Act of Parliament called the "Institutes of Technology Act", 1961
  - 5 IITs: Kharagpur, Bombay, Madras, Kanpur, Delh
  - 2 more: IIT Guwhati, IIT Roorkee
  - All institutes of national importance
- Amendment 2011: 8 new IITs + IIT BHU
  - Patna, Bhubaneshwar, Hyderabad, Gandhinagar, Jodhpur, Mandi, Indore, Ropar
- Amendment 2016: 6 additional IITs + IIT-ISM Dhanbad
  - Palakkad, Tirupati, Goa, Jammu, Darwar, Bhilai

Institutes of National Importance

- Striving for excellence
- Strict quality control
- Transparency of processes
- Rule governed operations

Only the best get in!!!

Indian Institute of Technology Patna

IIT Patna: Perspective-great tradition

- Mighty Mourya Dynasty and Magadh Empire
- Mighty Rulers: Ashoka and Chandragupta
- Mighty Intellectuals: ChaNakya, Aryabhatta,

  Dr. Rajendra Prasad (*first President of India*)
- Nalanda University- the oldest university in the world

Lights of Humanity- Buddha, Mahavir, Guru Govind Singh !!!

आई आई टी पटना

वश्विव का मुकुटमणि आई आई टी पटना
सदा तत्पर सदा जाग्रत पीछे ना जाने हटना ।।

दो हजार आठ छह अगस्त को
जग ने कहा, "जी बधाई हो
शक्षिा नभ का ध्रुव तारा आई आई टी पटना "।।

**नालंदा, वक्रिमशलिा
जसि धरती की रही माला
उस बहिार का और एक सुमन आई आई
टी पटना।।**

**चाणक्याशोक, चंद्रगुप्त
महावीर और तथागत
आर्यभट्ट आशीष धन्य आई आई टी
पटना ।।**

वज्ञािनं, तकनकिी
अंकशास्त्र, मानवकिी
सर्व शास्त्र पारंगत आई आई टी पटना।।

हम ने ले ली यह प्रतज्ञिा
ईश्वर की भी यही आज्ञा
होगा चरम प्रतष्ठिा पर आई आई टी पटना
सदा तत्पर सदा जाग्रत पीछे ना जाने हटना
वश्विव का मुकुटमणि आई आई टी पटना ।।

-पुष्पक भट्टाचार्य्य

IIT Patna

Jewel in world's crown is IIT Patna
Ever active ever awake, knows never to step
    back||

Two thousand eight sixth august
World said, "heartiest congrats
New star in education's sky- IIT Patna"||

Nalanda, Vikramshila

Land of Bihar they adorn

**Has another flower bloomed- IIT
    Patna**||

**ChaaNakya, Ashok,
    Chandragupt**

By Mahavir Tathagat

**By Aryabhatta is blessed
    IIT Patna**||

Science and Technology
Mathematics, Humantities
Cultivated in all discipline is IIT
    Patna||

This promise we do make
Lord God too wills alike
On glory's peak will be IIT Patna
Ever active ever awake, knows never to step back
Jewel in world's crown is IIT Patna||

-Pushpak Bhattacharyya

Board of Governors

Mr. Ajai Chowdhry **Founder, HCL**	**Chairman**
Prof. Pushpak Bhattacharyya **Director, IIT Patna**	Ex-Officio Member
Principal Secretary **Department of Science & Technology, Government of Bihar**	Member
Principal Secretary **Department of Science & Technology, Government of Jharkhand**	Member
Prof. Amitabha Ghosh **Former Director, IIT Kharagpur**	Member
Prof. Sriman Kumar Bhattacharya **Former Director,Central Building Research Institute, Roorkee**	Member
Prof. Ajay Chakrabarty **Former Vice-Chancellor, BIT Mesra**	Member
Dr. T. Mukherjee **Former Deputy Managing Director,Tata Steel, Jamshedpur**	Member

IITP permanent campus

- New permanent
- 500 acre Land at Bihta
- 25-30 KM away from the main city Patna
- Inaugurated by Hon'ble Prime Minister of India on 25th July, 2015
- Nearest Railway station Bihta 3KM
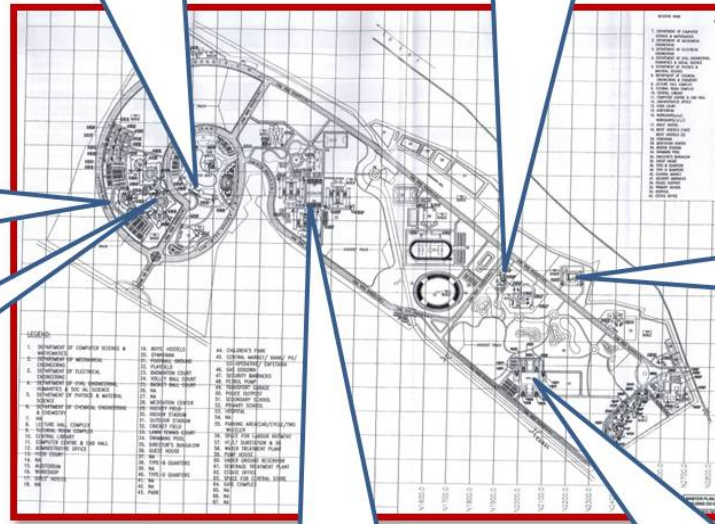- Nearest airport is at Patna (35 KM)

Main Campus: Coordinates

Administrative Building

Director's Bungalow

Tutorial Complex

Hospital

Academic Blocks

Boys' Hostel
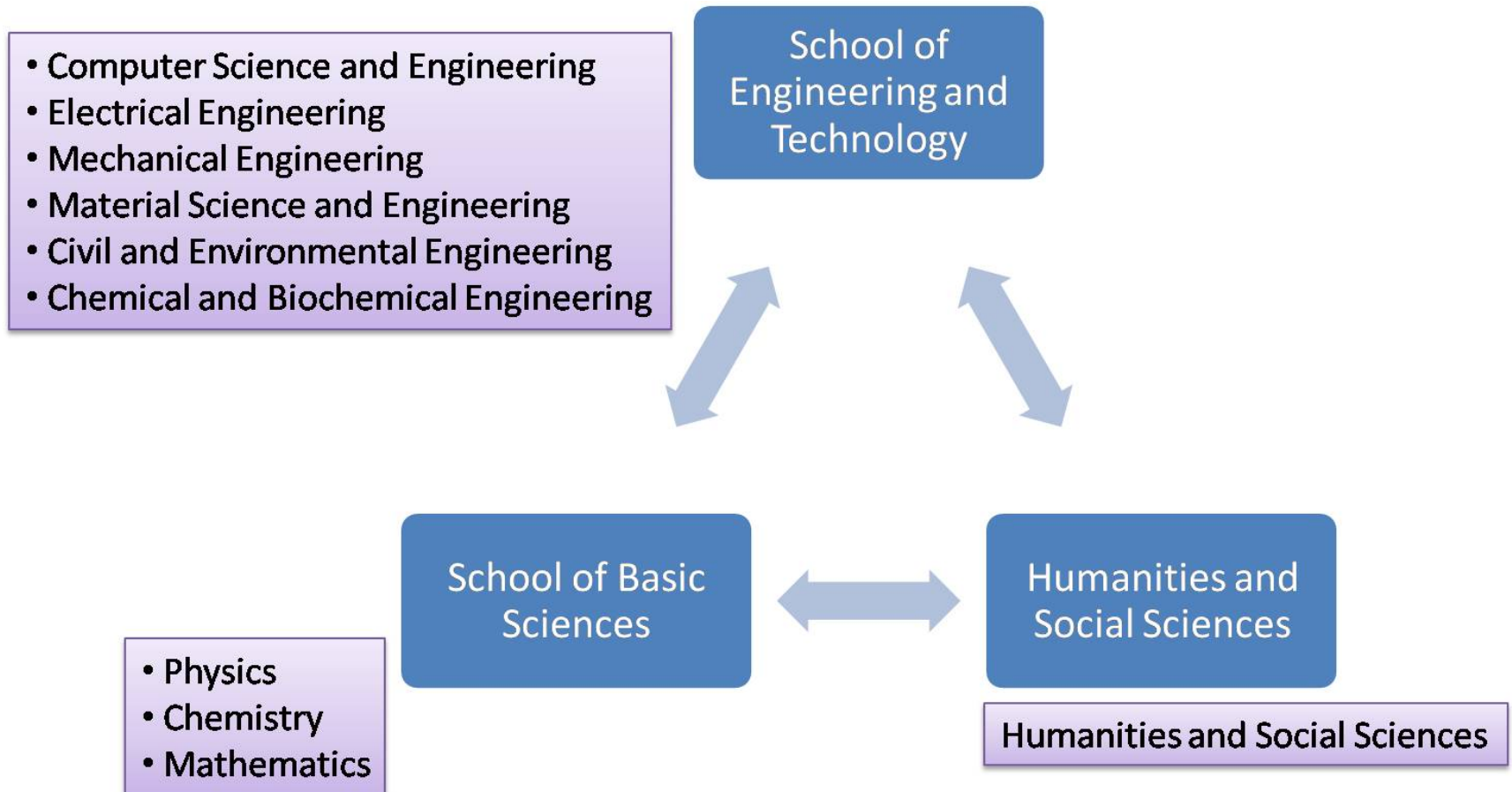
Faculty Quarter &
Girls' Hostel

Academic structure

- Computer Science and Engineering
- Electrical Engineering
- Mechanical Engineering
- Material Science and Engineering
- Civil and Environmental Engineering
- Chemical and Biochemical Engineering

School of Engineering and Technology

School of Basic Sciences

Humanities and Social Sciences

- Physics
- Chemistry
- Mathematics

Humanities and Social Sciences

Academic programs

Academic Programmes

B. Tech.
- Computer Science & Engineering
- Electrical Engineering
- Mechanical Engineering
- Civil & Environmental Engineering
- Chemical & Biochemical Engineering

M. Tech.
- Mechatronics
- Mathematics & Computing
- Nanoscience & Technology
- Computer Science & Engineering
- Communication System Engineering
- Mechanical Engineering
- Civil & Environmental Engineering
- Material Science & Engineering
- VLSI & Embedded Systems

M.Sc.
- Mathematics
- Chemistry
- Physics

Ph.D.
- In all major disciplines of Engineering, Sciences, Humanities and Social Sciences as well as some inter disciplinary areas.

Energy of the institute

Recent activities

Numbers, numbers...

- 745 B.Tech students, 152 M. Tech, 23 M.Sc. students and 332 Ph.D students

- 115 faculty members

- 88 staff members

Publications, projects…(last year)

- ~330 research papers
- Participations in ~280 conferences over the last one year
- More than 150 papers in Scopus listed journals
- 34 new projects worth more than Rs. 15 Crores (23000535.00 USD) sanctioned
- 18 consultancy projects worth Rs 2.35 Crores (3603417.15 USD)
- Funding from DEITY, ISRO, SERB, SERB (DST), CSIR, DST, REIPL, ASPL, TIFAC, VBP, BUIDCLP, and MHRD, MWR, Indo-Russia among others

Facilities

Computational resources

- 2 central labs with 160 desktops
- Available from 9:00 AM to 2:00 AM

- 12 High-End UNIX based servers

Central Labs

High end Servers

Faculty Support

Network Services

- Personal Desktops or Laptops
- Individual Multifunction Printers

- Mailing System
- Web Services
- Storage
- Video Conferencing

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Laboratories

- Nuclear Magnetic Resonance spectrometer, X-ray diffraction machine, Single crystal XRD, Field Emission Scanning Electron Microscope, atomic Force Microscope, Raman Spectrometer, and Computer Integrated Manufacturing Machine to name a few.

- Sophisticated Analytical Instrumentation Facility (SAIF)

  - High Resolution Liquid chromatograph–mass spectrometer (HR-LCMS) and

  - Single Crystal X-Ray Diffractometer (SC-XRD).

Library

- Total number of books (in hard copy) till date: Approximately 17,363

- e-books from different publishers like Wiley, Springer, Pearson, McGraw Hill, CRC Press, ACS, World Scientific etc.

- Subscription of online journals of Elsevier, Wiley, Springer, Taylor & Francis, IOP, ProQuest, ASME, ASCE, AIP. APS, IEEE, OSA, OUP, SPIE, SAGE, Science, Nature, PNAS, and so on

- Online database like SCOPUS, Scival, SciFinder, MathSciNet, Web of Science etc.

Entrepreneurship

- **Incubation Center (IC) on Medical Electronics**
  - MeitY (Rs 22.10 crore) and Government of Bihar (Rs.25 crore) = 7.3 million USD (approximately)
- **Technology Business Incubator (TBI)**
  - ~13 Cr (19933511.00 USD from DST, Govt. of India)
  - *Foundation for Innovators in Science and Technology*

Incubatees

- **Bionic Hope Pvt Ltd:** product called active upper limb prosthesis with a sense of touch, which has technology that has been filed for patent

- **4Mirror Technologies** is working on patient monitoring systems

- **MEDEIT:** working on a product in the area of early cataract detection

Collaboration: Institutions & Industries

- MoUs with several institutions (*total-12*)
  - IST Lisbon, WSU, NTU, University of Houston, USA etc.
- Work closely with other IITS and Indian universities
- Accenture, Elsevier, ezDI, Tektronics, LG, Bosch
- *Joint masters (M.Tech) between WSU, USA and IITP (Computer Sc. & Engg.)*

Research Projects and Centres
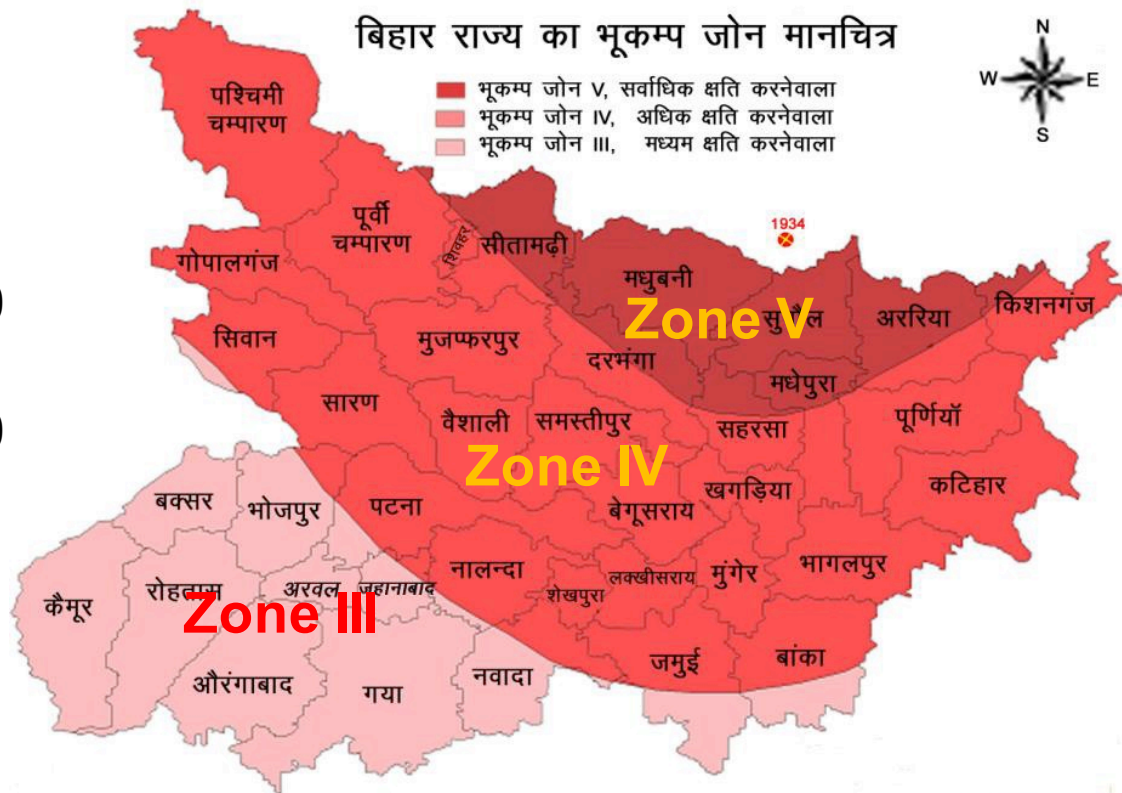
Internet of Things

- Pandit Madan Mohan Malviya National Mission on Teachers and Teaching (PMMMNMTT) for Internet-of-Things

- IIT Patna: lead institute of TLC (Teaching-Learning Centre) project value of Rs. 753.6 Lakh

AI, NLP, ML

- Centre of Excellence for Natural Language Processing, Elsevier

- Accenture Artificial Intelligence Lab

- Shusrut: ezDI Research Lab on Health Informatics

Upcoming-Centre for Earthquake Engineering Research

- More than 70% area lie under high earthquake zone
- Past Earthquake in Bihar
  - 1934 – M8.0, about 8000 people died
  - 1988 – M6.6, about 1000 people died
- Recent 2015 Nepal Eq – M7.8, huge loss of life and property in Nepal
- **Bihar was Lucky!!!**

बिहार राज्य का भूकम्प जोन मानचित्र

■ भूकम्प जोन V, सर्वाधिक क्षति करनेवाला
■ भूकम्प जोन IV, अधिक क्षति करनेवाला
■ भूकम्प जोन III, मध्यम क्षति करनेवाला

Zone V
Zone IV
Zone III

Upcoming: Centre for Endangered Language Studies

- Language endangerment – cultural erosion
- 42 endangered languages spoken in Odisha, Jharkhand, Bihar and West Bengal. Endangered languages from Bihar:
- Angika   (North Eastern districts of Bihar)
- Bajjika   (North- Central Bihar)
- Bhojpuri   (Western Bihar)
- Kudmali   (South Eastern Bihar)
- Magahi   (Southern Bihar)
- Maithili   (Northern Bihar)
- Majhi   (Eastern Bihar)
- Musasa   (Eastern Bihar)
- Sadri   (scattered)
- Surjapuri   (North Eastern Bihar)

IMPRINT (MHRD + other Ministry

- Cross-Lingual and Multi-Lingual Event Monitoring in Indian Languages (Rs. 3.75 cr), Speech Based Patient-Assisted System (Rs. 2.73 cr) and Micro Power Grids (Rs. 2.07 cr)

- Jointly with IIT Bombay, IIT Madras, IIT Kharagpur, IIT Guwahati and AIIMS, New Delhi.

Sponsored Projects & Consultancies

- Sponsored projects & consultancies: *113 Crores (173 million USD)- since 2008*

- Currently running projects and consultancies: *132*

Conferences and workshops

- 8 GIAN courses (**G**lobal **I**nitiative for **A**cademic **N**etwork)
- Symposium on modelling and Computation
- Conference on William Shakespeare
- Conclave on "Social Entrepreneurship, Youth Leadership & Careers in the 21st Century"
- Workshop on Fluid Mechanics: Modeling, Analysis & Computation
- 6[th]International Symposium on Embedded Computing & System Design (ISED)
- 15th Asian Conference on Solid State Ionics (ACSSI-2016)

GIAN Courses (1/2)

Course Name	**Reliability Engineering and Fault Tolerant Computing**
Foreign Faculty :	Prof. Adit D. Singh
Duration :	09.01.2017 to 13.01.2017
Course Name	**Multiobjective Optimization**
Foreign Faculty :	Prof. Carlos A. Coello Coello, Mexico
Duration :	15-12-2016 to 22-12-2016
Course Name	**Internet of Things (IoT) Security: Issues, Innovations, and Interplays**
Foreign Faculty :	Prof Swarup Bhunia
Duration :	12-12-2016 to 16-12-2016

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Symposium on Modelling and Simulation

GIAN (2/2)

Course Name	**Number Systems for Digital Signal Processing**
Foreign Faculty :	Prof. Benjamin Premkumar
Duration :	17.10.2016 to 23.10.2016
Course Name	**Hierarchical Computational Methods for Cross-disciplinary Multiscale Dynamics**
Foreign Faculty :	Ganesh Balasubramanian, United States of America
Duration :	14-10-2016 to 22-10-2016
Course Name	**Modeling approaches of Nanoscale filtration processes of solutions and Suspensions**
Foreign Faculty :	Professor Anatoly Nikolaevich Filippov, Russia
Duration :	13-07-2016 to 20-07-2016

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GIAN Courses: To be offered

- 10 (*approx.*) new courses will be offered by professors from abroad

- Topics: Big Social Data Analysis, Machine Learning for IoT, Cyber Security, Monotone Iterative Techniques, Mathematical Framework of Sequence Design for Wireless Communication Systems, Neural Machine Translation etc.

Student Life

Student Activities

- Anwesha: Techno-Cultural Festival (January every year)
- Infinito (inter-collegiate sports)
- Inter-IIT
- Entrepreneurship week
- National Social Service (NSS) units
- Unnat Bharat Abhiyan
- Swacch Bharat Abhiyan
- Sarv Siksha Abhiyan
- Research Scholars Day
- National Science Day
- Nobel Lectures day

TEDX IIT Patna

Ashok Krish
Head of Social Media & Workplace
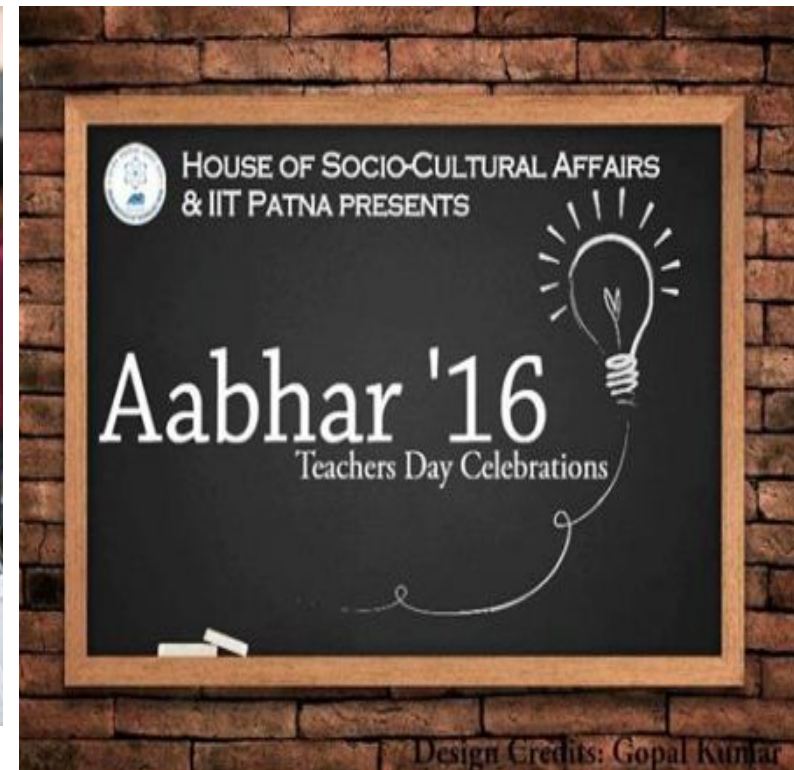Reimagination PracticeTCS Digital Enterprise
at Tata Consultancy Services

Dr. George Puthuran
Doctor, Ophthalmologist

Dr. Mohan Kameswaran
Doctor,
Otorhinolaryngologist

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Teachers day (best teacher lectures): Sep 05 (every year)

Gandhi Jayanti (2nd October, Birth anniversary of Mahatma Gandhi)

Anwesha

Virasat: SPIC MACAY

Awards and Distinctions for Faculty

- Fellow of National Academy of Engineering
- NASI Scopus Young Scientist
- Eminent Engineer Awardee, Institute of Engineers
- Visvesvaraya Young Faculty Grant
- Humboltdz Fellowship, JSPS Fellowships
- Research reported in MIT Tech. Review, London Times etc.

Student Laurels

- ## Best paper awards:
  - ICRCS 2017
  - Symhealth 2017
  - 5th International conference on Energy Engineering and Environmental Engineering
  - 6th International
  - 43rd National Conference on Fluid Mechanics and Fluid Power(FMFP2016), ICFM 2016

- Adobe Research Women-In-Technology Scholarship award for year 2017

- IIT Patna's Team Alacrity: 3rd position in ASME HPVC (Human Powered vehicle Challenge) Asia Pacific 2017

- Google Travel Support, Microsoft Travel Support, Google NLP Summit, Zurich

Training and Placement

- A total of 46 companies visited IIT Patna in 2016-17
- Selected 112 undergraduates and 28 post graduates/Ph.D
- Highest package of INR 36 lakh/annum (55011.42 USD) was offered by M/s Works Apps

- Majority M.Tech students pursue higher studies
- Ph.Ds recruited as faculty members in reputed national institutes and companies, post- doctoral fellowship in prestigious universities in India and abroad

Branch Wise B.Tech Placement (CPI≥7)(in Percentage)-2016-17
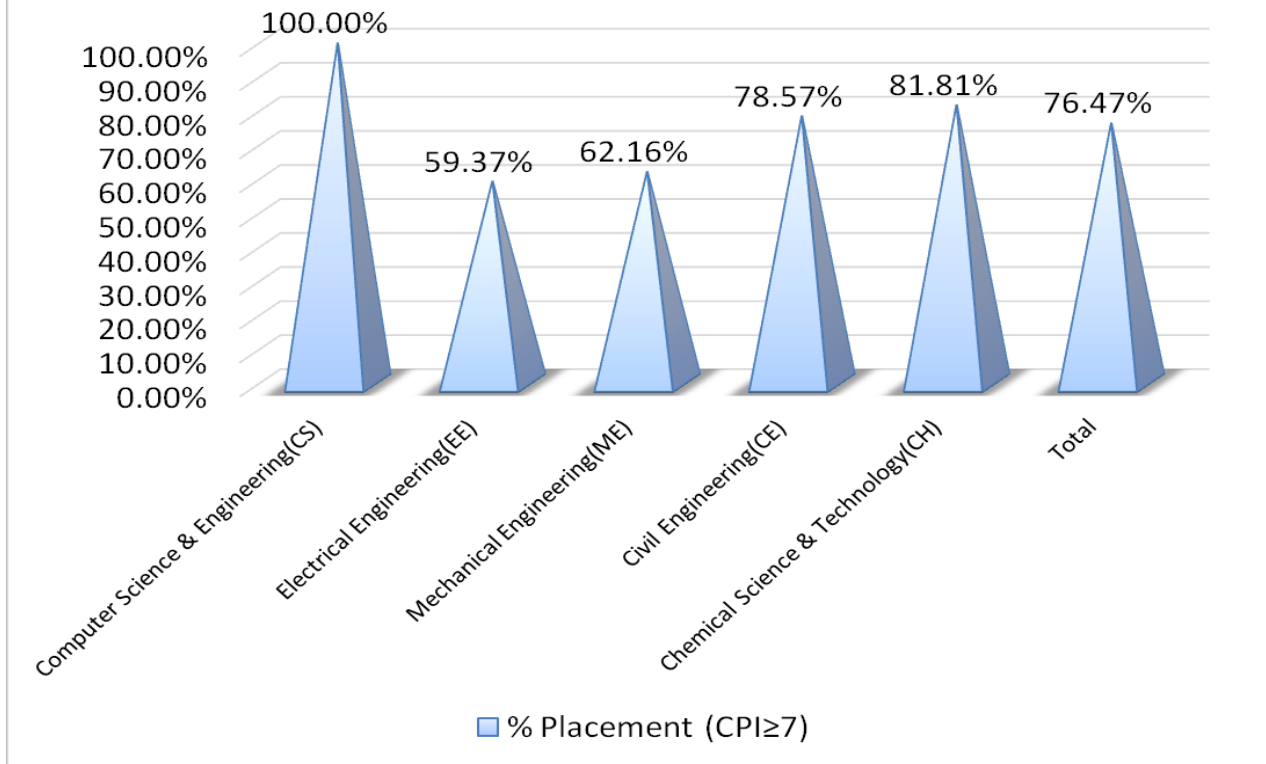
Possible ways to collaborate

- Joint Projects
- Joint PhD/Masters Programmes (like we did with *WSU, USA*)
- Faculty exchanges
- Student exchanges
- Summer internships
- Joint PhD guidance
- Establishing Research centres in cutting edge areas

Thank You very much for Your Attention !!