

JAN 2023 | VOLUME 5 | ISSUE 2

MECHATRON



A half yearly newsletter of Dept . of Mechatronics, Manipal Institute of Technology, Manipal, MAHE

HOD's Message

The new year brings in renewed energy, new ideas, and a different level of excitement. I wish so does these upcoming semesters be for all of us. I heartily hope that you all continue with the same vigour and valour as the previous year and make tremendous progress both at individual and department level. I also wish the newly joined faculty all the very best and wish a productive year.

Wishing all a happy and prosperous new year!

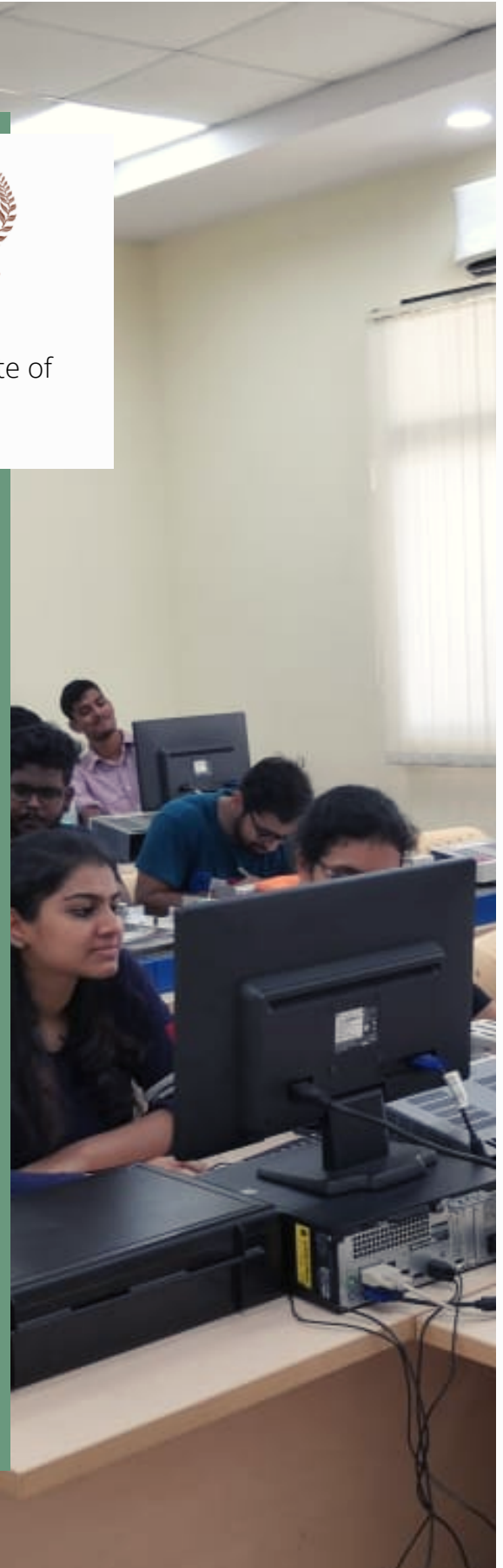
Dr. DV Kamath
Professor and Head
Dept. of Mechatronics



Editors:

Mr. Mahesh Inamdar (Assistant Professor)

Ms. Jennifer Jacob (Assistant Professor)



Vision

Excellence in Mechatronics Education
through Innovation and Team Work

Mission

Educate students professionally to face societal challenges by providing a health learning environment grounded well in the principles of Mechatronics Engineering, promoting creativity and nurturing teamwork

Department

PROGRAM SPECIFIC OUTCOMES

At the end of the course the student will be able to

- Apply the knowledge of sensors, actuators, controls, mechanical design and modern software tools to integrate a system for performing specified tasks
- Articulate design, modelling, analysis and testing of Mechatronics products, systems and controllers using appropriate technology and software tools.
- Interface devices and elements to a central system having the capability of real time data sharing, storage, retrieval, analysis, decision making with global connectivity features for visibility and intervention

GRADUATE ATTRIBUTES

- Engineering Knowledge
- Problem Analysis
- Design/ Development of Solutions
- Conduct investigations of complex problems
- Modern Tool Usage
- The Engineer and Society
- Environment and Sustainability
- Ethics
- Individual and Team Work
- Communication
- Project Management and Finance
- Life-long Learning

PROGRAM EDUCATIONAL OBJECTIVES

The Mechatronics graduates:

PEO1: Are expected to apply analytical skills and modelling methodologies to recognize, analyze, synthesize and implement operational solutions to engineering problems, product design and development, and manufacturing.

PEO2: Will be able to work in national and international companies as engineers who can contribute to research and development and solve technical problems by taking an initiative to develop and execute projects and collaborate with others in a team.

PEO3: Shall be capable of pursuing higher education in globally reputed universities by conducting original research in related disciplines or interdisciplinary topics, ultimately contributing to the scientific community with novel research findings.

PEO4: Are envisioned to become technology leaders by starting companies based on societal demands and national needs.

PEO5: Shall develop flexibility to unlearn and relearn by being in pursuit of research and development, evolving technologies and changing societal needs thus keeping themselves professionally relevant.

Department AT A GLANCE

- Inception 2012
- 7+ MOUs with Industry and Academia
- 10 State of Art Labs
- 5 Student Startups

PROGRAMS OFFERED

- B.Tech-Mechatronics Engineering(2006)
- M.Tech-Industrial Automation and Robotics (2015)

ACCREDITATION

- The National Board of Accreditation has accredited the "B-Tech in Mechatronics" program for a period of 6 years (2019 - 2025).
- Department of Mechatronics also applied for the Institution of Engineering and Technology (IET)Accreditation UK for its B.Tech and M.Tech courses.

PROGRAM OUTCOMES

The POs are exemplars of the attributes expected of a graduate of an accredited programs

PO 1-Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2-Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3-Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4-Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5-Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO 6-Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7-Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8-Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9-Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10-Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11-Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12-Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department Activities

Department Familiarization Program 1st, IIIrd Semesters and M.Tech Programs August - September 2022



For the admitted B.Tech and M.Tech students of the Department of Mechatronics, an orientation program was organized, as done every year since the department's inception. The day started with an interactive presentation on the department's overview and the numerous opportunities offered. The head of the Department Dr. D.V. Kamath held a session for familiarizing rules and regulations, assessment strategies, and research activities of the department. The interaction was followed by the department faculty introduction, research activities, and B.Tech.

Industry Talk on AI-enabled Computer Vision / Image processing 1st November 2022



Dept. of Mechatronics organized a session on AI-enabled computer vision/image processing and its applications in industries. The speaker is Ashutosh Agarwal MD and part of the core tech team at Biocube emphasized the requirement of bridging the gap between academia and industry. Students were motivated to understand the technologies they learn as a part of academics at the conceptual level and encouraged to apply those for product development.

Guest talk

On the 27th of October 2022, Mr. Arun Joshua Cherian, the Founder and CEO of Rise Bionics delivered a talk to the V and VII semesters, students of the Mechatronics department, on “Affordable and Accessible Bionics: Solving big problems in a constrained environment”.



The company designs and manufactures prosthetic legs, prosthetic hands and also spine and head orthotics.

Department Activities

Memorandum of Understanding with Janyu Technologies Pvt Ltd, Mumbai

Department of Mechatronics inked MOU with Janyu Technologies Pvt Ltd which is a master in the field of robotics. This understanding aims to establish a Centre of Excellence on the campus for Research & Development. This would largely benefit all the faculty and students to understand and work in the current industrial challenges.

GROUP DISCUSSION TRAINING

The Department of Mechatronics Engineering organized an interactive training session for incoming 4th-year students on tips and tricks to excel during Group Discussions (GD) phases during the upcoming campus placements in M V Seminar Hall. The sessions were conducted by Prof. Aparna Bhat, TAPMI. All in all, the sessions proved very fruitful to all the students who enthusiastically participated in the session, giving them a lot of insight into the entire process and making them aware of their strengths and shortcomings so they may better prepare for the campus placements. The session was organized by Mr. DAP Prabhakar

Expert Talk by Prof. Animesh Chatterjee

Prof. Animesh Chatterjee Professor, Department of Mechanical Engineering, Visvesvaraya National Institute of Technology (VNIT), Nagpur on visited MIT on 1st Oct 2022 and gave an expert talk on “Critical Engineering Failure in the Last Century”. The talk was informative and intrigued students across the semesters. The session was organized by Dr. Ankur Jaiswal



Department Activities

International Conference on Robotics, Control, Automation and Artificial Intelligence (RCAAI 2022)

Organized by: Department of Mechatronics, Manipal Institute of Technology, Manipal Academy of Higher Education (MAHE), Manipal, India, in collaboration with, Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal, India

SPONSOR'S DETAILS:

KNOWLEDGE & PUBLICITY PARTNER

- International Society of Automation (ISA) Bangalore Section, Student Chapter - MIT Manipal, India
- International Society of Automation (ISA) Automatics Controls and Robotics Division
- International Society of Automation (ISA) Education and Research Division
- Harvesters Desk, India

The delegates were from countries such as the United Arab Emirates, the United States, Sweden, Canada, Botswana, and many others. A total of 303 manuscripts were received and reviewed and 84 articles were accepted based on reviews in line with the requirements of Springer. A total of 264 researchers, the industrial fraternity, and academia participated to the deliberate exchange of problems and ideas on the latest trends in Robotics, Control, Automation, and AI.

Areas of Conference ranged from Robotics & Intelligent Systems, Advanced Control Techniques, IoT, Cyber-Security, Machine Vision & Image Processing, Sensors & Biomedical Systems, Artificial Intelligence & its Applications and Digital Manufacturing.

Organizing Secretary

- Dr. Ankur Jaiswal, MIT Manipal, India
- Dr. Arun Kumar Shettigar, NITK, Surathkal,
- Dr. K Abhimanyu K Patro, MIT Manipal
- Dr. Umesh Kumar Sahu, MIT Manipal



The conference was inaugurated on 24th November 2022 at Sir M Visvesvaraya Seminar Hall of MIT Campus and the chief guest for the inaugural function was Dr. G Satheesh Reddy, Scientific Adviser to Raksha Mantri at the Ministry of Defence, Govt of India. The patron of the conference Cdr Dr. Anil Rana, Director, MIT, Manipal presided over the inaugural session and motivated the participants through his inspirational talk. Prof. S. M. Kulkarni, Dean (R&C), NITK Surathkal, Dr. D. V. Kamath Professor and Head, Dept of Mechatronics, MIT Manipal and Dr. Ravikiran Kadoli, Professor & Head, Mechanical Engineering, NITK, Surathkal, emphasized the need for such conferences to upgrade the knowledge of Mechatronics in emerging areas



Faculty Corner

Completion of PhD & Consultancy Work



Dr. Ishwar Biradi has been awarded Ph.D. after successfully completing his doctoral experimental work in Nano-Machining at IIT Chennai. We congratulate him on this achievement.

He along with Dr. Raghuvir Pai (Professor Mechanical and Manufacturing Dept. MIT Manipal) as Principle Investigator has been awarded consultancy work on Nano lubricants for rotary compressor to the Rotary Compressor Engineering ITS Americas, Ingersoll Rand Bangalore

Startup - Manipal Nova Technologies at MAHE-GoK Bioincubator



Dr. Vijay Babu and his team have successfully registered the company "SVN NOVA TECH" after having been selected for DST NIDHI PRAYAS GRANT of Rupees 10 Lakhs

The company will be hosted at Manipal Govt of Karnataka Bio-Incubator under the FACULTY STARTUP initiative by MAHE. They will be starting the work soon for prototyping using our Institute & Central facilities and at Bio-Incubator

Returning Faculty



Ms. Spoorti Singh has returned to MIT after completing the majority of her doctoral work at the University Putra Malaysia. She also convened a one-day workshop on Robotics Application- Design & Simulation under IEEE RAS chapter in Nov 2022

The topics of the workshop ranged from prospects of Artificial intelligence and the Internet of Things in Robotics, and it concluded with a hands-on session on SIMSCAPE MULTIBODY MATLAB - SOFTWARE. The sessions proved very fruitful to all the students.

NEW JOINEES



Dr Niraj Dewangan completed his Ph.D. at NIT Raipur. He works in the field of Power Electronics and Electric Vehicles. We are hopeful that he pursues his research here and produce remarkable work



Dr. Raghavendra Rao joined the Dept of Mechatronics. He holds Ph.D. from NIT Suratkal and has worked extensively in the area of power electronics in renewable energy. Dept. welcomes him and wishes him all the very best.



Dr. Ramya Moorthy takes a deep interest in the Design and development of robotic solutions for disabilities and EdTech. She completed her Ph.D. from Sastra University and aims to help MIT students conduct research with a social touch,



Dr. Prasad Patil hails from Maharashtra and has completed his Ph.D. at IIT Kharagpur in Dynamics, Navigation, and Maneuvering of Underwater Robotics. Students are poised to be benefitted from this rich grip on his domain knowledge.

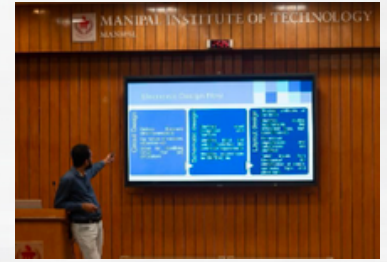


Dr. Nikhil Pachuri has recently completed his Post Doc in South Korea and has joined the department, he has an impressive list of publications and profound research history. He currently works in the field of AI and BioFuels.

Student's Corner

The World of Microcontrollers

The World of Microcontrollers is a seminar conducted by IE Mechatronics. The key speaker of this seminar was Dr. Anish Bekal, an alumnus of Manipal Institute of Technology, the batch of 2004.



Dr. Anish Bekal shared his experience and talked about his start-up based in IISC Bengaluru called E-LAGORI which is a product-based company, they designed and produce different types of microcontrollers depending upon the needs of the customer, they even produced custom microcontrollers as the customer wants. He shared his knowledge of microcontrollers as he established his own startup in the same field. He gave the students deep insight into embedded systems.



MATLAB WORKSHOP - BASICS TO INTERMEDIATE

MATLAB workshop was conducted for B. Tech Students by IE(I) Mechatronics. This workshop ensured that the students knew how to use the basic tools of MATLAB. As the speakers were using the projector, they also gave the students practical knowledge by using various tools in front of them by showing them on the projector and then giving them time to implement the same on their computers. The workshop was a success as it met the goal of getting the students started with MATLAB. The response received by the crowd was good as they got their doubts cleared and were looking for future workshops by the club.

Speakers: Rohith Narayan, Sidharth Kudupudi, Puneet

PYTHON WORKSHOP - BASICS TO INTERMEDIATE



The workshop was aimed at getting M.Tech students started with python programming language. The students were requested to get their laptops, as this workshop promised them hands-on experience in implementing various operations on different python data types.

The response of the students during the workshop and the feedback collected after it suggested that the workshop had successfully attained its goal and the students learned to appreciate the true value of Python as a programming language. At the end of the workshop, they were able to write basic programs in python and were able to implement and import various libraries in different Python classes. The students also learned about the importance of Object Orientated Programming.

Speakers: Vinay Pai, Idhika Jakheta, Bhavya Doshi.

Student's Corner

Ajjarkad Girls High School, Udupi BY IE MECHATRONICS X PROJECT MUDRA

The members of IE Mechatronics in collaboration with Project Mudra went for a school visit to a school located in Udupi, The Ajjarkad girls High school which is an all-girls school. The main aim of our collaboration was to educate the students about the ever-growing field of robotics, and job opportunities. The members first interacted with the Students, asking them if they knew about robotics. The students replied enthusiastically about how they had seen robots in movies, and how the idea of robots fascinates them.



The sparks in their eyes bore witness to how successful our event was. The students were very patient and good listeners and interacted actively when they were asked questions or had doubts. They also requested us to hold more workshops where we teach them how to build a robot.

Speakers: Ameya Vaidya, Siddhant Sinha, Iksha Rani

SOLIDWORKS: Basics to Intermediate

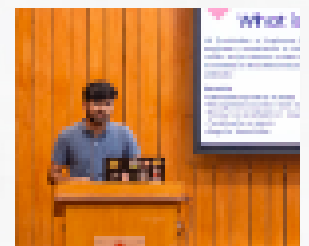
The workshop on Solidworks was conducted by the Mechanical Subsystem of IE Mechatronics. This workshop gave practical knowledge on cad modeling, Autocad, and designing the machine's internal and external components. The crowd received by us was extremely enthusiastic and was keen to learn more and take part in other workshops organized by us. The attendees said they'll approach us if they have any doubts or ideas in the future. Overall, the workshop was a huge success.

Speaker: Ameya Vaidya, Devansh Savani



IE MECHATRONICS General Body Meeting

The general body meeting was conducted to brief the new joiners about our club activities and the task/learning phase. The President gave the new joiners a welcome speech and following up was the faculty advisor, Dr. Ishwar Bhiradi, who shared some inspirational words to motivate our new joiners. The new joiners had a fun interactive time knowing about the club, meeting new people, and interacting with them. All the certificates were given to the deserving members who had taken part in different events.



Student's Corner

Students Achievements



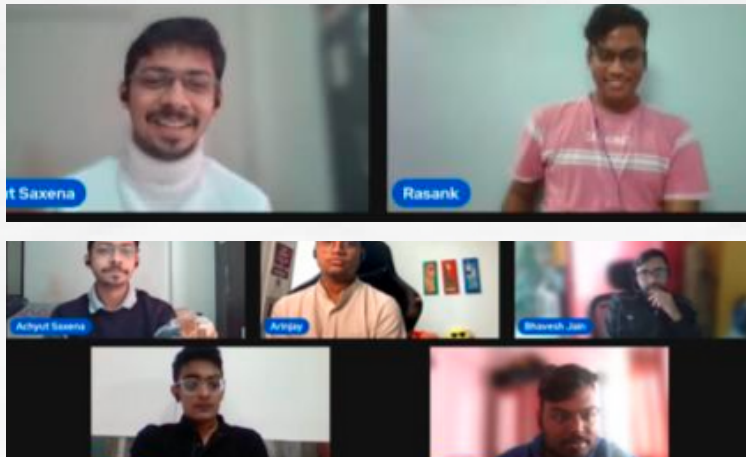
Aditya Vadduri VII Semester a member of AeroMIT along with his partners Won the AeroTHON2022 hosted at S.J.C Institute of Technology (SJCIT), Chikballapur on Nov 18 & 19, 2022.

Naman Bhat VII Sem has won many accolades in the Boxing Championship.



Dassara Games State Level Boxing Championship - Bronze Medal
State Level Boxing Championship - Silver medal

Podcast on Placements



Achyut Saxena VII Sem in an event Placement Diaries hosted live podcasts with students from Mechatronics and MIT regarding their placements in various fields for future reference for upcoming engineers. Students recruited from companies like Tata Motors, Statiq, Enquero Global, Bosch India and GEP, Beghou, and Band & Co. participated. Such informal engagements are a good source of providing students with a better perspective on placements.

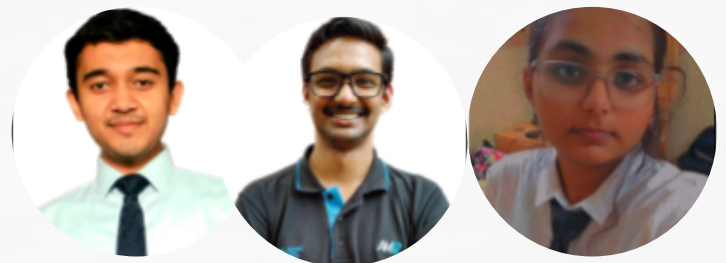
Special Recognition Awards



Mr. Rishab Dugar VII Semester along with his team members won several accolades on the robotx virtual competition.

They design many innovative techniques for the defined application, few to mention are 3D Volume Measuring Instruments, Touchless Pad, Small Multipurpose Bot, Autonomous Wall Painting Bot and Soldering Station.

Smart India Hackaton 2022



Mr. Siddharth, Mr. Aditya, and Ms. Iksha third-year students of the Department of Mechatronics competed in the Grand Finale of the Hardware Edition of the Smart India Hackathon in 2022. After numerous evaluation and judgment stages, both online and offline, for the problem statement defined by Volvo, the team was chosen for the grand finals. Team Mentor- Ms. Jennifer Jacob