



Faculty of Eng. & Natural Sci.

ME308-202202

Industrial Control

Instructor(s)

Name	Email	Office	Phone	Web	Office Hours
Kemalettin Erbatur	erbatur@sabanciuniv.edu	FENS-1090	9585	http://people.sabanciuniv.edu/~erbatur/	

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	30	
Midterm	20	1
Quiz		0
Assignment	36	4
Homework	14	4

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

Lectures will be in the classroom.
Lectures will be broadcasted online.
Lecture videos will be shared.
Attending lectures in the class (in person) is encouraged but is not a must.

Weekly laboratory work (weeks subject to change.)