

Academic Year: ( 2023 / 2024 )

Review date: 27-04-2023

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: OÑA SIMBAÑA, EDWIN DANIEL

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Industrial Automation I

**SKILLS AND LEARNING OUTCOMES**

CB1. Students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study

CB2. Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.

CB3. Students have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgements which include reflection on relevant social, scientific or ethical issues.

CB5. Students will have developed the learning skills necessary to undertake further study with a high degree of autonomy.

CG1. Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of Industrial Engineering.

CG3. Ability to design a system, component or process in the field of Industrial Technologies to meet the required specifications

CG4. Knowledge and ability to apply current legislation as well as the specifications, regulations and mandatory standards in the field of Industrial Engineering.

CG5. Adequate knowledge of the concept of company, institutional and legal framework of the company. Organisation and management of companies.

CG6. Applied knowledge of company organisation.

CG8. Knowledge and ability to apply quality principles and methods.

CG9. Knowledge and ability to apply computational and experimental tools for the analysis and quantification of Industrial Engineering problems.

RA1. Knowledge and understanding: Have basic knowledge and understanding of science, mathematics and engineering within the industrial field, as well as knowledge and understanding of Mechanics, Solid and Structural Mechanics, Thermal Engineering, Fluid Mechanics, Production Systems, Electronics and Automation, Industrial Organisation and Electrical Engineering.

RA2. Engineering Analysis: To be able to identify engineering problems within the industrial field, recognise specifications, establish different resolution methods and select the most appropriate one for their solution

RA3. Engineering Design: To be able to design industrial products that comply with the required specifications, collaborating with professionals in related technologies within multidisciplinary teams.

RA4. Research and Innovation: To be able to use appropriate methods to carry out research and make innovative contributions in the field of Industrial Engineering.

RA5. Engineering Applications: To be able to apply their knowledge and understanding to solve problems and design devices or processes in the field of industrial engineering in accordance with criteria of cost, quality, safety, efficiency and respect for the environment.

**OBJECTIVES**

- Extend the knowledge on automation of industrial systems.
- Integration of the different equipments that are included in the automated industrial system.
- Capacity of collaborative team work

## DESCRIPTION OF CONTENTS: PROGRAMME

This course has a practical character. The students automatize a real flexible manufacturing system, that includes:

- Storage and transport automated systems
- CNC machine tools
- Industrial robots
- Test systems
- Monitoring and control systems

To do that they must:

- Program the controllers
- Program the communication systems
- Coordinate the cells of the flexible manufacturing system
- Design and program a supervision system and a human-machine interface

## LEARNING ACTIVITIES AND METHODOLOGY

- Practical work in the workshop (6 credits ECTS)

## ASSESSMENT SYSTEM

Continuous assessment of the work in the workshop

Assessment of the systems developed by the student

<b>% end-of-term-examination:</b>	0
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	100

## BASIC BIBLIOGRAPHY

- Hans Berger Automating with SIMATIC S7-1500, Publicis Publishing, 2014
- Luis Peciña Belmonte Programación de controladores avanzados SIMATIC S7 1500 con Tia Portal, AWL/KOP y SCL, Marcombo, 2019