



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Industrial Automation

ISE 5520

Credit Hours:

1.50 - 1.50

Course Levels:

Undergraduate (1000-5000 level)

Graduate

Course Components:

Lecture

Lab

Course Description:

Industrial Automation teaches the design, application, and computer logic and control of various mechanical, pneumatic, electrical, and electronic sensors and actuator devices for industrial systems.

Prerequisites and Co-requisites:

Prereq: 2500, or Grad standing in Engineering.

Course Goals / Objectives:

- The general goal of ISE 5520 is to introduce engineering students to the fundamentals of industrial automation. Specifically, upon completion of ISE 5520, students should be able to:
 - 1. identify the characteristics of manufacturing processes, assembly and material handling operations that lend themselves to automation vs. manual operation 2. determine if the automation should be fixed, programmable, or flexible
 - 3. demonstrate proficiency in the selection and use of sensors, actuators, interface devices, and process controllers for automation devices and process control
 - 4. for tasks described in prose, generate ladder logic for programmable logic controllers (PLC?s), and demonstrate the performance of automation and control systems using PLC?s
 - 5. specify, select, wire and plumb electro-pneumatic devices, circuits and systems for automation
 - 6. demonstrate knowledge of safety issues in the design and use of automation devices and systems
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Course Topics:

- Course learning objectives, course and lab administration, introduction to the principles of industrial automation and safety issues. Introduction to pneumatics. Lab 1: Create a basic circuit using pneumatic devices.
 - Introduction to Programmable Logic Controllers (PLC's). Lab 2: PLC basics; power supplies, switches, relays, and ladder logic
 - PLC timers and counters. Lab 3: Build and demonstrate a PLC/pneumatic/LED device utilizing timers/counters.
 - Introduction to control systems using industrial sensors with PLC's. Lab 4: Build and demonstrate a control device using sensors, PLC, and actuators.
 - Control systems and plant floor communications. Lab 5: Build and demonstrate a more complex control device using sensors, PLC, and actuators.
 - Introduction to electric motors and motor control. Lab 6: Control a servo motor via closed loop control
 - Troubleshooting automated systems. Lab 7: Open for remedial lab work, or troubleshooting experience
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Designation:

Elective