Universidad Zaragoza

Academic Year/course: 2024/25

39631 - Automation and Industrial IT

Syllabus Information

Academic year: 2024/25
Subject: 39631 - Automation and Industrial IT
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 608 -
ECTS: 6.0
Year: 4
Semester: First semester
Subject type: Compulsory
Module:

1. General information

The fundamental objectives of the subject can be divided into two types Theoretical and Practical.

The theoretical contents aim to provide the student with the necessary concepts for the analysis and development of controls of different industrial processes.

- Define the concept of control system and identify and distinguish the variables acting on the process.

The practical contents introduce the student to the handling of industrial components.

- Understand the systems used for discrete control.
- Program industrial PLC's for process control and manage industrial sensors and actuators.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results...

- Understand concepts related to industrial automation and control.
- Programming and commissioning systems based on PLC's, Scadas and robotic systems.
- Master modeling, analysis and design tools for control and automation systems.
- Acquire the fundamentals of industrial communications.
- Drawing and interpretating plans and diagrams according to the appropriate standards and symbology.

3. Syllabus

Theoretical Contents:

1.- Internal architecture of a PLC

- RAM, ROM, ALU, PSW.
- Digital I/O.
- PAE and PAA.
- Scan cycle.

2.- PLC's Configuration and Programming

- Programming languages (KOP, AWL and FUP).
- Timers and counters.
- Arithmetic and comparison operations.
- Jumps.
- Parameterizable functions and functions.
- Data blocks and function blocks.
- Integrated functions.

3.- Analog inputs and outputs

4.- Industrial sensors and detectors

5.- Fundamentals of industrial communications and distributed control

6.- Industrial buses

Practical Contents:

1.- Process control (discrete)

- Basic industrial process simulation models.

2.- Three-phase asynchronous motor speed variation.
- Configuration and programming of commercial inverters (SIMATIC MM440).
- Three-phase asynchronous motor speed control.

4. Academic activities

Teaching will be organized according to the following guidelines:
- **Theoretical classes:** Theoretical activities taught in a fundamentally expository way by the professor, in such a way that the theoretical supports of the subject are exposed..
- **Practical classes:** The teacher exposes and helps in the use and handling of the software necessary for the configuration and programming of control devices (PLC's).
- **Laboratory practices:** Students will perform, in groups, tests, measurements, assemblies, etc., in the laboratories and following a script provided by the teacher.
- **Individual tutoring:** They will be carried out in the department, through a personalized attention to the student in order to solve the doubts and difficulties encountered by the students.

5. Assessment system

Continuous assessment system

The continuous assessment system will include the following group of gradable activities:
- Proposed practical work (complete all)
- Theoretical / practical tests

The subject will have been passed by adding 50% of the points of the different evaluation elements.

To be eligible for the Continuous Assessment system, at least 80% of the classes must be attended (lectures and laboratory practices).

Final Global Assessment Test

The student must opt for this modality when, due to their personal situation, they cannot adapt to the pace of work required in the continuous assessment system, has failed or would like to raise a grade after having participated in this methodology.

The evaluation criteria to be followed for the global assessment test system activities are as follows:
- Theoretical / practical exam 100%

6. Sustainable Development Goals

5 - Gender Equality
7 - Affordable and Clean Energy