

DEGREE IN INDUSTRIAL DESIGN ENGINEERING

SUBJECT TEACHING PLAN INDUSTRIAL PROCESSES

ACADEMIC YEAR: 2025-26
COURSE: 2nd
CHARACTER: Mandatory
SEMESTER: 3rd
ECTS: 6
TEACHING HOURS: 49
HOURS OF SELF-EMPLOYMENT: 101
TOTAL HOURS: 150
LANGUAGE/S: English
CODE: 17045

TEACHING TEAM: Francesc Mestres fmestres@elisava.net

PRESENTATION SUBJECT / OBJECTIVES

The subject reviews the categories of industrial manufacturing and assembly processes focused on the design of industrial products. On this way, the subject introduces the reverse engineering methodology to understand the different industrial processes and improve on prototyping to view the feasibilities for product industrialization. The scope ranges from conventional manufacturing processes, to new technologies and new industry. Industrial processes is a course to introduce the most important industrial processes for different materials ways of transformation. From machining and molding to injection, cold forming and 3D printing technologies. The objectives are to delve into the technological aspects of the design and development process of a product, and introduce the student to the technical decisions of a product, defining the materials that compose it and the manufacturing processes intrinsic to this process.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)

This subject does not specifically incorporate any SDG.

CONTENTS

Block-1: Prototyping for industrial processes

- 1.1 Techniques and materials for prototyping
- 1.2 Tools for prototyping (workshop lab)
- 1.3 Technical documentation for prototyping (dossier of prototyping)

Block-2: Manufacturing processes for industrial design

- 2.1 Reverse engineering methodology: product and processes autopsy
- 2.2 Manufacturing processes categorization: From milling to additive manufacturing
 - 2.2.1 Cut from solid (machining, turning, jiggering,...)
 - 2.2.2 Sheet processes (die cutting, spinning, thermoforming,...)
 - 2.2.3 Continuous manufacturing (extrusion, blown film,...)
 - 2.2.4 Thin and hollow (blowing, rotational molding, hydroforming,...)
 - 2.2.5 Into solid (sintering, powder forming,...)
 - 2.2.6 Complex processes (molding and casting)
 - 2.2.7 Advanced manufacturing (additive manufacturing)
- 2.3 Joints and assemblies: welding, screws, adhesives, overmolding,...
- 2.4 Surface finishes and treatments: appearances and surface protection.
- 2.5 Technical documentation for industrialization

TEACHING METHODOLOGIES

- Work sessions with the entire class group with the teacher. (PA)
- Autonomous group work (PF) sessions

COMPETENCES

- G1 - Develop a creative attitude of experimentation, under scientific and humanistic criteria, that favors the exploration of relevant and innovative contributions.
- G2 - Configure new realities to interpret the historical, social, cultural, economic and technological context.
- CB3 - That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific or ethical issues

- CB5 - That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy
- T1 - Act with critical spirit and reflection before knowledge in all its dimensions, showing intellectual, cultural and scientific concern and commitment to rigor and quality in professional demand.
- T5 - Exercise active citizenship and individual responsibility with commitment to democratic values, sustainability and universal design, based on practices based on learning, service and social inclusion.
- T7 - To become the main actor of the training process itself in view of a personal and professional improvement and the acquisition of an integral formation that allows learning and living in a context respectful of linguistic diversity, with diverse social, cultural, gender and economic realities.
- E1 - Integrate the fundamentals of materials science and technology for the proper characterization, selection and application of the properties, mechanical structures and manufacturing systems of materials.
- E8 - Solve technical problems in a creative way in the fields of industrial design engineering to respond to new situations.
- E9 - Recognize scientific methods to integrate research sources into decision-making.

LEARNING OUTCOMES

- Collects and interprets data and information on which to base its conclusions, including reflections on social, scientific or ethical issues in the field of materials.
- Communicates to all types of audiences (specialized or not) in a clear and precise way knowledge, methodology, ideas, problems and solutions.
- Evaluates in a global way the learning processes carried out according to the plans and objectives set and establishes individual improvement measures.
- Shows skills for the analysis of situations from a global and integral perspective by linking social, cultural, economic and gender elements, as appropriate.
- Correctly selects and characterizes the materials to be projected with technological criteria.
- Properly applies knowledge of materials, technologies and transformation processes to product development.
- Integrates research sources into decision-making

TRAINING ACTIVITIES

Each subject will present at the beginning of the course its WORK PLAN where the didactic activities per week / session / autonomous work are recorded.

EVALUATION

EVALUATION SYSTEMS

The evaluation of the subject will be based on a continuous monitoring of the academic work of the student throughout the course.

EVALUATION SYSTEM	FINAL WEIGHTING
P2-Monitoring of the work done	10
P4-Specific assessment tests: exams	40
P5-Carrying out of required works or projects	50

EVALUATION CRITERIA

The final grade of the subject will be the weighted average of the grades of the evaluable activities according to the following table

EVALUABLE ACTIVITY	WEIGHT	RECOVERABLE (up to 50%)	EVALUATION SYSTEM
Activity-1 Class participation	10%	NO	P-2
Activity-2 Industrial processes projects and presentation	30%	NO	P-5
Activity-3 Individual contributions to the project	20%	YES*	P-5
Activity-4 Final exam	40%	YES*	P-4**

Students will have the option of re-examining themselves for recoverable tests. The recovery tests will be carried out in the period of the semester destined to this function, not being able to recover more than 50% of the subject.

* In the event that the Recoverable Evaluable Activities exceed 50%, the student may choose, up to a limit of 50%.

The unjustified non-presentation of any evaluable activity implies a grade of 0, even if the activity has been qualified as Recoverable.

The Recoverable Activities can only be subject to recovery when they have been delivered by the student on the indicated date and with a grade equal to or greater than 3.

If you renounce access to the recovery test, the grade achieved in the first instance will be maintained.

In case of presenting to recovery, the note obtained will be the last, even if it is less than the first.

** In order to calculate the final grade for the subject, it will be necessary to obtain a minimum grade of 4 in the weighted average of the exams (P-4 assessment system).

Plagiarism or copying someone else's work is penalized in all universities and, according to the Rules of Coexistence of the University of Vic-Central University of Catalonia, they constitute serious or very serious offenses. That is why during the course of this subject any indication of plagiarism or misappropriation of other people's texts or ideas ([What is considered plagiarism?](#)) as well as the improper or undeclared use of Artificial Intelligence in an activity, will result automatically in failure of the subject and/or other disciplinary measures ([Norms of Coexistence of the University of Vic-Central University of Catalonia](#)).

For any questions or queries, see the ([Academic Regulations for the Degree of the Elisava Faculty of Design and Engineering UVic-UCC](#)).

BIBLIOGRAPHY AND DIDACTIC RESOURCES

- Groover, Mikell P. *Fundamentals of modern manufacturing: materials, processes, and systems*. 7.^a ed. Hoboken, NJ: Wiley, 2020. ISBN 978-1-119-63396-9
- Hall Grimsson, Bjarki; MISRAHI VALLÉS, Alicia. *Diseño de producto: maquetas y prototipos*. 1.^a ed. Barcelona: Promopress, 2016. 190 p. ISBN 978-84-92810-52-9
- Leferti, Chris. *Making it: manufacturing techniques for product design*. 3.^a ed. London: Laurence King Publishing, 2019. 312 p. ISBN 978-1-78627-327-7

The teaching staff will provide a specific bibliography at the beginning of the subject, if applicable.