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.
3. Limitations of classic control strategies.
5. Predictive Control.
6. Control Centers.
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.

---

This document is a brief outline of the course and does not replace the official program of study  
www.icai.comillas.edu
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.