



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Intelligent Manufacturing and Automation

ENGRTEC 4500

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Course Components:

Lecture

Lab

Course Description:

Intelligent Manufacturing and Automation is a 3-credit course in advanced robotics and automation designed to teach students complex integrated manufacturing systems to solve industry-related issues. Along the way, this course will provide you with opportunities to work individually as well as in teams to accomplish tasks using the Connected Smart Manufacturing system cell.

Prerequisites and Co-requisites:

Pre-reqs: 2100, 3600, 4200

Course Goals / Objectives:

- Students will gain a thorough understanding of quantitative analysis techniques applied to advanced manufacturing processes
 - Gain exposure to a functional automation system through laboratory exercises and computer simulations
 - Develop skills in planning for automation implementation, employing RFID technology, utilizing data-driven controls, analyzing part tracking data, and engaging data communication links
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Course Topics:

- 1. Be able to operate and program systems such as laser etching and RFID technology
 - 2. Understand the basics of an automated storage and retrieval system
 - 3. Use CAD models to initiate new fixtures, part carriers, bins, or robot tooling to introduce new tasks or optimize an automation system
 - 4. Combine knowledge of PLCs, Robotics, smart sensors, conveyors, and more to integrate them in an automation system using a PLC master scheduler
 - 5. Recognize and understand the communication between components in an automation system containing multiple inputs and outputs that operate as a complete integrated system
 - 6. Determine if safety systems are working, and rectify issues if present
 - 7. Gather and interpret manufacturing data, including quality and performance metrics
 - 8. Apply organization tools such as theory of constraints or bottleneck analysis
 - 9. Apply techniques such as sensors, gauges, new programming etc to error-proof a system
 - 10. Apply technical modifications and effectively communicate with a wide variety of people with various skill levels and areas of expertise to incorporate new processes into an existing system
 - 11. Analyze, communicate, and engage with other business units to optimize processes and profits
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Designation:

Required