Universidad Zaragoza

Academic Year/course: 2024/25

29698 - Designing with plastics and composite materials

Syllabus Information

Academic year: 2024/25
Subject: 29698 - Designing with plastics and composite materials
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 558 - Bachelor's Degree in Industrial Design and Product Development Engineering
ECTS: 6.0
Year: 4
Semester: Second semester
Subject type: Optional
Module:

1. General information

The content of this course focuses on knowing how to integrate from the beginning the design of a component to be manufactured in plastic or composite materials, criteria as diverse as those related to materials, part design, conditioning factors of transformation processes imposed by machine or tooling, etc..... The Engineer must understand that design is a complex process in which the above aspects are correlated.

The contents are designed so that the future engineer, when designing, will be able to apply the techniques and skills needed to perform in an integral environment such as the development of plastic and composite components

In addition to technical and functional aspects, others such as economic and environmental aspects will be integrated.

2. Learning results

- Knows the design constraints imposed by the different transformation processes with plastic and composite materials
- Knows the formal design criteria of plastic pieces, being able to design objects and sets of these materials
- Knows the formal criteria of design with composite materials, being able to design objects with these materials

3. Syllabus

- Introduction to plastics and their use in industry
- Plastic materials transformation techniques.
- Redesign of plastic parts.
- Conditions of the transformation process in the design.
- Design of injected plastic parts:

-Tooling design

-Selection of plastic materials

-Defects in injected parts

-Simulation of the injection process

-Cost

-Environmental impact

- Failure criteria for plastic parts sizing
- Joining technologies for plastic parts
- Crimping and fitting joints
- Introduction to Composite Materials
- Fibres and resins
- Mat-comp manufacturing processes
- Testing and quality
- Mat-Comp calculation

4. Academic activities

The subject has 6 credits, which is equivalent to 150 hours of student work, assigned as follows: Lectures: sessions with the teacher in which the subject matter will be explained: 30 hours

Problems: 15 hours

Laboratory practices: 12 hours

Completion of deliverables and work of the subject: 37 hours

Study of the subject; class preparation; practical activities: 60 hours

Assessment tests. 3 hours

5. Assessment system

- Active participation in the practical classes, with elaboration of scripts. 10%.
- Active participation in the theoretical classes of the subject with plastic materials, with the elaboration of deliverables and work on the subject. 65%
- To develop a case, prepare a work on the subject with composite materials and present it. 25%

Following the regulations of the University of Zaragoza, a global assessment test will also be scheduled in each call, to be held on the date set by the centre, for those students who do not opt for this continuous assessment system. The test will consist of a theoretical-practical content evaluation exam that will constitute 100% of the final grade.

6. Sustainable Development Goals

4 - Quality Education
9 - Industry, Innovation and Infrastructure
12 - Responsible Production and Consumption