



FICHA TÉCNICA DE LA ASIGNATURA

Datos de la asignatura	
Nombre completo	LCA and Footprints
Código	DIM-MEET-556
Créditos	3,0 ECTS
Carácter	Obligatoria
Departamento / Área	Departamento de Ingeniería Mecánica

Datos del profesorado	
Profesor	
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Profesor	
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DATOS ESPECÍFICOS DE LA ASIGNATURA

Contextualización de la asignatura
Aportación al perfil profesional de la titulación
<p>This course aims to deepen the knowledge of the methodology of life cycle assessment (LCA), environmental impacts and the use of footprints as a form of measurement.</p> <p>The knowledge acquired in this subject serves as the basis for the professional career of the engineer in the field of environment and energy management.</p> <p>At the end of the course, the student will know the methodology of LCA and fingerprints in depth, will be able to carry out complete evaluations of any product or service, focusing on the critical aspects necessary to achieve robust results.</p> <p>The training will be complemented with learning how to use the Simapro tool for performing LCAs, acquiring skills for the modeling of complex processes and obtaining adequate results and interpretation of them.</p>
Prerrequisitos
There are no specific prerequisites.

Competencias - Objetivos



BLOQUES TEMÁTICOS Y CONTENIDOS

Contenidos – Bloques Temáticos

Unit 1: Life Cycle Assessment

- Introduction and brief history of stroke
- Definition of objective and scope
- Inventory Analysis
- Life Cycle Impact Assessment
- Interpretation and presentation of results

Unit 2: Applications of Life Cycle Assessment

- Ecodesign
- Green Marketing (Ecolabels)

Unit 3: Sustainable Life Cycle Analysis

- Life Cycle Cost Analysis
- Social Life Cycle Analysis
- Sustainable Life Cycle Analysis

Unit 4: Footprints

- Carbon Footprint. Concept, Standards, Strategic Approach in Corporations: "Decarbonization Path"
- Water Footprint
- Ecological Footprint

METODOLOGÍA DOCENTE

Aspectos metodológicos generales de la asignatura

METHODOLOGY IN THE CLASSROOM:

- Expository lesson: The teacher will explain the fundamental concepts. Students will be able to participate by asking questions or contributing the knowledge they have in this regard.
- Practical lesson: The teacher will formulate a problem and the students will solve it using learned methodologies and specific software.
- Practical project: In order to evaluate the practicality of the subject and the acquisition of knowledge by the students.

METHODOLOGY OUTSIDE THE CLASSROOM:

- Pre-reading the study material on the topic that will be discussed in class. Study and assimilation of the basic concepts.
- Carrying out practical projects, using office tools, graphic design, modelling and LCA study, making the appropriate calculations, analysing and justifying the results.

RESUMEN HORAS DE TRABAJO DEL ALUMNO

FACE-TO-FACE HOURS



- Master class, presentations and seminars: 20 hours.
- Practical classes: 10 hours.

NON-FACE-TO-FACE HOURS

- Autonomous work on the contents: 25 hours.
- Work on the practical project: 35 hours

TOTAL HOURS: 90 hours (3,0 ECTS)

EVALUACIÓN Y CRITERIOS DE CALIFICACIÓN

Calificaciones

ORDINARY EVALUATION

The grade of the subject in ordinary evaluation shall be ≥ 5 to pass the subject and is calculated as the weighted sum of:

- Final (Semi-Annual) exam grade (40%). The minimum grade on the exam must be 4.00 in order to make the weighted average.
- Grade of practical project (60%) The minimum grade for this project must be 5.00 in order to make the weighted average. The Grade of practical project is calculated according to specific normative available in Moodle.

If one of the minimum grade requirements (in the final exam or at the practical project) is not met, the final grade of the student will be the lowest grade obtained, either in the final exam or in the practical project.

EXTRAORDINARY EVALUATION

In an extraordinary evaluation case, the student will perform again that part that was not pass or in which did not reach the minimum required grade or the exam in the case that the weighted average of the exam and the practical project is below 5.00.

The rating will result from the weighted sum of:

- Extraordinary exam grade (40%) The minimum grade on that test must be 5.00 in order to make the weighted average.
- Grade of practical project (60%) The minimum grade for this project must be 5.00 in order to make the weighted average.

If one of the minimum grade requirements (in the final exam or at the practical project) is not met, the final grade of the student will be the lowest grade obtained, either in the final exam or in the practical project.

BIBLIOGRAFÍA Y RECURSOS

Bibliografía Básica

- Henrikke Baumann and Anne-Marie Tillman. The Hitch Hiker's Guide to LCA: An Orientation in Life Cycle Assessment Methodology and Applications. Ed. Studentlitteratur AB . (2004).
- Michael Z. Hauschild, Ralph K. Rosenbaum and Stig Irving Olsen. LCA Theory and Practice. Springer. (2018).
- ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework.
- Introduction to LCA with SimaPro. Pre Consultants.
- Towards a Life Cycle Sustainability Assessment: Making Informed Choices on products. United Nations Environment Programme



COMILLAS

UNIVERSIDAD PONTIFICIA

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CIHS

GUÍA DOCENTE
2024 - 2025

(2011).

Bibliografía Complementaria

- Mary Ann Curran. Life Cycle Assessment Handbook. Willey (2012).
- Olivier Jolliet, Myriam Saade-Sbeih, Shanna Shaked, Alexandre Jolliet and Pierre Crettaz. Environmental Life Cycle Assessment . CRC Press (2015).
- Tutorial Simapro. Pre Consultants.
- International Reference Life Cycle Data System (ILCD) (<https://eplca.jrc.ec.europa.eu/ilcd.html>).
- ISO 14006:2020 Environmental management systems — Guidelines for incorporating eco-design.
- ISO 14020 to ISO 14024 on Environmental Labelling.
- ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines.
- ISO 14046:2014 Environmental management — Water footprint — Principles, requirements and guidelines.
- ISO 14064-Greenhouse gases – Part 1,2 and 3.
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification.
- ISO/TR 14069:2013 Greenhouse gases — Quantification and reporting of greenhouse gas emissions for organizations.