

## 66231 - Ecodesign and life cycle analysis

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 66231 - Ecodesign and life cycle analysis

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

**Degree:** 531 - Master's in Chemical Engineering

**ECTS:** 3.0

**Year:**

**Semester:** 531-First semester o Second semester

266-Second semester

**Subject type:** Optional

**Module:**

### 1. General information

This subject aims to provide scientific and technical knowledge on the implications and requirements for sustainable development at the earliest stage of product design, taking into account all stages of the life cycle: selection of raw materials; manufacturing; transportation and distribution; installation and maintenance; use; and end of life.

The student taking this elective subject will complement the training acquired in the undergraduate subject "Environmental Engineering" (or equivalent according to the degree of origin of the master's student) and the subject "Environmental Management in Industry", a compulsory subject taught in the first semester of the master's degree, since it introduces new contents that have not been seen in either of the two aforementioned subjects.

### 2. Learning results

- To know the meaning of eco-design and its contribution to environmental sustainability, more specifically to SDG 12 "Responsible production and consumption" of the 2030 agenda.
- To know and apply the existing legal obligations and environmental standards in relation to the design of a product considering its complete life cycle.
- To design eco-efficient products (that reduce environmental impact and consumption of natural resources) considering their entire life cycle.
- To apply the life cycle assessment tool for product eco-design.
- To know the main options that exist to carry out ecological communication in relation to products.

### 3. Syllabus

Topic 1. Eco-design concept: contribution to sustainability through product design. Legal requirements in product eco-design.

Topic 2. Environmental product declaration: self-declarations and eco-labels.

Topic 3. Eco-design methodology. Tools.

Topic 4. Life Cycle Assessment (LCA): Methodology, databases, tools. Application of LCA for eco-design.

### 4. Academic activities

- **Participative master classes:** 19 hours Expository sessions of theoretical and practical content.
- **Problem and case solving classes** (7 hours). These classes are complementary to the lectures and consist of exercises, resolution of real practical cases, analysis and discussion of cases, etc.
- **Practical simulation classes** (4 hours). In them the student will learn the use of computer tools applied to Life Cycle Assessment (LCA).
- **Teaching assignments** (11 hours). Production and presentation of works and exercises, both individually or in groups.
- **Study and personal work** (31 hours).
- **Assessment tests** (3 hours)

### 5. Assessment system

The subject will be evaluated as follows:

1. Teaching assignments. It include two types:

a) Solving of exercises and practical cases (20% of the grade) The evaluation will be done through the presentation of the work in the format indicated by the teacher.

b) Academic work (45 % of the total grade) The following aspects will be taken into account in the evaluation: content, reasoning, expected results, oral presentation and written report.

2. Simulation practices (25% of the grade). An oral presentation will be made on the results obtained from the case or cases presented.

3. Direct observation on active participation in classes (10% of the grade).

Following the regulations of the University of Zaragoza, a global assessment test will also be scheduled in both calls for those students who decide to opt for this second system or who do not pass the subject by the previous system.

## **6. Sustainable Development Goals**

8 - Decent Work and Economic Growth

9 - Industry, Innovation and Infrastructure

12 - Responsible Production and Consumption