

## DEA-IND-521 Automation and Advanced Control

**SEMESTER:** Spring

**CREDITS:** 6 ECTS (4 hrs. per week: 2 Theory + 2 Lab)

**LANGUAGE:** Spanish

**DEGREES:** MII

### Course overview

This course is divided into two main blocks: Automation and Advanced Control systems. Upon satisfactory completion of the Automation block, the student will be able to: use of different technologies (PLC, RFID, SCADA, vision) for controlling an industrial process; apply safety and reliability requirements. Advanced Control block focuses on control techniques that outperform the basic PID control, such as Predictive Control and Adaptive Control.

### Prerequisites

Electric Circuits, Logic Circuits, Programming principles. PID feedback control.

### Course contents

#### Theory:

1. Introduction.
2. Automation Hierarchy.
3. Limitations of classic control strategies.
4. Adaptive Control.
5. Predictive Control.
6. Control Centers.
7. Use Cases on Industrial Automation.
8. Reliability, Availability and Safety.

#### Laboratory:

- P1. Control with Programmable Logic Controllers
- P2. Process visualization.
- P3. Product identification and product control.
- P4. Robot integration.
- P5. Predictive Control.
- P6. Adaptive-Predictive Control.

## Textbook

- No textbook

## Grading

- Automation block accounts for 2/3 of the grade, and Advanced Control block for 1/3. A grade of 5 is required in each of both blocks.

Automation block will be graded as follows:

- Final exam accounts for 40% of the final grade.
- Continuous evaluation quizzes account for 10%.
- Laboratory accounts for 50% of the final grade.
- A minimum grade of 5 is required on the final exam and on the lab to pass the course.
- Students getting good grades during the course will be offered to replace the final exam by an automation project of enough complexity.

Advanced Control block will be graded as follows:

- Final exam accounts for 70% of the final grade.
- Laboratory accounts for 30% of the final grade.