BACHELOR'S DEGREE IN INDUSTRIAL DESIGN ENGINEERING

SYLLABUS
DEVELOPMENT AND SUSTAINABILITY PROJECT

ACADEMIC YEAR: 2026-27
YEAR: 2nd
CHARACTER: Compulsory
SEMESTER: 4th
ECTS: 6
TEACHING HOURS: 49
HOURS OF SELF-EMPLOYMENT: 101
TOTAL HOURS: 150
LANGUAGE/S: Spanish/Catalan
CODE: 17050

TEACHING TEAM: Adrià Arnaste aarnaste@elisava.net / Jessica Fernández jfernandez@elisava.net

PRESENTATION OF SUBJECT / OBJECTIVES

This subject introduces industrial ecology projects through the application of the life cycle analysis methodology applied to an existing product, system and/or service. The objective is to learn how to use environmental improvement tools to make decisions throughout the design or redesign process that guarantee the minimum environmental impact of the product, system and/or service under study. Students must develop the relevant technical documentation in accordance with current methodologies and regulations.

SUSTAINABLE DEVELOPMENT GOALS (SDGS)

This subject specifically incorporates the following SDG and its target:
Goal 12: Responsible consumption and production.12.6 Encourage enterprises, especially large corporations and transnational corporations, to adopt sustainable practices and incorporate sustainability information into their reporting cycle.

CONTENTS

Block-I: Introduction to LCA
1.1. Methodology and Impact Categories.
1.2. Objective, Scope of the study and Inventory
1.3. Functional unity and reference flows
1.4. Environmental impact calculation

Block-II: Development of proposals for environmental improvement
2.1. Design Research
2.2. Value Proposition and ideation
2.3. Environmental validation of initial improvement proposals
2.4. Implementation and technical resolution of the project.

TEACHING METHODOLOGIES

- Work sessions with the whole group class with the teacher (PA)
- Individual Autonomous Work (EP) Sessions
- Autonomous Group Work (PF) Sessions

COMPETENCIES

- G1 - Develop a creative attitude of experimentation, under scientific and humanistic criteria, which favours the exploration of relevant and innovative contributions.
- CB3 - Students must have the ability to gather and interpret relevant data (usually within their area of study) in order to make judgments that include reflection on relevant social, scientific or ethical issues
- CB4 - Students are able to transmit information, ideas, problems and solutions to both a specialised and non-specialised audience

- T2 - Project the values of entrepreneurship and innovation in the exercise of the personal, academic and professional trajectory, through contact with different realities of practice and with motivation towards professional development.
- T5 - Exercise active citizenship and individual responsibility with a commitment to democratic values, sustainability and universal design, based on practices based on learning, service and social inclusion.
- T6 - Use different forms of communication, both oral and written or audiovisual, in their own language and in foreign languages, with a high degree of correctness in use, form and content.
- E6 - Use different methodologies and work tools to correctly design any product, system or service.
- E7 - Develop prototypes for experimentation and formal and technical testing that allow the communication of the concept and technical justification of the project.
- E9 - Recognize scientific methods to integrate research sources into decision-making.

LEARNING OUTCOMES

- Collects and interprets data and information on which to base their conclusions, including reflections on environmental, social, scientific or historical issues in the field of design.
- Solves problems and situations typical of professional performance with entrepreneurial and innovative attitudes.

TRAINING ACTIVITIES

The 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 continuous monitoring of the student's academic work throughout the course.

EVALUATION SYSTEM	FINAL WEIGHTING
P2-Follow-up of the work done	30
P4-Specific assessment tests: exams	0
P5-Completion of required work or projects	70

EVALUATION CRITERIA

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

ASSESSABLE ACTIVITY	WEIGHT	RETRIEVABLE (up to 50%)	EVALUATION SYSTEM
Activity-0 Weekly Class Presentations	30%	NO	P-2
Activity-1 Environmental report	35%	YES*	P-5
Activity-2 Technical report on product development	35%	YES*	P-5

Students will have the option of retaking the retake tests. The retake tests will be carried out in the period of the semester allocated to this function, not being able to recover more than 50% of the subject.
* If the Recoverable Assessable Activities exceed 50%, the student body may choose, up to a limit of 50%.
The unjustified non-submission of any assessable activity implies a grade of 0, even if the activity has been classified as Recoverable.
Recoverable Activities can only be recovered when they have been submitted by the student body on the indicated date and with a grade equal to or greater than 3.
If access to the retake test is waived, the grade achieved in the first instance will be maintained.
In case of taking the recovery, the grade obtained will be the last, even if it is lower than the first.
Plagiarism or copying someone else's work is penalised 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 offences. That is why in the course of this subject any indication of plagiarism or misappropriation of texts or ideas of other people (What is considered plagiarism?) as well as the improper or undeclared use of Artificial Intelligence in an activity, automatically translates into a failure and/or other disciplinary measures (Normes de Convivencia de la Universitat de Vic-Universitat Central de Catalunya).
For any questions or queries, see the (Academic Regulations of the Bachelor's Degree of the Faculty of Design and Engineering Elisava UVic-UCC).

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BIBLIOGRAPHY AND TEACHING RESOURCES

Básica:

- Braungart, M., Mcdonough, W. 2005. *Cradle to Cradle. Rediseñando la forma en que hacemos las cosas.* Ed. McGraw Hill.
- Brown, Tim 2009. *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation* (1st ed.). Editorial Harper Collins Books.
- Capuz Rizo, S.; Gómez Navarro, T. Ecodiseño. Ingeniería del ciclo de vida para el desarrollo de productos sostenibles. Universidad Politécnica de Valencia.
- C.A. Bakker, M.C. den Hollander E. van Hinte , Y. Zijlstra. 2014. *Products that last. Product design for circular business models*. ISBN 9461863861 112 p . TU Delft Library.
- Climate NASA. https://climate.nasa.gov/
- Croney, J. 1978. *Antropometría para diseñadores.* Barcelona: Gustavo Gili.
- Lockwood, Thomas 2009. *Design Thinking: Integrating Innovation, Customer Experience, and Brand Value* (1st ed). Edited by Design Management Institute.
- Moreno M, De los Rios C, Rowe Z, Charnley F. 2016. A Conceptual Framework for Circular Design. *Sustainability. 8*(9):937. doi:10.3390/su8090937.
- Our World in data. https://ourworldindata.org/
- Papanek, Victor. 2014. *Diseñar para el mundo real.*
- Thanatia. 2021. Los límites minerales del planeta. Adrián Almazán entrevista a Antonio Valero Capilla y Unep 2004. *¿Por qué adoptar un enfoque de ciclo de vida?* United Nations Environment Programme.
- World Commission on Environment and Development. “Our Common future”. United Nations (UN).

Complementaria:

- Bürdek, B. E. 1994. *Historia, teoría y práctica del diseño industrial.* Barcelona: Gustavo Gili.
- Crull, M y Diehl, J. *Design for Sustainability. A practical approach for Developing economies.* UNEP-TU Delft
- Fernández Duran, R. *El antropoceno: la expansión del capitalismo global choca con la biosfera*. Ed. La Llevir, S. L. Virus Editorial
- Ihobe. 2010. *Guías sectoriales de ecodiseño.* Ihobe, empresa pública de gestión ambiental.
- Ihobe. 2010. *Etiquetado ambiental de producto.* Ihobe, empresa pública de gestión ambiental.
- Ihobe. 2011. *44 Casos prácticos de ecodiseño.* Ihobe, empresa pública de gestión ambiental.
- Innovator's DNA: *Mastering the Five Skills of Disruptive Innovators* (1st ed). Edited by Harvard Business School Press.
- Kelley, Tom with Littman, Jonathan. 2005. *The Ten Faces of Innovation: IDEO's Strategies for Defeating the Devil's Advocate and Driving Creativity Throughout Your Organization* (1st ed). Edited by doubleday.
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- Mootee, Idris. 2014. *Design Thinking para la innovación estratégica*. 1ª ed. Editorial Empresa Activa. ISBN-10: 8492921064
- Neufert, E. 1975. *Arte de proyectar en arquitectura.* Gustavo Gili
- Sanyé-Mengual, E. et al., 2014. Introduction to the Eco-Design Methodology and the Role of Product Carbon Footprint. In S. Muthu, ed. *Assessment of Carbon Footprint in Different Industrial Sectors*, Volume 1. Singapore: Springer Singapore, pp. 1–24.

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