IIT PATNA

PLACEMENT BROCHURE

2018-2019

M.TECH (MECHATRONICS)

CONTENTS

ABOUT US

M.Tech in Mechatronics offered by Department of Mechanical Engineering jointly with Electrical Engineering is an interdisciplinary program designed for Mechanical, Electrical, Electronics and Instrumentation Engineers.

Distinguishing attributes include:

In depth knowledge of the fundamentals, design, and working principles of Mechatronics systems.

Study dealing with Mechanical Devices, Sensors, Actuators, Smart Materials, Intelligent Controllers and Devices.

A pedagogy of ‘learning by doing’ experimentation and innovation

Hands on training in Modelling Simulation & Analysis of Automotive, Aerospace, and Robotics Systems.

COURSE CURRICULUM

- First Year emphasizes on theory and its implementation in mini projects.
- Lab courses which provide hands-on experience of working with Sensors, Actuators, PLC, Pneumatics & Hydraulics, Microprocessors, Microcontrollers, Data Acquisition Systems and Computer Vision.
- In-depth training on various software like MATLAB, ANSYS, and SOLIDWORKS is also ensured in coursework.

	Core Courses (3×4 = 12 Credits)
1.	Fundamentals of Mechatronics
2.	Advanced Engineering Mathematics
3.	Sensors and Actuators
4.	Modelling and Simulation

	Elective Courses (3×6 = 18 Credits)
1.	Robotics: Advanced Concepts and Analysis
2.	Embedded Systems
3.	Artificial Intelligence
4.	Finite Element Analysis
5.	Mobile Robotics
6.	Intelligent Visual Surveillance Systems
7.	Aerodynamics
8.	Laser Material Processing

Second year involves individual research and teaching assistantship

Research Work :-

Students undertake projects pertaining to real time problems under the guidance of distinguished faculty members.

LABORATORY FACILITIES

Robotics and Automation Laboratory:

The Lab is equipped with :

- 6 Axis Aristo Robot
- 4 Axis SCARA Robot
- 5 Axis SCORBOT Robot
- Fire Bird XI

Research in this Lab is focussed on topics like Robotics, Smart materials and Cryogenic setups

Mechatronics, Control and Instrumentation Laboratory:

The Lab is equipped with:

- Festo Industrial Automation Kit
- 3D Printer
- 2 ½ axis CNC machine
- Laser Cutting machine
- PCB Rapid Prototyping.
- Data Acquisition Systems by National Instruments

LABORATORY FACILITIES

Instrumentation and Control Laboratory:

The Lab is equipped with:

- Thermocouple, LVDT, Photo Sensor, Strain Gauge etc.
- Programmable Logic Controller
- Traffic Light Controller
- Inverted Pendulum Control
- Magnetic Levitation
- Servo Mechanism

Dynamics of Machine Laboratory:

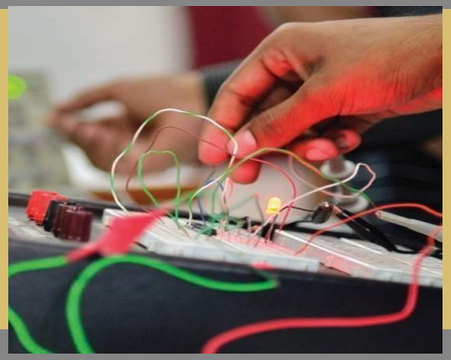
The Lab is equipped with :

- Motorized Gyroscope
- Centrifugal (Watt) Governor
- Active Mass Suspension system
- Machinery Fault Simulator

Research in this Lab is focussed on topics like Fault Simulation in Bearings, Motor, Stator and Rotor, Visco-Elastic Materials

Basic Electronics/Analog Laboratory:

This lab is equipped with Digital Storage Oscilloscope, Mixed Signal Digital Laboratory Oscilloscope, Analog & Digital IC Tester, CAD PSpice Simulation University Suite, Advanced Digital Electronics Kits.



Embedded System Integration Lab

This lab is to promote design and development of hardware based system for improving the quality of life. Embedded Systems, IoT and OS supporting tools are being acquired by the lab.

Digital Signal Processing lab

Digital Signal Processing Lab is equipped with following DSP kits : DM6437 Digital Video Development Platform with Camera , Development to Deployment Code Instrumentation (DDCI) –Interface software , Image and Video Daughter Card Compatible with Texas Instruments 6713/6416,Digital Media Developer's Kit (DM642) With NTSC /PAL Camera.

Microprocessor Laboratory:

This lab provides access to different microprocessors and microcontrollers. Students in this LAB have learned basics of programming on Intel 8086 microprocessor and microcontrollers like Arduino, Raspberry pi.

RESEARCH WORK

Projects undertaken by current batch of students:

- Bio-inspired flying robot
- Machine learning identification of EEG features- A real-time approach for lie detection
- Control of rotor vibration by active damping using superelasticity of shape memory alloys
- Cutaneous and Kinaesthetic Haptic Device using Virtual Reality
- Efficiency improvement in Hybrid Electric Vehicle
- Underwater buoyancy controlled bot
- Design and fabrication of flexible manipulator
- Underwater target tracking using optimal state estimation techniques
- Design and development of flapping based Micro Air Vehicle

Projects completed by previous students:

- Auto targeting and auto-shooting robot for defence purpose.
- Waste Sorting Mobile Manipulator based on Machine learning algorithm for automated sorting of recyclables in a landfill site.
- Human action recognition using egocentric camera
- Using IoT for API development using smart sensors
- A finite element analysis of electro active polymer using ANSYS
- Fabrication and gait planning of alligator-inspired robot and the energy management during various gaits.
- Path Planning of carangiform locomotion on SMA based fish robot.
- Multi sensor based intelligent tool condition monitoring in mechanical micro drilling.

WORKSHOPS AND STUDENT ACTIVITIES

IEEE Student Branch

Students of M.Tech,B.Tech and PhD, IIT Patna promotes technical activities in campus, city and state of Bihar by forming IEEE student branch and organise yearly lectures, IEEE Programs and conferences.

Conferences and Workshops

To augment knowledge of students about recent developments conferences and workshops are organised in the institute like IEEE International symposium on 5G, Workshop on IoT application and Technologies, Symposium on Embedded Computing and System Design, 5th national conference on computer vision, Pattern Recognition and Image Processing and Graphics, Virtual Reality.

Software Training Workshops

A number of timely workshops are organised for the students for providing them exposure and hands-on on the latest software and licensed versions are purchased by the institute for the students to accelerate their research. Some of the companies visiting the institute for conducting workshops are:

MSC Software Adams

ANSYS

COMSOL

AUTODESK

MathWorks

MSC Software Nastran Patran

NATIONAL INSTRUMENTS

OUR PAST RECRUITERS

TVS MOTOR COMPANY	INDIAN NAVY	TATA CONSULTANCY SERVICES	ESYS Masamb	IBM	FINISAR	TRIDENT GROUP	JKT JK TECHNOSOFT
TRANSWEB Tutors	amazon	Google	Epic	SIGMOID	ZEUSNUMERIX	Tricon Infotech	Cognizant
BELZABAR SOFTWARE	Bharat Petroleum Corporation Ltd.	Flipkart	Resonance Educating for better tomorrow	TATA MOTORS	LARSEN & TOUBRO	Morgan Stanley	DRDO
SIEMENS	Hero MotoCorp	Microsoft	Bank of America	SAMSUNG ELECTRONICS	eduvision Career Planning - Educational Services	paytm	cisco

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