

DEGREE IN INDUSTRIAL DESIGN ENGINEERING

TEACHING PLAN OF SUBJECT MATERIALS PROJECT

ACADEMIC YEAR: 2025-26

YEAR: 3º

CHARACTER: Optional

SEMESTER: 5th

ECTS: 12

TEACHING HOURS: 90

HOURS OF SELF-EMPLOYMENT: 210

TOTAL HOURS: 300

LANGUAGE/S: English

CODE: 17063

TEACHING TEAM: Francesc Mestres fmestres@elisava.net / Anna del Corral adcorral@elisava.net

PRESENTATION SUBJECT / OBJECTIVES

The subject of Materials Project integrates the topics treated in the other subjects of the mention in Design and Materials to carry out the design and development of a product based on one or several advanced bio-materials.

For the current academic year the scope of the Materials Project will be the Packaging sector. This sector has been chosen because it is very important in Catalan industry, accounting for 2.64 % of the Gross Domestic Product of Catalonia.

In the context of the Packaging sector, the subject aims to provide students with the knowledge and tools necessary to carry out a complete design process of a container and / or packaging from one or more new bio-material is:

- Understand the problem to be solved, analyze the environment of a packaging and who will be its user, to generate ideas within the frame of reference of its scenario, define briefings, conceptualize the packaging, and develop communication elements.
- Select the most suitable locking and joint systems. With this objective it is necessary to transmit to the student the applications and singularities of a wide range of closure and dosing systems of containers.
- Define the industrialization cycle of a product, from the conception of the packaging to its passage through the logistics distribution circuit, and aim to and solve the closure of the product life cycle.
- Formalize the proposal of packaging or packaging with a functional prototype that integrates the study material or materials.
- Work on communication, both of the product developed and of the process followed in its conception.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)

This subject does not specifically incorporate any SDG.

CONTENTS

Block-1: Bio-material technology in packaging design

- Technical, formal and functional requirements for packaging design
- Exploring materials compatibility
- Transformation and decoration processes
- Hermeticity systems suitable for different materials
- Control of quality

Block-2: Global packaging project

- User Study (inclusivity)
- Scenarios
- Ideation of concepts with different material specific processes
- Solve the rejection and return to the packaging environment (circularity)
- Technical constraints of the packaging solution
- Conditioning factors of the manufacturing process
- Constraints of storage and distribution logistics
- Product communication

Block-3: Construction of working models and final models

- Prototyping of working models (CAD and physical models)
- Packaging layout for different materials
- Final product layout

TEACHING METHODOLOGIES

- Work sessions with the whole class group with the teacher (PA)
- Work sessions in small groups with the teacher (PB)
- Autonomous group work sessions (FP)

COMPETENCES

- G3 - Integrate formal sensitivity as a fundamental part of the project process.
- CB2 - The student knows how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study
- CB4 - The student can transmit information, ideas, problems and solutions to both specialized and non-specialized audiences
- T2 - Project the values of entrepreneurship and innovation in the exercise of the academic and professional personal trajectory through contact with different realities of practice and motivation towards professional development.
- T4 - Show skills for professional practice in multidisciplinary and complex environments, in coordination with networking teams, either in face-to-face or virtual environments, through the computer and informational use of ICT.
- T6 - Use different forms of communication, both oral and written or audiovisual, in one's own language and in foreign languages, with a high degree of correctness in use, form and content.
- 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.
- E7 - Develop prototypes for experimentation and formal and technical testing that allow the communication of the concept and the technical justification of the project.
- E10 - Understand the present industrial reality to function in the professional environment.
- E11 - Identify emerging technologies that can add value to the project.

LEARNING OUTCOMES

- Solves problems and situations of professional performance with entrepreneurial and innovative attitudes
- Know the basics of advanced materials; as well as the technologies involved.
- It uses different methodologies, and technological combinations with materials in the context of product, system or service design to offer an innovative and competent solution to a given problem.
- It identifies new emerging technologies in the field of materials and can abstract processes to include them in a project.

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 student's academic work throughout the course.

EVALUATION SYSTEM	FINAL WEIGHTING
P2-Follow-up of the work done	30
P3-Reports from the students themselves, external tutors, court	15
P5-Realization of required works or projects	55

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 Follow-up of weekly activities	20%	NO	P-2
Activity-3 Oral argumentative presentations	15%	NO	P-3
Activity-4 Prototype of the subject project	20%	YES*	P-5
Activity-5 Presentation of the subject project	15%	NO	P-5

Activity-6 Communication of the technical report	20%	YES*	P-5
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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.

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 TEACHING RESOURCES

- Alves, K. A. 2019. *Nanomaterials for eco-friendly applications*. Springer International Publishing.
- Behera, A. 2022. *Advanced materials: An introduction to modern materials science*. Springer.
- Charter, Martin, ed. 2019. *Designing for the circular economy*. London: Routledge. 363.7 CIR
- Nazir, R. 2019. *Nanotechnology applications in environmental engineering*. IGI Global.
- Ribeiro, C. M. Â. P., Lagarón, J. M., Pastrana, C. L. M., & Vicente, A. A. 2018. *Nanomaterials for food packaging: Materials, Processing Technologies and safety issues*. Elsevier.
- Shabbir, M., Ahmed, S., & Sheikh, J. N. (n.d.). *Frontiers of Textile Materials Polymers, nanomaterials, enzymes, and advanced modification techniques*. Scrivener publishing.
- Tanzi, M. C., Farè, S., & Candiani, G. 2019. *Foundations of Biomaterials Engineering*. Academic Press, an imprint of Elsevier.

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