

JAN 2022 | VOLUME 4 | ISSUE 2

MECHATRON



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

HOD's Message

Pleased to release the latest edition of Mechatron covering the current events, activities, and accomplishments of the Department. As the new head of this vibrant department, I wish the growth trajectory to continue and reach a much higher echelon.

I also take this opportunity to wish you all a happy new year and hope this year turns out to be more successful, prosperous, and fruitful.

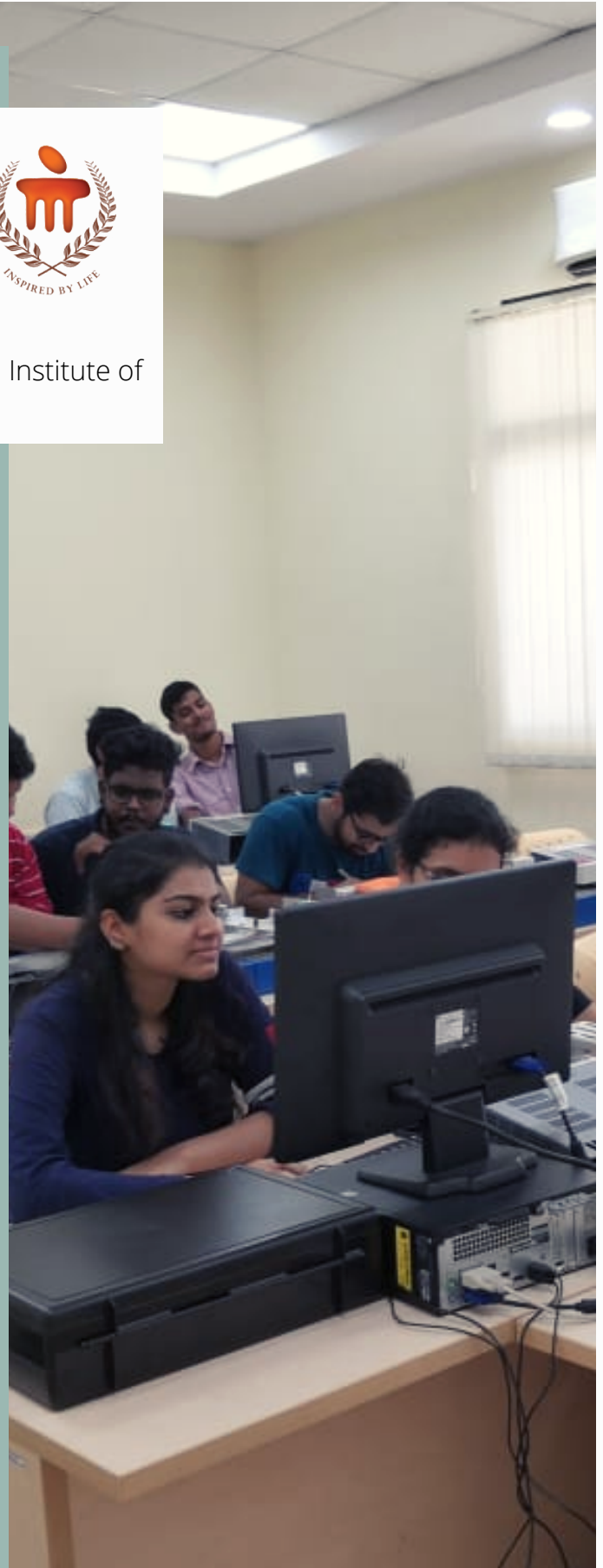
Dr. DV Kamath
Professor and Head
Dept. of Mechatronics



Editors:

Mr. Mahesh Inamdar (Asst Professor)

Ms. Dolly Sharma (Asst Professor)



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

Vision

Excellence in Mechatronics Education through Innovation and Team Work

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
- 5+ 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 Engineering also applied for Institution of Engineering and Technology (IET)Accreditation UK for its BTech and MTech 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.

Message from the outgoing HOD



It gives me immense pleasure to inform you all that I had a wonderful time with you all ever since I took over as Head of the Department of Mechatronics from 25-07 2012, the day the Mechatronics department was born. Though I headed the department for a long time, each day was filled with challenges, and had a lot to learn from. I tried my best to develop the department and make the learning more industry-oriented.

Over these years I had the opportunity to meet some of the most learned faculty members of wide areas of interest and many brilliant students who have carved a niche for themselves in this highly competitive industry. I feel grateful to be a part of this journey and humbled to have excellent cooperation and contribution from all faculty members and students,

Like me, I am sure; all of you have dreams for department, professional, and career. All of you have long years to go in your professional life and wish each one of you the very best. Your support to me was unparalleled and wish you continue to support the new HOD with even more enthusiasm and efficiency. If I just say thank you all for your support that will be a gross understatement. However, I have no words that I could aptly express the supports I enjoyed. If knowingly or unknowingly I might have hurt you by my words, actions, gestures by any other means, kindly excuse me.

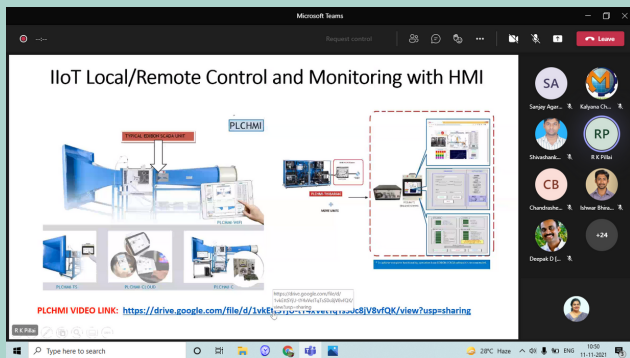
I will be passing the baton to the newly appointed HOD, Professor, Dr. D V Kamath on 15-12-2021 and wish him all the best and wish you all support him with full heart and enthusiasm. I will still be serving this esteemed institute as Associated Director, Quality Assurance.

If you ever would like to have chat with me, you are always welcome no matter where I am.

Dr. Chandrashekhar Bhat.
Associate Director - Quality Assurance
Professor and Former HOD
Dept. of Mechatronics, MIT, Manipal

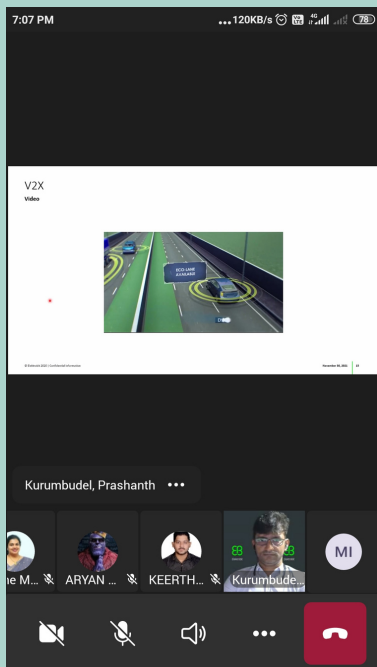
Department Activities

INDUSTRY TALK ON "ADVANCE INNOVATIVE RESEARCH-BASED TEACHING SYSTEM USING INDUSTRIAL EQUIPMENT"



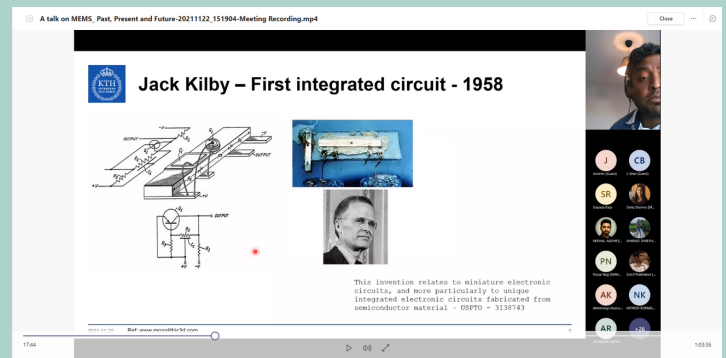
Department of Mechatronics conducted an INDUSTRY TALK 11th Nov 2021 on "Advance Innovative Research-Based Teaching System Using Industrial Equipment". Mr. Rajendra Pillai President and CEO of AIPL Tech Pvt Ltd talked at length about the latest trends and technology in the Research-based teaching domain. Dr. S. Hiremath coordinated the event.

INDUSTRY TALK ON "TECHNICAL TALK ON "CONNECTED CARS, IOT AND CLOUD"



Department of Mechatronics, MIT, and Swarm Robotics, Student major project team, MAHE, Manipal has conducted a technical talk on "CONNECTED CARS, IoT and Cloud". In this talk, Mr Prashanth Ram Kurumbudel presented how connected cars technology centres on current trends, architectures, and future research for enabling safe, networked wireless communications among vehicles and personal communications devices. The technical talk was open to ALL Faculty/Researchers and Students of MIT.

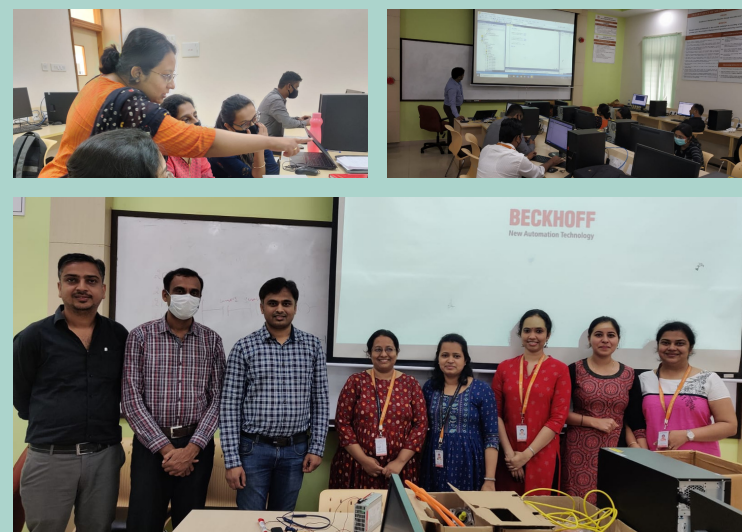
RESEARCH TALK ON "MEMS: PAST PRESENT AND THE FUTURE"



Department of Mechatronics, MIT, MAHE, Manipal conducted an online session on "MEMS: past, present and future" by Adjunct professor Dr. Hithesh Kumar Gatty, post-doc researcher at KTH Royal Institute of Technology Stockholm. Ms. Maithri M. coordinated the event

TWINCAT PLC PROGRAMMING TRAINING SESSION

Department of Mechatronics conducted a training session for faculty and students on the TWINCAT PLC programming in the Industrial Internet of Things lab for three days (17-20 Dec 2021).



Faculty Corner

MASTER'S JOURNEY



Mr. Shashank Pansari has decided to pursue his master's studies in environmental science, a ardent interest of this own. We wish him all the success.

INDUSTRIAL TRAINING



Dr. Shivshankar Hiremath has got selected for TOT program on robotics and automation operated under the SANKALP scheme, by Min of Skill Development and Entrepreneurship , GOI in collaboration with ASDE, MAC and GiZ

RETURNING FACULTY



Mr. Ishwar Biradi has returned after completing majority of this doctoral experimental work in Nano-Machining at IIT Chennai. We are delighted to have him back and look forward for this fruitful contribution to the department.

WINNER OF HACKATHON



Dr. Vijay Babu and his team from Dental Science and Architecture School have secured first position in **Bio-Incubator Grand Challenge** and will soon be writing proposal for a grant. We wish him all the best of luck.

FACULTY OVERREACH



Dr. Narendra Khatri gave a talk on *Role of Artificial Intelligence in Precision Agriculture* at Sir Padampat Singhania University Udaipur organized by Dept. of Computer Science and Engg.



Dr. Pooja Nag has received a grant of 1.3 Crore in collaboration with IIT Bombay, Dept. of Instrumentation and Control Engineering and Manipal Institute of Virology by **DST NANOMISSION**. She and her team will be working on *point of use sensors for rapid detection and differentiation of bacteria and virus in water and clinical samples*



Dr. Vijay Babu delivered session at Five-Day Online NATIONAL AICTE ATAL FDP ON "ELECTRIC TRANSPORTATION INFRASTRUCTURE FOR E-MOBILITY IN INDIA (Advanced)" organized by Department of Electrical Engineering, National Institute of Technology, Warangal during 08th to 12th Nov 2021.

Faculty Corner

NEW JOINEES



**DR. ABHIMANYU KUMAR
PATRO K**
PH.D. (CYBER SECURITY)
NIT RAIPUR

Dr. Abhimanyu hail from Orissa and has a doctorate degree in cybersecurity from NIT Raipur. His domain has been on top of research areas and the department and students are poised to be benefitted by his knowledge and expertise.



DR. NARENDRA KHATRI
PH.D. (MECHATRONICS SYSTEMS)
LNM-IIT JAIPUR

Dr.Khatri has a doctorate in Mechatronics systems and has even pursued Post Doct hereafter. He is on the Review and Marketing board of many reputed journals and takes a deep interest in students' project and publication.



DR. SHILPA SURESH
PHD (SATELLITE IMAGE
PROCESSING)
NIT SURATKAL

Shilpa Suresh since 2012 has been into teaching and research and has many publications in peer-reviewed journals/transactions of IEEE, Elsevier, Springer, Taylor and Francis, and so on. Her research interests are in the fields of Image Processing, Optimization algorithms, Artificial Intelligence and Machine Learning. She was awarded University first rank for her master's and Best Ph.D. Thesis Award at Ph.D. Symposium, MIND 2019 at National Institute of Technology Kurukshetra.



DR. UMESH KUMAR SAHU
PH.D. (ROBOTICS AND MACHINE
VISION)
NIT ROURKELA

Dr. Umesh Sahu has tremendous academic experience in the field of Image Processing and Robotics and works extensively in these areas. He has many publications and book chapters written under him.



DR. VIJAY MOHAN
PH.D. (INSTRUMENTATION &
CONTROL) NSIT NEW DELHI

Dr. Vijay Mohan works in the areas of Instrumentation and Control and takes a deep interest in the areas of Drug delivery, nonlinear and adaptive controllers. He's also keen in guiding students in their projects.

Transferred Faculty



DR. DEEPAK D
ASSOCIATE PROFESSOR

Dr. Deepak D works in the areas of intelligent automation, Robotics in the field of agricultural activities. He's associated with department committees for industrial liaison and projects.



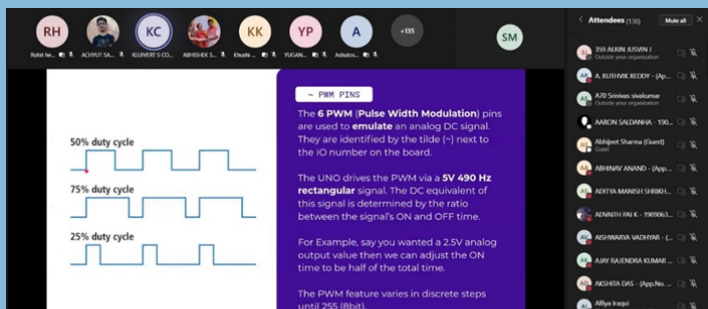
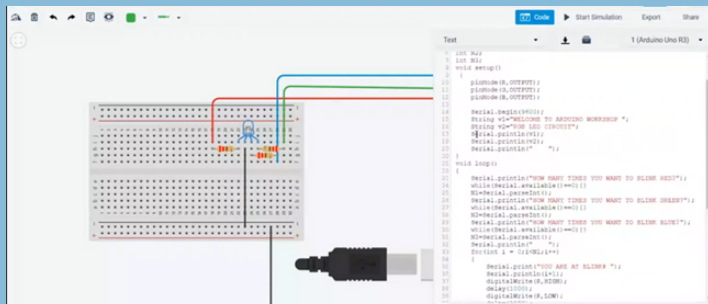
**DR. RAGHAVENDRA
PRABHU P**
ASSOCIATE PROFESSOR

Dr. Raghavendra Prabhu works in the area of Engineering Materials, Heat Treatment and their optimization process. He is currently deputed to Deputy Registrar - Administration, Manipal Academy of Higher Education, Manipal.

Student's Corner

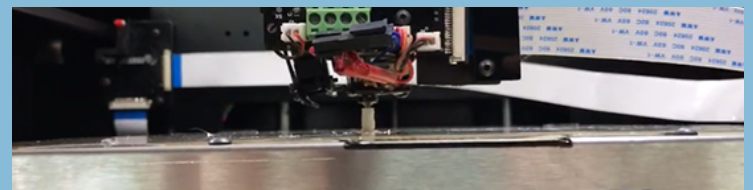
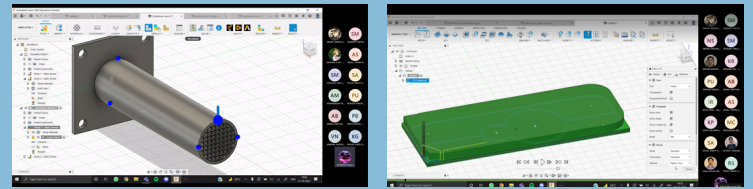
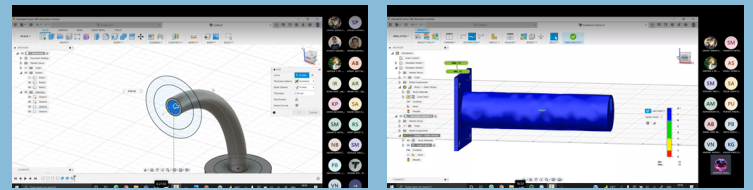
WORKSHOP ON GETTING STARTED WITH ARDUINO - IE MECHATRONICS

IE Mechatronics conducted three days workshop on the Arduino, Tinker CAD, and their applications with the aim to bring out enthusiasm among the students about the Arduino ecosystem. This was open for all, and was participation of 238 students across institution.



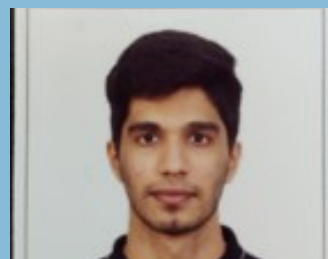
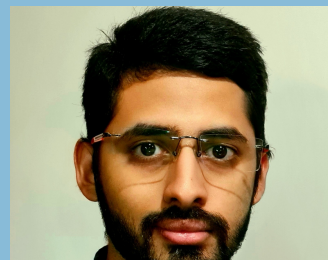
WORKSHOP ON FUSION INTERMEDIATE AND ADVANCE - IE MECHATRONICS

IE Mechatronics conducted a four days' workshop aimed to upskill the students about Fusion 360, with little to no restrictions on who could enter. This workshop was very informative and highly structured and was conducted on Ms Teams. The students learned about different intermediate and advanced level tools as well as a detailed discussion on isographic and orthographic views was carried on



NOVEL DESIGN OF AN 'ARECA NUT ROBOT HARVESER'

Neehal Sharma, Pranesh G, Darren DSouza, and Sagar Shenoy of 7th Sem, were granted an Australian Innovation Patent in November 2021 for their novel design of an "Areca Nut Robot Harvester" for areca nut harvesting and pesticide spraying, providing an electric-powered , eco-friendly alternative to existing harvester solutions on the market.



ROBOTICS FEST OF IIT DHANBAD

Sahas Agarwal and his team have secured first position in the event VICHESTA of TAKSHAK 2021, Robotics Fest of IIT Dhanbad