39636 - Advanced Automation and Control Engineering

Syllabus Information

Academic year: 2024/25
Subject: 39636 - Advanced Automation and Control Engineering
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 608 -
ECTS: 6.0
Year: 4
Semester: Second semester
Subject type: Optional
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.

With the practical contents, the aim is that the student is able to manage industrial components, as well as the programming and configuration necessary to implement different controls in real processes.

- Configure, program and implement different types of PLC networks.
- Understand and operate specific software for the configuration of HMI and Scadas systems.

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.- Industrial sensors and detectors

2.- Industrial Communications (Buses)

- PROFIBUS industrial communication networks
- PROFINET industrial communication networks

3.- HMI - SCADA

Practical contents:

1.- Profibus-DP network

- PLC(s7-300) as master and ET200 as slave
- PLC(s7-300) as master and frequency converter (MM440) as slave

2.- WinccFlexible

- HMI - SCADA
- System configuration and programming SCADA in different industrial processes

3.- Motor speed control by means of frequency inverters.

- Programming and configuration stages "flexible cell".

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**: Personalized attention will be given to the student in order to solve doubts and difficulties. These tutorials can be conducted in person or virtually.

5. Assessment system

Continuous assessment system

The continuous assessment system will include two different blocks with their respective gradable activities:

1.- Individual block:

- Theoretical/practical tests.

2.- Block group:

- Proposed practical work (complete all of them).
- Projects "industrial processes".

To pass the course it will be necessary:

- Pass both blocks separately.
- The final grade will be the arithmetic mean of both.

To be eligible for the Continuous Assessment system, students must attend at least 80% of the face-to-face activities (lectures and laboratory practices) (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 their grade after having participated in this methodology.

The evaluation criteria to be followed for the global evaluation test system activities are as follows:

- Theory / Practical exam (100%)

6. Sustainable Development Goals

5 - Gender Equality
7 - Affordable and Clean Energy