

Academic Year: (2023 / 2024)

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Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: CASTRO GONZALEZ, ALVARO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming (course: 1, semester 1)

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.

RA6. Transversal Skills: To have the necessary skills for the practice of engineering in today's society.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to computer systems development
2. Introduction to Software Engineering (requirements, Unified-Modeling Language, and Object-Oriented analysis)
3. Object-Oriented Design
4. Object-Oriented Programming in C + +

LEARNING ACTIVITIES AND METHODOLOGY

The learning activities include:

Lectures, classes for resolution of doubts in small groups, student presentations, tutorials and individual work of students; aimed at the acquisition of knowledge.

Laboratory practices and sections of problems in small groups, individual tutorials and individual work of students, aimed at the acquisition of practical skills related to the syllabus of the subject.

ASSESSMENT SYSTEM

- | | |
|---|-----|
| % end-of-term-examination/test: | 0 |
| % of continuous assessment (assignments, laboratory, practicals...): | 100 |
- Continuous assessment: 100%.
 - o First midterm exam: 30%
 - o Second midterm exam: 30%
 - o Project: 40%.
 - Final exam:
 - o if the student follows the continuous assessment: project evaluation
 - o if the student has NOT followed the continuous assessment: 100% (he/she will take the final exam with all the content, and the final mark will be worth 60% of the mark obtained)
 - Extraordinary exam: 100% with all the content

BASIC BIBLIOGRAPHY

- Bjarne Stroustrup The C++ Programming Language, fourth Edition, Addison-Wesley, 2013
- Harvey. M. Deitel and Paul. J. Deitel C++ How to Program 2 (9th Edition: introducing the new C++11 Standard), Prentice Hall, 2011
- Joseph Schmuller Sams Teach Yourself UML in 24 Hours, Third Edition, Sams Publishing, 2004
- Stanley B. Lippman, Josée Lajoie "C++ Primer", Tercera Edición,, Addison-Wesley,, 1998

BASIC ELECTRONIC RESOURCES

- cplusplus.com . Information on the C++ language: <https://cplusplus.com/>