

# Opportunities in a New IIT

Pushpak Bhattacharyya  
Director,  
IIT Patna

Talk at Georgia Tech, 21<sup>st</sup> July, 2017

# IIT Patna (*since 2008; 6<sup>th</sup> 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, Delhi
  - All institutes of national importance
- Amendment 2011: 8 new IITs + IIT BHU
  - Patna, Bhubaneswar, 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)

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

# आई आई टी पटना

विश्व 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  
शिक्षा नभ का ध्रुव तारा आई आई टी पटना "।।

नालंदा, विक्रमशिला  
जिस धरती की रही माला  
उस बिहार का और एक सुमन आई  
आई टी पटना ।।

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

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

विज्ञानं, तकनिकी  
अंकशास्त्र, मानविकी  
सर्व शास्त्र पारंगत आई आई टी पटना।।

-पुष्पक भट्टाचार्य

# 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 | |**

**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 | |**

**Chaanakya, Ashok,  
Chandragupt  
By Mahavir Tathagat  
By Aryabhata is blessed  
IIT Patna | |**

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

**-Pushpak Bhattacharyya**

# 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

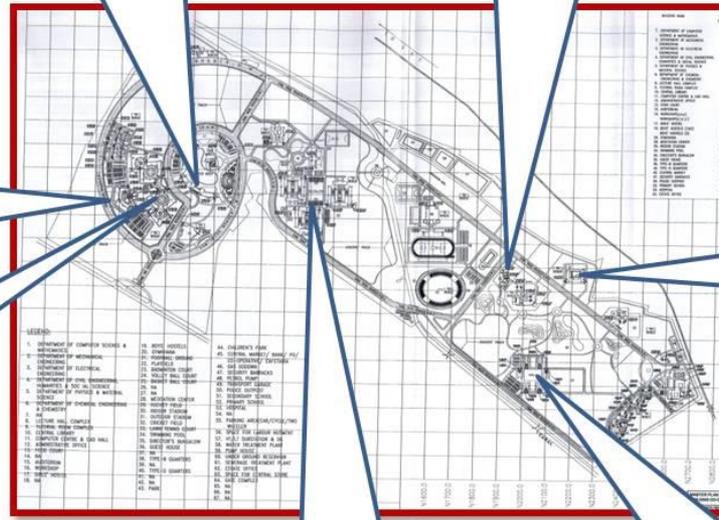
**Administrative Building**



**Director's Bungalow**



**Tutorial Complex**



**Hospital**



**Academic Blocks**

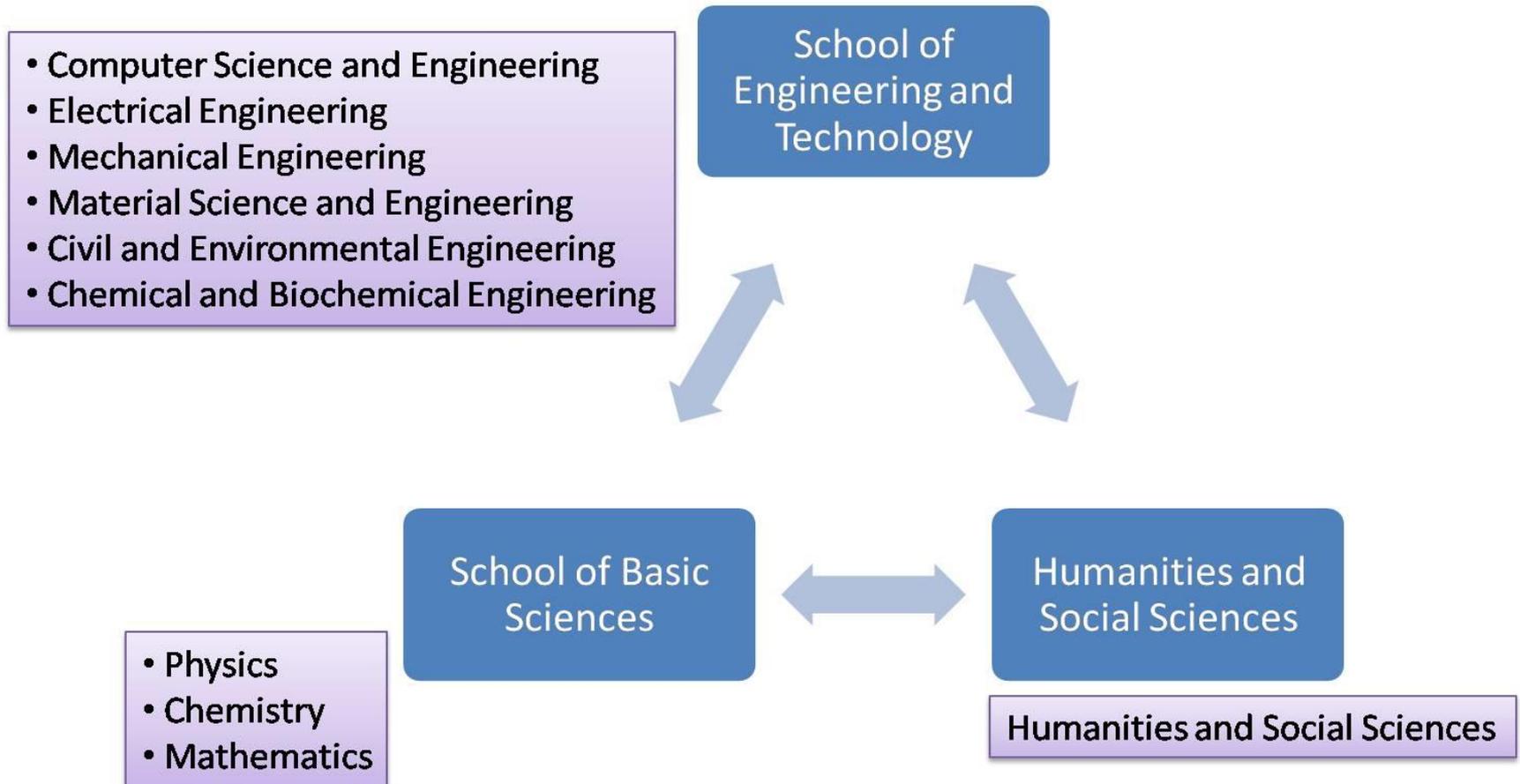


**Boys' Hostel**

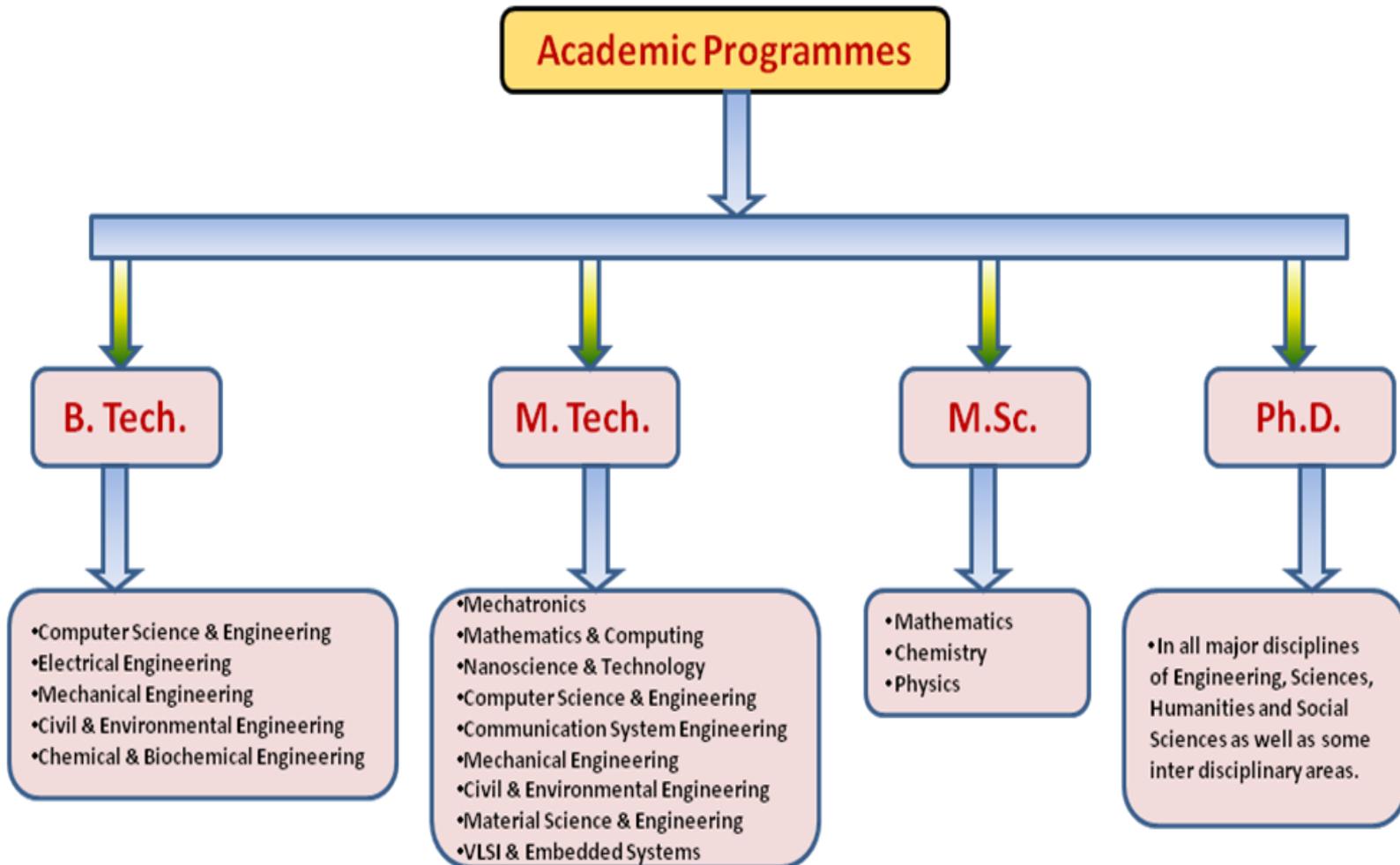


**Faculty Quarter & Girls' Hostel**

# Academic structure



# Academic programmes



# 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)

- ~250 research papers
- Participation in ~280 conferences over the last one year
- More than 150 papers in Scopus listed journals
- 34 new projects worth more than Rs 15 crore sanctioned
- 18 consultancy projects worth Rs 2.35 crore
- Funding from DEITY, ISRO, SERB, SERB (DST), CSIR, DST, REIPL, ASPL, TIFAC, VBP, BUIDCLP, and MHRD, MWR among others

# Convocation: every year on a fixed day- 6<sup>th</sup> August



# Facilities

# Computational resources

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

Central Labs

- 12 High-End UNIX based servers

High end Servers

- Personal Desktops or Laptops
- Individual Multifunction Printers

Faculty Support

- Mailing System
- Web Services
- Storage
- Video Conferencing

Network Services

# Laboratory

- 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

- The total number of books (in hard copy) till date is 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)
  - MeitY (Rs 22.10 crore) and Government of Bihar (Rs.25 crore)
- Technology Business Incubator (TBI)
  - ~13 Cr
  - *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

- MoUs with IST Lisbon, WSU, NTU
- Accenture, Elsevier, EZDI, Tektronics
- Joint masters between WSU and IITP (CSE)

# Research Projects and Centers

# 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

# 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.

# 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<sup>th</sup> International Symposium on Embedded Computing & System Design (ISED)
- 15<sup>th</sup> Asian Conference on Solid State Ionics (ACSSI-2016)

# GIAN Courses (1/2)

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

# Symposium on Modelling and Simulation



# GIAN (2/2)



<b>Course Name</b>	<b>Number Systems for Digital Signal Processing</b>
<b>Foreign Faculty :</b>	Prof. Benjamin Premkumar
<b>Host Faculty :</b>	Dr. Sudhan Majhi
<b>Duration :</b>	17.10.2016 to 23.10.2016
<b>Course Name</b>	<b>Hierarchical Computational Methods for Cross-disciplinary Multiscale Dynamics</b>
<b>Foreign Faculty :</b>	Ganesh Balasubramanian, United States of America
<b>Host Faculty :</b>	Dr. Somnath Roy
<b>Duration :</b>	14-10-2016 to 22-10-2016
<b>Course Name</b>	<b>Modeling approaches of Nanoscale filtration processes of solutions and Suspensions</b>
<b>Foreign Faculty :</b>	Professor Anatoly Nikolaevich Filippov, Russia
<b>Host Faculty :</b>	Dr. Amit Kumar Verma
<b>Duration :</b>	13-07-2016 to 20-07-2016

# Student Life

# Student Activities

- Anwasha: 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 Practice  
TCS Digital Enterprise  
at Tata Consultancy Services



## **Dr. George Puthuran**

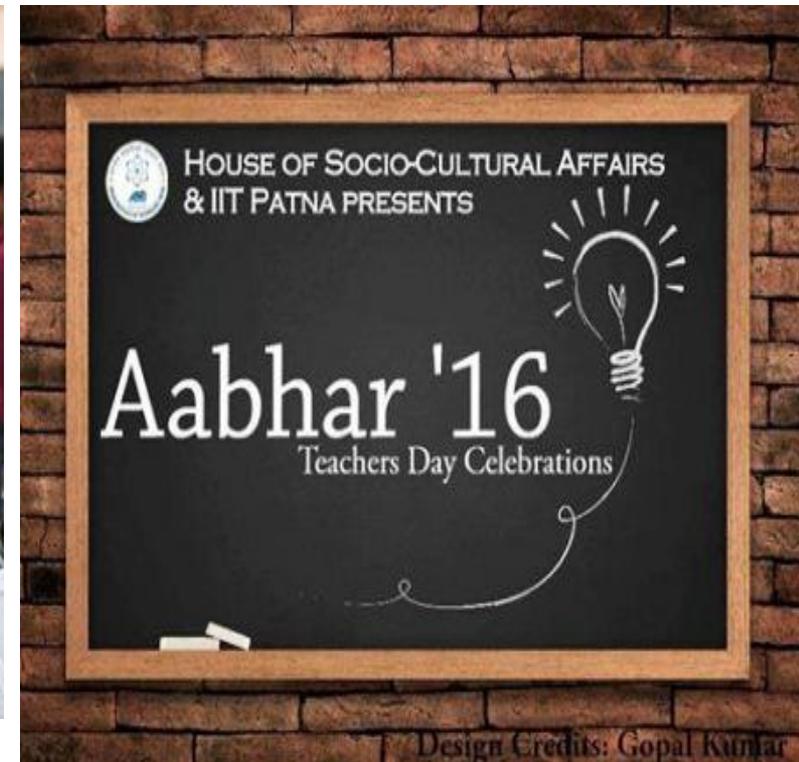
Doctor, Ophthalmologist



## **Dr. Mohan Kameswaran**

Doctor,  
Otorhinolaryngologist

# Teachers day (best teacher lectures)



# Gandhi Jayanti



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# Anwasha



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# Virasat: SPIC MACAY



# Awards and Distinctions for Faculty

- Fellow of National Academy of Engineering
- NASI Scopus Young Scientist
- Senior Members of IEEE, ASME
- Eminent Engineer Awardee, Institute of Engineers
- Vishweshwariya Young Faculty Grant

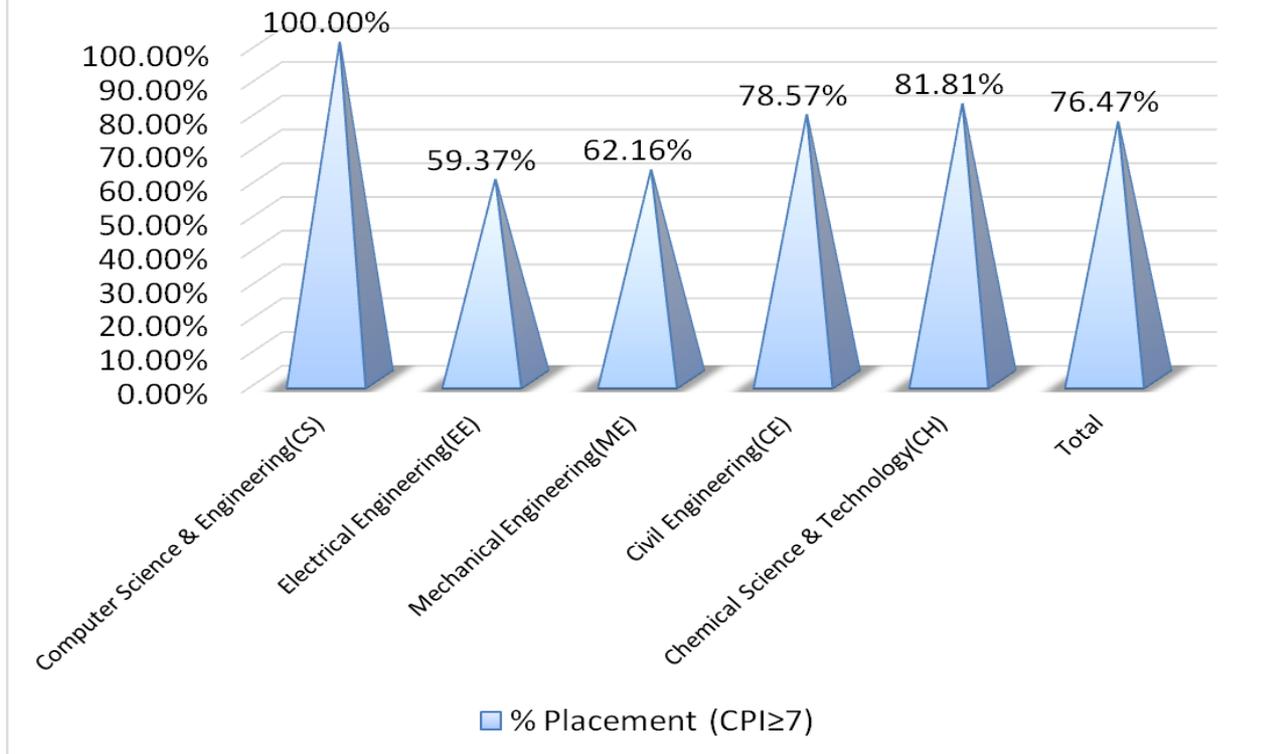
# Student Laurels

- Best paper awards:
  - ICRCs 2017
  - Symhealth 2017
  - 5<sup>th</sup> International conference on Energy Engineering and Environmental Engineering
  - 6th International
  - 43<sup>rd</sup> 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: 3<sup>rd</sup> position in ASME HPVC (Human Powered vehicle Challenge) Asia Pacific 2017

# 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 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



# Advantages of working in IIT Patna

- Attractive Seed Grant to start R&D activities after joining
- Generous support from the institute to set up laboratories
- Collaboration with R&D companies, Govt. organisations and institutes abroad
- Young faculty pool (Average age-35 years): Great opportunity to setup research groups
- Large pool of institute funded research scholars
- Very flexible method of filling patents and transferring technologies
  
- Strong encouragement for sponsored projects and consultancy

# Application Process

- Round the year online application
- Centralised portal on institute website
- Applications scrutinized by department faculty
- Suitable ones called for seminar
- Can offer immediate VISITING position if recommended by department
- Regularised against advertisement
- Regular position: post PhD 3 years; else contract

# Formal selection process

- Typically a 2 day affair
- Selection committee of at least 3 *eminent* experts- representing departmental areas
- Talk in front of experts
- Shortlisting based on seminar for personal interview
- Personal interview next day
- Offer- if suitable- made in 15 days!

# Who gets in

- Remember? *Only the best* 😊
- Talk to assess teaching acumen, depth of research
- Strong publications MUST for getting a call
- Strong letters of reference
- Strong foundations
- Energy, Attitude, Ambition
- Like everywhere else in life- *grace, gumption, guts, grit*

# Who advances

- Aircraft analogy: *Fuel (energy), Control, Direction*
- We do not call “promotion”, but selection at higher level
- Sustained good work, evidenced by publications
- PhD guidance MUST
- Get large projects
- Render service for visibility: PC Member, editorship, lectures outside
- Faculty position is a position of **LEADERSHIP**



21 July, 2017

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# Join IIT Patna

Thank you

# Highlights of departments