

66432 - Design and Development of the Industrial Process

Syllabus Information

Academic year: 2023/24

Subject: 66432 - Design and Development of the Industrial Process

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 330 - Complementos de formación Máster/Doctorado
536 - Master's in Mechanical Engineering

ECTS: 4.5

Year: 536 - Master's in Mechanical Engineering: 1

330 - Complementos de formación Máster/Doctorado: XX

Semester: Second semester

Subject type: 536 - Optional

330 - ENG/Complementos de Formación

Module:

1. General information

Objectives of the subject

The main objective of the subject is for the students to acquire the necessary skills for the application of specialized techniques in the design and development of industrial processes. Different levels are addressed, from planning based on finite elements specialized in shaping processes to the configuration of warehouses and production lines.

Firstly, it is intended that the student assimilates the appropriate work methodologies, to subsequently advance in the optimization of the problems that arise in the design and development tasks of the different industrial processes. Specialized computer techniques and applications will be used, while reviewing the state of the art in the industry and research. Each student will delve into a specific line of work, although they will be able to observe the application in the rest of the work lines by developing simple technical cases and participating in the analysis of their colleagues' work.

Sustainable Development Goals of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) : Goal 8: Objective 8.2; Goal 9: Objective 9.4; Goal 12: Objective 12.5

2. Learning results

1. To acquire skills to design and optimize manufacturing systems.
2. To know and apply the techniques of modelling and optimization of automated production lines with high flexibility requirements to specific cases of mechanical manufacturing.
3. To know and apply computational and experimental techniques for the development of solutions in mechanical manufacturing.
4. To know the optimization techniques applied to manufacturing systems.

3. Syllabus

1. Planning, simulation and optimization of manufacturing processes: technical case of stamping of metallic components.
2. Optimization and performance improvement in industrial processes: technical case of design and configuration of productive cells and lines and logistics.

4. Academic activities

Learning is based on the application of concepts and techniques in planning and optimization in different areas of design and development of industrial processes. The case method will be used in each of them. The student must focus the subject work/project on one of the areas: component formation or manufacturing line configuration.

In order to achieve this, the teacher will introduce different concepts related to the subject during the lectures. Later, in problem/practical classes, industrial practical cases will be developed, and the different types of involved technologies will be introduced. The tutored sessions will be dedicated to the evaluation, correction, and clarification of aspects of the subject project carried out by each student, with the aim of analysing possible deficiencies and solving doubts. In the case of production lines, the project will be done in a team.

- Master class and development of technical cases in group: 24 hours
- Practices and tutored sessions: 21 hours
- Work and personal study: 65 hours
- Assessment: 2.5 hours

5. Assessment system

The subject is preferably evaluated with a **continuous assessment** that consists of three blocks:

1. Practice report on the stamping of components section (25% of the grade)
2. Practice report on the design and configuration of production lines and logistics (25% of the grade).
3. Practical work/project on the part of the subject the student wants to study in depth (50% of the grade)

A minimum of 3/10 in each section is required to average the grades of the continuous assessment activities. In case of not exceeding that minimum, a global evaluation must be carried out.

Alternatively, the student has the possibility of passing the subject by means of the **global evaluation** in the official calls for exams. The evaluation is carried out through a theoretical-practical test on the dates established by the centre and a project to be developed in the official evaluation periods. These tests include all the content of the subject.