



Faculty of Eng. & Natural Sci.

ME308-202301

Industrial Control

Instructor(s)

Name	Email	Office	Phone	Web	Office Hours
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Course Content

This is an course that covers industrial control systems. The specific topics include: control systems architectures; transducers and actuators; communications in industrial control systems - industrial LANs; sequential control - programmable logic controllers; direct digital control and supervisory control; structures of SCADA systems; case studies.

Objectives

To provide the students with the foundations of modern industrial control in the machine automation context.

Recommend or Required Reading

Readings

Pdf documents related to Siemens S7 300 PLCs, Beckhoff industrial PCs.

Optional Readings

Title: Automated Manufacturing Systems
Author: S. Brian Morriss
Year: 1994

Publisher: Mc Graw Hill

Title: Automation Systems for Control and Data Acquisition

Author: Lawrence T. Amy

Year: 1992

Publisher: ISA (Instrument Society of America)

Series: Resources for Measurement and Control Series

Title: Practical Process Control

Author: A. M. Seal

Year: 1998

Publisher: Arnold

Hans Berger, Munich, Automating with SIMATIC, Publicis MCD Verlag, Munich

Lawrence T. Amy, Automation Systems for Control and Data Acquisition, ISA

Assessment Methods and Criteria

	Percentage(%)	Number of assessment methods
Final	25	
Midterm	20	1
Quiz	5	5
Assignment	35	5
Participation	5	
Homework	10	5

Course Outline

Week 1:

Introduction

PLC (Programmable Logic Controller)

Resources

Hard wired logic

Week 2:

PLC

Ladder Logic Program (LAD)

Week 3:

PLC

Statement List Program (STL)

Linear Programming

Partitioned Programming

Week 4:

PLC - Structured Programming

Week 5:
Wiring Diagrams

Week 6:
Wiring diagrams

Week 7:
Industrial PCs
Industrial Networks
Structural text programming

Week 8:
Structural text programming

Week 9:
Graphical User Interfaces

Week 10:
Robotics

Week 11:
Robotics

Week 12:
Sensors

Week 13:
Actuators

Learning Outcomes

List main types of industrial automation systems and industrial actuation and sensor systems
Identify the individual design steps in an industrial automation project.
Design automation systems with industrial control components.
Compare different industrial control strategies.
Draw wiring diagrams.
Program Programmable Logic Controllers (PLC) and Industrial Robots
Develop Graphical User Interfaces
Work with industrial communication networks
Wire and instrument basic industrial sensors and actuators.
Develop skills to adapt industrial control components to their automation design.
Develop problem solving and planning skills and work effectively as part of a team

Course Policies

This is a physical-only course.

Attendance to a minimum of 70% of lectures is required to be admitted to the final exam.

More than 70% attendance earns participation points.

Pop quizzes.

Weekly laboratory work (week 2-week 13, weeks subject to change.)