



MECHANICAL ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY PATNA



Mechanical Undergraduate Placement Brochure 2018-19
Indian Institute of Technology Patna

For more info: www.iitp.ac.in/placement

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Department of Mechanical Engineering

Vision: Our aim is to engage in the frontiers of the field and channelize the state of art knowledge to train personnel who can solve problems of relevance to the society at large. While imparting high-quality education, the emphasis is being imparted on taking up innovative ideas from concept stage to final product development stage via the route of basic technology research, feasibility studies, technology improvement, demonstration and product development.

About: Since its inception in 2008, Department is advancing towards the frontiers in the field of Mechanical Engineering. Presently the department is offering B.Tech, M.Tech and PhD degrees. The personnel in the Department venture in diverse multidisciplinary fields including surface engineering, soft tissue mechanics, non-traditional manufacturing, laser material processing, condition monitoring, biomedical robotics, biomedical bone drilling, computational mechanics, fracture finite element modelling, composites, fire, micro and nano-scale heat transfer, boiling and condensation, two-phase flows, refrigeration and air conditioning, computational fluid dynamics, colloids and interfacial science, soft computing and microgravity, among others. Such activities are aptly supported by 16 state-of-the-art research cum teaching laboratories. Significant no. of patents and publications in various top multidisciplinary journals is an evidence of the flourishing research environment in the department. Department has received over 5.0 crores of funding support in terms of sponsored projects and consultancy works from various government and industry agencies including Aeronautics Research Development Board (ARDB), Defence Research Development Organization (DRDO), Board of Research in Nuclear Science (BRNS), Department of Electronics and Information Technology (DeITY), Department of Science and Technology (DST), Indian Space Research Organization (ISRO), among others.

Course Curriculum

Major Core Courses

- Solid Mechanics
- Fluid Mechanics
- Thermodynamics
- Machine Drawing
- Engineering Materials
- Manufacturing Technology
- Mechanical Measurements
- Advanced Solid Mechanics
- Mechanical Workshop
- Design of Machine Elements
- Kinematics of Machinery
- Heat and Mass Transfer
- Mechanical Engineering Laboratory
- Applied Thermodynamics
- Machine Design
- Dynamics of Machinery
- Control System
- Industrial Engineering and Operation Research

Major Elective Courses

- Computational Fluid Dynamics
- Dynamics of Structural Members
- Finite Element Method
- Refrigeration and Air Conditioning
- Robotics and Robot Applications
- Robotics: Advanced Concepts and Analysis
- Turbulent Shear Flows
- Aerodynamics
- Composite Materials and Engineering
- Rotor Dynamics
- Mobile Robotics



Research activities

Few recent entrepreneurial student projects:

- Design and fabrication of automated GMAW process and analysing welded zone through image processing.
- Smart hybrid IOT based solar cooker.
- The design of Wind Turbine.
- The design of magnetic microbot.
- Design and fabrication of hybrid harvester.
- Development of robot for municipal waste sorting.
- Robust motion planning of bio-inspired amphibious robots.
- A mechanistic model for prediction of cutting forces in the mechanical micro-drilling process.
- Multi-sensor based intelligent tool condition monitoring in mechanical micromachining.
- Evaluation of burst criteria of zircaloy cladding.
- Studies on Maxwell stress and hysteresis characteristic of poly-acrylic and silicon-based elastomers.
- Design analysis of composite patch repair of structural members by the mesh-free method.

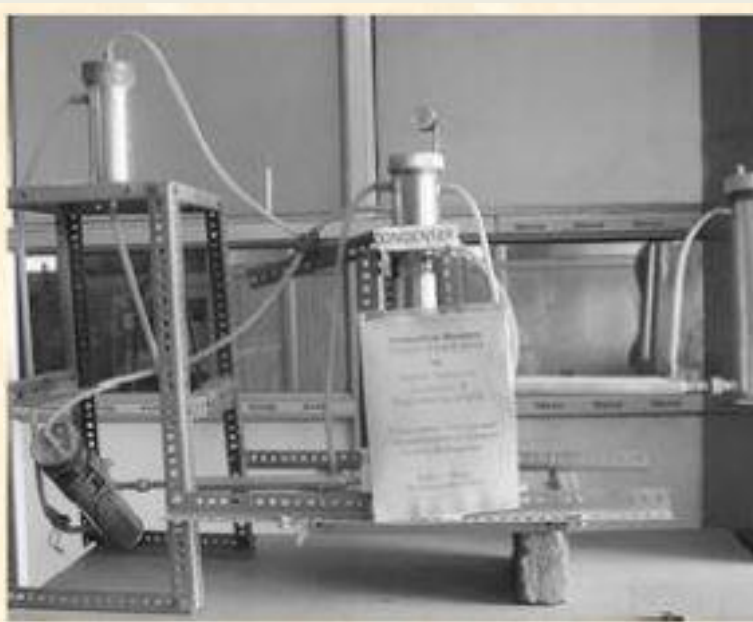
Incubation Centre

Incubation Centre at IIT Patna has been established to set up state of art infrastructure for nurturing technology, Ideas and Innovation in the areas of Electronic System Design and Manufacturing (ESDM) with a focus in medical electronics.

Incubation Centre is funded by Dept. of Electronics and IT, Govt. of India and Govt. of Bihar to the tune of Rs. 471.20 Million

PATENTS

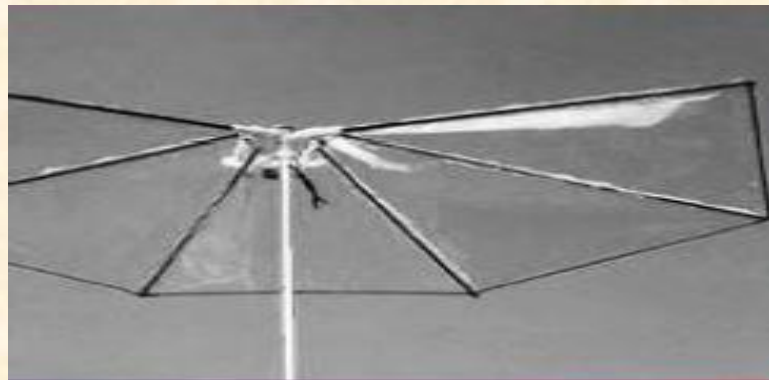
Title	Application No.
Biaxial stretching device	985/KOL/2013
Whirl detection of shaft coupled with an induction motor using full spectrum analysis of motor current signature	1026/KOL/2014
Manual Wheat Harvester	261817
New design application-Handle operated garbage and soil collector	272013/D/NF/SKM



INNOVATIVE PROJECTS



A prototype to test the feasibility of thermodynamic cycle proposed by Einstein and Szilard. Flexible design concepts are implemented thus allows accommodating future accommodations (if any). The experiments on the designed setup confirmed the feasibility of Einstein-Szilard Refrigerator.



“Innovative Student Project Award 2013” by Indian National Academy of Engineering (INAE). “Flapping wing air vehicles” at the conceptual and application level, an attempt on miniaturized ornithopter mechanisms focusing on expanding their usage as surveillance and spying bots.

The robot gripper is capable of identifying any objects using computer vision, position itself using the wheels and pick up the object with the help of inverse kinematic and distance sensor. The bot uses a raspberry pi as high level processor and Arduino for low level control.

Laboratory Facilities



Mechanical Workshop



Instrumentation and Control Laboratory



Heat and Mass Transfer Lab



CAD-CAM Laboratory



Dynamics and Vibration Laboratory



Advanced Manufacturing Laboratory



Fluid Mechanics and Machining Laboratory



Material Testing Laboratory



Computational Fluid Dynamics Laboratory



IC Engine Laboratory



Robotics and Automation Laboratory



Metrology Laboratory



Fire Research Laboratory



Tribology Laboratory



Microfabrication Laboratory

Student Clubs and Events

- **Student Council of Mechanical Engineers**

Keeps students engaged in practical mechanical related activities via regularly organized workshops, events and competitions.

- **SAE INDIA IIT Patna Collegiate Club**

In-house vehicle designing and fabrication is done by students, based on the set parameters and proposed marketing models. These vehicles compete in national competitions like SUPRA, BAJA etc.

- **Rural Technology Development Club (RTDC)**

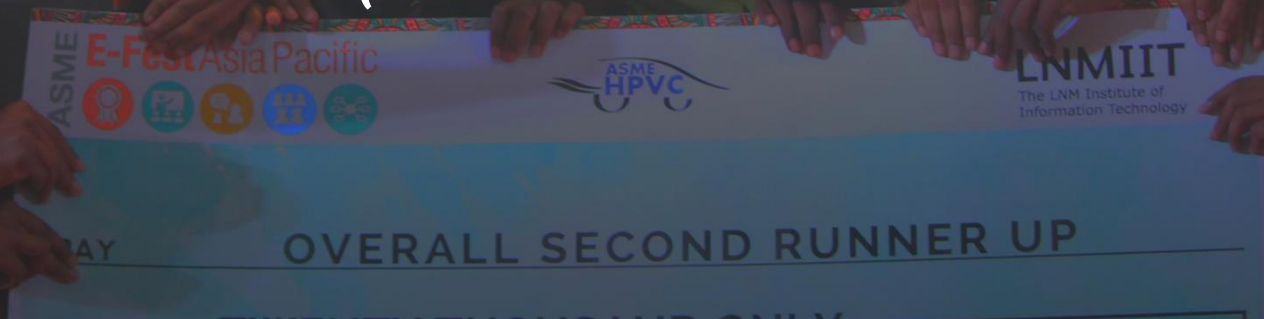
A club dedicated to development of technology providing solutions to difficulties faced by rural India. It governs an educational initiative named “Adhyayan” to provide basic education to students of village government schools.

- **Tinkerer Club**

Under this club, students attend various educational workshops and participate in national competitions like ASME HPVC and ROBOCON. Robocon focuses on designing and manufacturing of robot to complete an assigned task.

Achievements

- Team INVINCIBLES IITP secured overall rank of 14 out of 102 teams registered in Enduro Student India 2018 along with 7th rank in “Endurance Race” and 9th rank in Business “COST” Event.
- IIT Patna’s HPVC became “Overall Second Runner up” in ASME Human Powered Vehicle Challenge (HPVC) Asia Pacific 2017 along with 3rd rank in “Male Drag Race” and 4th rank in “Design event”.
- IIT Patna’s HPVC team secured All India 4th rank in “Innovation event” for consecutively two years in ASME HPVC (2016-India and 2017-Asia Pacific).
- IIT Patna’s HPVC team continues in “TOP 5” for fourth consecutive time in “Design event” of ASME HPVC (2015 & 2016-India and 2017 & 2018-Asia Pacific).



Achievements

- **Best paper award to our mechanical students Vishal Nagarkoti and Omprakash Sahu in the 6th International and 43rd National Conference on Fluid Mechanics and Fluid Power (FMFP) 2016.**
- **Team SUPRA IIT Patna successfully participated in Student formula racing main event “SUPRA SAEINDIA 2018” held at Buddh International Circuit, Noida and secured 22nd rank out of 112 registered teams.**
- **IITP Mechanical Engineering Student's won bronze medals in business event “Markovation” event held during “Inter IIT Tech Meet 2017”.**
- **IITP Mechanical Engineering Student's Team came Runners up in Patna region of “TATA Crucibles Campus 2017” quiz.**

Internships

Students of IIT Patna are encouraged for industrial exposure and student exchange programs.

Students have done Internship at:

➤ Research Internship

- Council of Scientific & Industrial Research
- National Chung Cheng University, Taiwan
- DRDO
- Research Design & Standards Organization
- Bhabha Atomic Research Centre
- IIT Bombay
- IIT Kanpur
- IIT Varanasi (BHU)
- IIT Guwahati
- IIT Delhi

➤ Industrial Internship

- TATA Motors
- IOCL
- IRICEN Training Institute, Indian Railways
- Steel Authority of India Limited (SAIL)
- Pricol Ltd
- Maruti
- BHEL
- Chittaranjan Locomotive Works
- Plasser India
- Mahindra & Mahindra
- NTPC
- Makino Auto Industry
- Bosch India Ltd

Past Recruiters

- Indian Space Research Organization (ISRO)
- Indian Oil Corporation Ltd.
- TVS Motor
- Tata Motors
- Mahindra and Mahindra
- Capgemini
- Skylark Drones
- EdCIL (India) Ltd.
- L&T ECC
- Future First Info Service Pvt. Ltd
- Bharat Petroleum
- Coal India
- Hindustan Petroleum (H.P.)
- Hero MotoCorp
- TimeTooth Technologies
- Defence Research and Development Organisation (DRDO)
- Indian Navy
- TCS Innovation Lab
- Polaris
- Morgan Stanley
- Samsung
- Bank Bazaar
- Tata Technologies
- Flytxt
- Resonance
- Snapdeal
- Deloitte
- Aakash Institutes

आईआईटी पटना के छात्रों ने बनायी फॉर्मूला स्टूडेंट रेसिंग कार

सबसे बेहतर प्रोजेक्ट
स्टूडेंट रेंसिंग कार अन्य फॉर्मूला रेंसिंग कार से अलग है। कारों की डिजाइन पूरी तरह छात्रों की टीम करती है। छात्रों को मेटेरियल स्ट्रक्चर, एक्सेंडाइनमेंट्स, सस्पेंशन डायनेमिक्स, इंटरनल कंशेशन इंजन के बारे में पूरी तकनीकी जानकारी होती है। मैकेनिकल इंजीनियरिंग के छात्रों के लिए स्टूडेंट रेंसिंग कार बनाने को सबसे बेहतर प्रोजेक्ट माना जाता है।

He added: "IIT-Patna provided funds to the team for developing the vehicle, while the other sponsors were NTPC, BRPNNL, PNB, Allahabad Bank and Canara Bank."

The participants will also present a PowerPoint presentation. If the design and specifications are liked by jury, the team will share the idea with them for launch in India market.

SUPRA SAEINDIA is a unique event which blends the awe and beauty of motorsports with learning and experience in teamwork, engineering, marketing skills, etc. Maruti Suzuki provides a platform to engineering students to conceive, design and fabricate a Formula prototype car giving them exposure to real-world challenges and opportunity to refine their skills and learn from mistakes to build on their talent as future entrepreneurs.

- अगले एवं पिछले पहिये का अनुपात 20:26 है ताकि चालक को सामने बेहतर दृंग से नजर आये।

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