Automated production systems

Academic Year: (2019 / 2020) **Review date: 17-05-2019**

Department assigned to the subject:

Coordinating teacher: BARBER CASTAÑO, RAMON IGNACIO

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 1

OBJECTIVES

Specific competences of the subject:

1. To know the fundamentals of the automated production systems.
2. To acquire the ability to increase this knowledge and apply it to the development of information technology projects related to production processes.
3. Ability to start up and manage manufacturing processes, taking into account security aspects and the final quality of the products and their standardization.
4. Ability to coordinate works in information technology facilities, ensuring the quality of the service.
5. Ability to project, calculate, and design manufacturing processes with information technology equipment.

Learning results:

- Knowledge of the fundamentals of the automated production systems.
- Knowledge and ability to develop an information technology system for industrial monitoring.
- Knowledge of the design of automated manufacturing processes with information technology equipment.
- Knowledge of the fundamentals of information technology systems.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Fundamentals of production systems
   1.1 Production Systems. Industrial automation.
   1.2 automated machines. Robotized systems.
   1.3 Flexible Automation Systems.
   1.4 Production Resource Management

2. Material handling systems.
   2.1 Material flows.
   2.2 Identification systems.
   2.3 Automated Storage Systems.
   2.5 Automated transport systems.

3. Information management systems.
   3.1 Integrated manufacturing systems.
   3.2 SCADA systems.
   3.3 ICT industry

4. Fundamentals of industrial automation systems.
   4.1 Programmable Logic Controllers
   4.2 Modeling discrete event systems
   4.2 Automata programming

5. Industrial programming lenguajes
   5.1 Language Contacts
   5.2 robot programming languages
   5.3 Programming CNC machines

6. Production trends.
   6.1 Sustainable production.

6.2 Internet of things.

7. Case Studies
7.1 Applications of IT in renobables energy.
7.2 Computer facilities.

LEARNING ACTIVITIES AND METHODOLOGY

Master classes: Oriented to the teaching of the specific competences of the subject. The knowledge to be acquired by the students will be presented in these classes. As a support for the students, they will be given basic notes and reference books to help them to complete those subjects they are more interested in. Besides, students will have access to technical documents related to industrial automation and manufacturing processes with information technology equipment.

Practical sessions, individual or in small groups: Practical sessions will be carried out, mainly in small groups. The students will design and implement an industrial communication system. Besides, they will get familiar with computer-integrated systems, flexible cells, SCADA systems, and industrial application software.

Realization of supervised academic activities.

Personal work and study: To develop the ability to organize and plan the individual work and the learning process. It includes, among others, different exercises and complementary reading.

ASSESSMENT SYSTEM

The objective is to know the degree of knowledge of the student related to the objectives proposed. For this purpose, the work of the student will be evaluated, individually or collectively, through a continuous evaluation process that takes into account their exercises, exams, practical works, and other activities described above. The student will be continuously informed about his/her progress on these matters.

The final grade will take into account individual student activities and team activities. The activities carried out during the course, individual or group will account for 100% of the grade. The rating is broken down into:

Case study (50%)
- Practical case report (60%)
- Presentation of case study (40%)

Working in laboratory automation (50%)
- Presentation and laboratory performance (70%)
- Report (30%)

The student will have access to a extraoridnaría evaluation according to the following criteria:

If the student did not follow the continuous evaluation process, you will be entitled to take an exam in the extraoridnaría evaluation with a value of 100% of the total course grade.

% end-of-term-examination:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

BASIC BIBLIOGRAPHY

- Benhabib, Beno. Manufacturing: design, production, automation and integration, Ediciones Técnicas Izar, 2004

- REMBOLD, U., NNAJI, B.O., STORR, A. Computer Integrated Manufacturing and Engineering, Addison-Wesley, 1993