

## 25872 - Computer Aided Design I

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 25872 - Computer Aided Design I

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 558 - Bachelor's Degree in Industrial Design and Product Development Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

The aim of the subject is to enable students to give shape to the designed objects by generating parametric virtual models, mainly providing knowledge aimed at handling intermediate-advanced level parametric 3D CAD tools with which they will be able to develop the formal and technical definition, as well as the communicative capacity of the products. The practical and integrating application of the knowledge that has been acquired will take place through the development of works.

It will be a basic and essential training to develop their professional activity, facilitating the three-dimensional perception of the objects and allowing to complete the definition of the model designed in a progressive way, from a conceptual design to a complete and rigorous definition of the product from the technical point of view.

### 2. Learning results

In order to pass this subject, the student must demonstrate that they are able to apply the essential aspects of the creation, representation and technical definition of CAD geometric models for the formal development of a product in the environment of an industrial design project, acquiring the capacity of technical development of the product on the basis of the following aspects:

1. Ability to generate geometric models using parametric 3D CAD solid modeling tools in a formal and technical product development environment in an industrial design project.
2. Knowledge and selection of the different modeling, assembly and animation tools available for the design of virtual models and their correct integration.
3. Knowledge of the different formats and types of CAD modeling programs and their files, and possible import/export routes.
4. Critical and analytical skills based on observation, to be applied to presentations, modifications and simulations of the generated models, as well as for their subsequent application, within the context of a design methodology, to tests of various types.

### 3. Syllabus

The program to be developed in the practice sessions is as follows:

1. Introduction to the 3D Parametric Modeling environment (Week 1)
2. Modeling of parts (Week 2 to 5)
  1. Working process with sketches (creation, geometric and dimensional constraint)
  2. Operation-based parametric modeling workflow
3. Workflow in the creation and management of assemblies (Week 6 to 10)
  1. Relationships between components
  2. Top-down design in the assembly context
3. Management of standard and design component libraries.
4. Simulations of assembly operation (Week 10-15)

The program to be developed in the theory sessions is as follows:

1. Project concept in parametric modeling and its management (Week 1-2)
2. Assisted modeling of sheet metal parts. (Week 3-6)
3. Modeling strategies in parametric 3D CAD (Week 7-8)
4. Assisted Structural Modeling. (Week 9-10)
5. Creation and management of welded assemblies (Week 11-12 )
6. Techniques for importing and exporting models between applications (Week 13-14)

#### 4. Academic activities

The subject has 6 ECTS 150 hours for the student. Distributed as follows :

- 15 h. of theoretical class (15 sessions of 1 hour)
- 45 h. of practical class (15 sessions of 3 hours)
- 20 h. of theoretical study.
- 65 h. of practical work.
- 05 h. of examination and presentation of papers.

#### 5. Assessment system

The assessment will consist of a global test within the examination period, on the date established by the Center, which will consist of the following parts:

- Practical exam where the student applies the acquired knowledge to the resolution of an exercise.
- Subject work done at an individual level that must be handed in on the day of the global test and may be required to be defended.
- Module work, carried out in groups.

WORKS (50%): Minimum grade 5 points

EXAM (50%): Minimum grade 5 points

Modulo work or equivalent (10%): Minimum grade 5 points

Subject work (40%): Minimum grade 5 points

In order to consider the subject passed, the student must obtain a grade greater than or equal to 5 points out of 10 in each of the activities.

In case that in any of the parts the minimum of 5 points has not been obtained, the final grade in the call will be the minimum between these two values: 4 points or the weighted average of the three activities (module work 10%, work subject 40% and exam 50%)

Upon delivery of the papers, they will be subject to a request for presentation and possible defense if necessary.