Models and Structures of IC4.0

Academic Year: (2022 / 2023) **Review date: 25-04-2023**

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: BARBER CASTAÑO, RAMON IGNACIO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

It is an introductory course to the Master, so all those admitted (according to the Master's regulations) may take it.

OBJECTIVES

BASIC COMPETENCE

CB7 That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study
CB8 That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments
CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that sustain them to specialized and non-specialized audiences in a clear and unambiguous way
CB10 That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous

GENERAL COMPETENCES
CG1 Knowledge and understanding of the theoretical foundations of both industrial processes and services, and communications.
CG2 Ability to model, identify basic requirements and analyze various processes.
CG6 Capacity to adapt to changes in requirements associated with new products, new specifications and environments.

SPECIFIC COMPETENCES

CE1 Ability to design automatic process systems (production machinery, transport and storage systems and quality control) and the interconnection between their different modules (industrial protocols)

CE3 Ability to program and simulate robot control systems at high, intermediate and low levels

CE5 Ability to know and understand the structure of networks and protocols involved in distributed applications and IoT / M2M environments

LEARNING RESULTS
After studying this subject the student will be able to:
- Identify the models and reference structures of the Connected Industry 4.0, its component parts and interconnection.
- Identify and know the industrial production technologies involved in the Connected Industry 4.0.
- Identify and know the communication protocols applied to the Connected Industry 4.0. Skills of selection, design and application of general communications and their protocols.

DESCRIPTION OF CONTENTS: PROGRAMME

Common themes of the subjects:
- Discrete and continuous systems
- Dynamic systems modelling
- Temporary and frequency responses of systems
- Fundamentals of systems programming
- Systems simulation tools

Specific themes of the subjects:

Models and structures of IC4.0:
- Definitions of CI4.0
- Main objectives of CI4.0
- Main structures of CI4.0
- Organizational models of CI4.0
- Main applications and examples of CI4.0

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40