

Department of Automation and Robotics**Pedagogy Report**

Name of The Faculty Members: Prof. Indira Ghosh Dastidar (Theory)
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Class	TE
Course Taught	Sensors and Vision Systems in Robots
Academic Year	2024-2025
Title of Pedagogy	Flipped Classroom and Peer Discussion
Methodology	<p>Concept-Based Modular Teaching: Break down the syllabus into thematic modules such as proximity sensors, vision algorithms, and real-time applications to facilitate focused learning. Use concept-mapping tools to connect sensor types with their use cases in robotics.</p> <p>Hands-On Laboratory Integration: Use simulation platforms (e.g., MATLAB, ROS) and real-time microcontroller-based setups (e.g., Arduino, Raspberry Pi) to allow students to implement sensing and vision algorithms. Include mini-projects like object detection using OpenCV.</p> <p>Flipped Classroom Model: Deliver core concepts through pre-recorded video lectures or readings, and use class time for discussion, doubt-clearing, and case-study analysis.</p> <p>Case-Based and Application-Oriented Learning: Integrate case studies from industries and research to show real-world relevance of sensors and vision systems.</p> <p>Guest Lectures and Industry Exposure: Include expert sessions from alumni working in robotics, post-doc researchers from IITs (e.g., IIT Kharagpur), and field engineers.</p> <p>Organize industry visits (e.g., to automation labs or power plants) to observe sensor integration in practice.</p> <p>Continuous Assessment and Reflective Learning: Peer-reviewed assignments, and reflective journals to track understanding and promote self-evaluation.</p>
Outcome	<ul style="list-style-type: none">• Understand and explain the working principles of various sensors and vision systems used in robotic applications. (Bloom's Level: Understand)• Analyze sensor data and apply signal conditioning techniques for robotic decision-making. (Bloom's Level: Analyze)• Design and implement basic vision-based solutions using tools like OpenCV for object detection and tracking in robotics. (Bloom's Level: Apply/Create)• Evaluate the performance and suitability of different sensing and vision techniques in real-time robotic environments. (Bloom's Level: Evaluate)

Images/evidence:





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HOD
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