

COURSE GUIDE

2025/26

Faculty

345 - Faculty of Engineering - Bilbao

Cycle

Degree

DIPRO13a - Master in Project Management

Year

COURSE

504911 - Ecodesign and Circular Economy

Credits, ECTS: 3

COURSE DESCRIPTION

The circular economy is presented as a viable alternative to the linear economic system that currently prevails. The fact of having a finite world, with its finite resources, creates the need to adopt a sustainable economic system where the most sustainable processes must be prioritized.

In this context, by keeping resources within closed cycles for as long as possible, the circular economy seeks economic growth in a sustainable manner. It is at the product design stage that up to 80% of the impact of a product throughout its life is determined, since the decisions taken here have a very marked effect on the rest of the subsequent stages.

Thus, the various eco-design strategies should seek to facilitate product management and the efficient use of resources throughout its useful life. To this end, various regulations and technical specifications have recently been introduced whose main objective is the environmental improvement of the product over the product/service to be provided. Among them, it is worth mentioning the so-called "European Green Deal", through which the European Commission seeks to achieve the goal of making Europe climate-neutral by 2050. This package of measures includes a detailed circular economy plan. In the same direction, the Basque Government recently approved the Euskadi Circular Economy Strategy 2030, which shows the involvement of public institutions in the Circular Economy.

Throughout this course, the relevance of eco-design in the circular economy will be shown, identifying from the moment a product/service is projected, the various environmental impacts associated throughout its life cycle, with the aim of reducing them as far as possible, always without detriment to their quality / applications. The relevance of "Design for R" and "biomimetics" to be able to eco-design products and services will be highlighted. Possibilities of business model changes (such as servitization) that favor a circular economy will also be shown.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

COMPETENCIAS DE LA ASIGNATURA

- Apply the theories of product design and its life cycle
- To apply the tools and techniques used for the sustainable management of projects

RESULTADOS DE APRENDIZAJE DE LA ASIGNATURA

LEARNING OUTCOMES OF THE COURSE

At the end of the course, the learning outcomes can be classified into:

Knowledge

- Identifies key aspects when designing an environmentally sustainable product or service.
- Knows the life cycle of a product or service.
- Measures the environmental impacts of a product or service.

Skills

- Solves specific re-design problems in the framework of the Circular Economy.
- Shows autonomy for research on environmental impacts of products and services of diverse nature.
- Suggests solutions to integrate various disciplines in the design of products and services.
- Designs taking into account engineering, environmental and social sustainability aspects.

Competences

- Is able to manage a group dedicated to the sustainable design of products and services.
- Monitors the process of integrating environmental legislation in the company/organization.
- Leads a group to create new legislation on sustainability of products and services.

Theoretical and Practical Contents

- Taking into account the objectives and competences that students should acquire by taking this subject, and that in the previous subjects there will be a brief introduction to the subject ('butterfly diagram'...), we propose a division of the theoretical content into the following topics:
- 1 Basic principles and implications of Ecodesign: Introduction to the concept of design and ecodesign. Product life cycle. Conceptual introduction to Life Cycle Assessment (LCA). Product trends and implications. Examples. Exercises.
 - 2 Design for a Circular Economy: Design for R; reuse, repair, remanufacture, recycle. Questions. Exercises.
 - 3 Biomimicry: Brief introduction. Examples. Levels.
 - 4 Ecodesign Standardization: Definitions. European Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products. End-of-life vehicles (ELVs); plastics and packaging. Waste electrical and electronic equipment (WEEE). New measures such as M/543. Patents.
 - 5 Ecodesign and business: Integration of Ecodesign in business management systems. Application of the principles of the

international standard ISO 14006:2020 "Environmental management systems. Guidelines for the incorporation of ecodesign". Introduction to Life Cycle Analysis (LCA). Consumer communication mechanisms: Environmental Product Declarations (EPD), Product Environmental Footprint (PEF), Organization Environmental Footprint (OEF), Single-vector footprints. Examples. Benefits.

6 Ecodesign and business: Servitization. Implementation of new business models based on product-service systems, as a strategy to promote the Circular Economy. Applicable services. Sustainability / environmental impact. Examples.

METODOLOGIA (ACTIVIDADES FORMATIVAS)

Actividad Formativa	Hours	Porcentaje presencialidad
Groupwork	20	10 %
Exercises	25	10 %
Expositive classes	30	33 %

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	10		10		10				
Horas de Actividad No Presencial del Alumno/a	10		25		10				

Legend: M: Lecture-based S: Seminar GA: Applied classroom-based groups
GL: Applied laboratory-based groups GO: Applied computer-based groups GCL: Applied clinical-based groups
TA: Workshop TI: Industrial workshop GCA: Applied fieldwork groups

Evaluation tools and percentages of final mark

Denominación	Ponderación mínima	Ponderación máxima
Attendance and participation	10 %	30 %
Written examination	15 %	35 %
Presentations	25 %	45 %
Practical tasks	30 %	50 %

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The assessment of the subject is carried out continuously throughout the course. The following factors are taken into account in the grading of the course:

• Attendance and participation (20%): Although attendance is not compulsory, it is highly recommended due to the contents developed in the classroom. For this reason, attendance forms part of the calculation of the final grade.

• Team work (groups of 2) (40%): At the beginning of the course, students will be assigned to work teams of 2 people. Teamwork in this class is considered very relevant and therefore has a significant importance in the evaluation of the students. Each team must deliver a designated paper at the beginning of the course. The work will be presented orally on the last day of the course in Power Point format, and will be shared with the rest of the students. In order to pass the course, the work must have obtained a grade higher than 5 out of 10.

• Exam (40%): As in the certification exams of the professional associations of project management, the exam will be in the form of a multiple-choice test. In order to pass the course, the work must have obtained a grade of more than 4 out of 10.

- The grade for the course will be obtained by applying the corresponding weight to each of the factors (attendance, team work and exam).
- If any of the work has not passed the established cut-off mark, the final mark for the course will be No Show.
- If the exam mark is lower than 4.0, the final mark for the course will be that corresponding to the exam mark.
- If the student decides to waive the Continuous Assessment of this subject, he/she must communicate it in writing before the deadline for the submission of the individual work. This date can be found in the Student Guide available on the eGela platform.

In this case, in order to pass the course, the student will be assessed by means of a written exam that may contain additional questions to those posed in the exam to which students who are assessed on a continuous basis are submitted and which will include all the contents studied throughout the four-month period corresponding to the exam. This assessment will be completed with an oral exam which will take place on the same day as the written exam, by prior appointment for students registered for this exam. In the oral exam, students will be asked about the contents studied in the classroom, as well as about the activities carried out during the corresponding four-month period. In order to pass the course, students must pass both tests.

In the event that health conditions prevent the completion of a teaching activity and/or face-to-face assessment, a non-face-to-face modality will be activated, of which students will be promptly informed (applicable to all exams: ordinary, extraordinary and advance).



EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

Those who have to sit the extraordinary call will do so in the same way as they did in the ordinary call. In other words, those who took the continuous assessment will complete the tests (team work and exam) that they did not pass in the ordinary call.

The grade for the course will be obtained by applying the corresponding weight to each of the factors (attendance, team work and exam).

If any of the work (individual or team work) has not passed the established cut-off mark, the final mark for the course will be No Show.

If the exam mark is lower than 4.0, the final mark for the course will be that corresponding to the exam mark.

Those who waive the continuous assessment will be submitted to a written and oral exam as described in the previous section (Ordinary call: orientations and waiver).

MANDATORY MATERIALS

The teaching material necessary for the follow-up of the subject will be provided by the teachers during the course, through the virtual platform eGela (<https://egela.ehu.eus/>) corresponding to this subject.

This material includes the regulations governing the subject, the content of the subject, the audiovisual material used by the teaching staff and the guide of the activities to be carried out.

In addition to this teaching material, links to complementary information sources will be provided, in order to complement and deepen the aspects developed during the different thematic blocks.

BIBLIOGRAPHY

Basic bibliography

- ISO 14006:2020 Environmental management systems — Guidelines for incorporating ecodesign: <https://www.iso.org/standard/72644.html>.
- The European Green Deal - Plan de Acción de Economía Circular: https://ec.europa.eu/commission/presscorner/detail/es/ip_20_420
- Basque Ecodesign Center (2013). Product Service Systems: ¿Qué pueden aportar a mi negocio? Cuaderno de Ideas nº1. Edita: Eusko Jaurlaritza /Gobierno Vasco
- Basque Ecodesign Center (2016). Ecodiseño para una Economía circular: Claves para fomentar un modelo económico sostenible. Cuaderno de Ideas nº13. Edita: Eusko Jaurlaritza / Gobierno Vasco.
- Comisión Europea (2014). Hacia una economía circular: un programa de cero residuos para Europa: SWD 206 final y SWD 211 final. Disponible en: <https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=celex%3A52014DC0398>

Detailed bibliography

- Guías sectoriales de Ecodiseño (Ihobe): <http://www.ihobe.eus/publicaciones/guias-sectoriales-ecodiseno>
- Comisión europea (2001). Libro verde sobre la política de productos integrada. COM (2001) 68 final. Disponible en: <https://eur-lex.europa.eu/legal-content/ES/ALL/?uri=CELEX:52001DC0068>
- PRé Consultants, Mark Goedkoop, Michiel Oeie (2000). Eco-indicator 99 methodology report.
- PRé Consultants, Mark Goedkoop, Michiel Oeie (2001). User Manual Introduction into LCA methodology and practice with SimaPro 5.
- Rodrigo, J., Castells, F. (2002). Electrical and Electronic Practical Ecodesign Guide. Edita: Universidad Rovira i Virgili.
- Sociedad Pública de Gestión Ambiental —IHOBE (2000). Manual Práctico de Ecodiseño. Operativa de Implantación en 7 pasos. Edita: Departamento de Ordenación del Territorio, Vivienda y Medio Ambiente, Gobierno Vasco.

Journals

- International Journal of Sustainable Design
- Journal of Cleaner Production
- Journal of Industrial Ecology
- Resources, Conservation and Recycling
- Sustainability
- ACS Sustainable Chemistry and Engineering
- Nature Sustainability

Web sites of interest

- The Circular Economy Foundation: http://economyacircular.org/EN/?page_id=62
- AENOR Gestión del Ecodiseño ISO 14006: <https://www.aenor.com/certificacion/medio-ambiente/ecodiseno>
- Ihobe: <https://www.ihobe.eus/inicio>
- Basque Ecodesign Center: <http://www.basqueecodesigncenter.net/Default.aspx?IdMenu=20552758-7739-4933-b86f-8a063bb65abc&Idioma=es-ES>