

62943 - Advanced development of product

Syllabus Information

Academic year: 2023/24

Subject: 62943 - Advanced development of product

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 562 - Master's in Product Development Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The subject goes deeper into the analysis of the manufacturability and assembly of mechanical products through the review of technical and economic recommendations and the knowledge of advanced tools for the validation of production processes. This analysis should be developed in concurrent engineering environments, so that the entire life cycle of the product, including sustainability and recyclability aspects, is considered in the product design and development stage.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) specifically, the learning activities planned in this subject will contribute to the achievement of Objective 7.2 of Goal 7, Objective 8.4 of Goal 8, Objective 9.4 of Goal 9, Objective 11.6 of Goal 11, Objectives 12.2, 12.4, 12.5 and 12.8 of Goal 12 and Objective 13.3 of Goal 13.

Knowledge of manufacturing processes and building of mechanical assemblies is recommended.

2. Learning results

- To know and apply the concurrent engineering criteria. -To acquire practical skills on digital manufacturing and PLM technologies.
- To know and apply design for manufacturability and assembly (DFMA). -To apply design rules for different manufacturing processes and different product architectures.
- To assimilate technological and economic criteria for the optimization of design for assembly, repairability, packaging and transportation/distribution.
- To know CAD/CAM/CAE tools for modeling and simulation in manufacturing engineering in an integrated product and process development environment.
- To acquire capabilities for design optimization in sustainable production.

3. Syllabus

Program of theoretical and practical classes

Design for assembly. (DFA)

- a. Design and assembly.
- b. Guidelines and methodologies

2. Design for manufacturing. (DFM)

- a. DFM. Design guides.
- b. Digital manufacturing applications for planning and optimization of manufacturing processes.

3. Sustainable design and ecodesign

- a. Design criteria with recyclability and end-of-life in mind.
- b. Environmental impact assessment methods, life cycle analysis and sustainability of production processes.
- c. Selection criteria for sustainable processes

Practical sessions

1. Assessment of assembly processes
2. Adequacy of mechanical CAD for the implementation of design guidelines.
- 3- Valuation of manufacturing processes using digital manufacturing applications.
- 4- Analysis of product recyclability.
- 5- Assessment of the sustainability of production processes.

4. Academic activities

The subject has 6 credits, which is equivalent to 150 hours of student work, assigned as follows:

Theoretical class. Solving problems and cases 41 hours

Practical exercises 15 hours

Visits / seminars 4 hours

Study and practical application work 80 hours

Personalized tutoring teacher-student 5 hours
Assessment tests 5 hours

5. Assessment system

The subject is eminently practical and is evaluated on a continuous basis, mainly through the monitoring of the student's activities and practical work. Continuous assessment is distributed as follows:

60% practical work (including presentation of the same to the class)
20% continuous assessment of the use of the practical sessions.
20% Theoretical-practical assessment, by means of an exam.

In order to pass the subject, a minimum grade of 4 out of 10 is required in each of the practical works, practice reports and subject control. The ADD (anillo digital docente) details the weight of the specific activities in each subject block (DFM, DFA, Recyclability and eco-design), respecting the above distribution.

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 center, for those students who do not opt for this continuous assessment system. The test will be structured in a similar way with a 20% theoretical-practical evaluation in a written exercise and an 80% evaluation of the practical application of the methodologies and tools used during the term.