ACHARYA

ACHARYA INSTITUTE OF TECHNOLOGY

NAAC A ACCREDITED

Department of Mechatronics Engineering

Intelligent Mechatronics Systems

Robotics, AI & Sensor Fusion

ROBOMANTHAN

16th to 20th February, 2026 | 09:00 AM to 05:00 PM

Venue: CAD Lab, ME Seminar Hall, Acharya Campus

About the Program

This program delivers practical training in building intelligent robotic systems, integrating ESP32 embedded hardware with AI/ML techniques like YOLO object detection, sensor fusion, and ROS-based SLAM. Participants progress from basics (LED control, data acquisition) to advanced applications (real-time face/gesture recognition, anomaly detection, predictive maintenance)

Objectives of the Program

- Introduce core concepts of robotics (sensors, actuators, controllers), embedded systems (ESP32, Arduino), and AI/ML fundamentals (classification, regression, vision, motion control) to enable system design.
- Develop proficiency in hardware-software integration, including ESP32 GPIO, sensors (ultrasonic, IR, temperature), actuators (servos, DC motors), and data protocols.
- Teach data acquisition, pre-processing, annotation, and visualization using Python libraries (NumPy, Pandas, Matplotlib, OpenCV) for sensor and IP Webcam streams.
- Cover AI applications: supervised/deep learning, YOLO object detection, reinforcement learning for navigation, face/gesture recognition, anomaly detection, predictive maintenance, and ROS-based SLAM with LiDAR/odometry.
- Foster skills in sensor fusion, multi-model learning, real-time processing, and prototyping via mini-projects, challenges, and a final hackathon-style project.

Expected Outcomes of the Program

- Assemble and program ESP32-based systems for sensor-actuator control, data logging, and real-time visualization, demonstrating LED/sensor projects.
- Collect, label, pre-process, and analyse multimodal data (sensors, video) for ML readiness, including noise removal, normalization, and feature extraction.
- Implement AI models for robotic tasks: real-time object/face detection (YOLO), gesture recognition, autonomous navigation (RL), and SLAM (ROS/LiDAR).
- Integrate multi-sensor fusion (encoders, odometry) for anomaly detection, predictive maintenance, and intelligent decision-making in mechatronic systems.
- Design, prototype, and present a complete intelligent mechatronics project (e.g., sensor-fused robotic application), ready for hackathon competition or industry deployment.

Target Audience: 6 th Sem Students of Mechatronics Engineering

Committee Members

ADVISORY COMMITTEE

- Dr. C. K. Marigowda,Principal, Acharya Institute of Technology

CONVENER

- Dr R M Devarajaiah, HOD Mechatronics Engineering

COORDINATOR

- Dr Pramod Kumar Thotapalli ,Associate Professor ,Mechatronics Engineering
- Naveen Kumar S N ,Assistant Professor ,Mechatronics Engineering

Resource Persons

Saurav Kumar
Designation: Founder
Robomanthan Pvt. Ltd. (IIT Patna Incubated)

Abhilash Dandu
Designation: Technical Trainer & Embedded Systems Engineer

Acharya Institute of Technology

Acharya Dr. S. Radhakrishnan Road, Acharya P.O
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LOCATE US

Event Coordinator

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