Degree competences to which the subject contributes

Specific:
1. The ability to apply the methods and tools used in the management of the industrial manufacturing sector, information and communication technologies and measuring, modelling and simulation systems in the identification, information management, planning, management, execution and assessment of programmes and projects in the fields of industrial engineering and engineering project management.

Transversal:
2. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.
480152 - DUPS - Sustainable Design of Products and Services

**Teaching methodology**

The following teaching methods will be used in the development of the course:

- **Lecture or conference (EXP):** Sharing knowledge through lectures by professors or by external guest speakers.

- **Problem solving and case studies (RP):** Group decision exercises, debates, and group dynamics, with the teacher and students in the classroom; class presentation of an activity carried out individually or in small groups.

- **Theoretical/practical supervised work (TD):** Classroom activity or exercise of theoretical or practical contents, carried out individually or in small groups, with the advice and supervision of the teacher.

- **Extensive project (PA):** Learning based in the design, planning, and realisation in groups of a complex or extensive project or piece of work, applying and extending knowledge and writing a report on this approach and the results and conclusions.

**Evaluation Activities (EV)**

- **Training activities:**
  - The following training activities will be used in the development of the course:
    - **Face-to-face:**
      - **Theoretical classes and conferences (CTC):** Knowledge, understanding, and synthesis of contents presented by the lecturer (professor) or by guest speakers.
      - **Practical classes (CP):** Participation in group exercises, as well as discussions and group dynamics, with the teacher and other students in the classroom.
      - **Presentations (PS):** Class presentations of an activity carried out individually or in small groups.
      - **Theoretical/practical work tutorials (TD):** Carry out in the class an activity or exercise, theoretical or practical in nature, individually or in small groups, with the advice of the professor.
    - **Remote:**
      - Carry out an extensive project or piece of work (PA): design, plan, and conduct individually or in groups, a complex or extensive project or piece of work, applying and extending knowledge and writing a report on this approach and the results and conclusions.
      - **Autonomous study (EA):** Study or development of the subject individually or in groups, understanding, assimilating, analysing, and synthesising knowledge.

**Learning objectives of the subject**

Get acquainted with sustainable value design and different existing approaches and strategies that focus on the environmental and social aspects of sustainable design.

At the end of this module, the student will:
- Getting insights in the presented approaches and how to apply them on an own design project.
480152 - DSPS - Sustainable Design of Products and Services

- To learn how to apply Design for Sustainability strategies, experience and evaluate their effectiveness.
- Think critically from the analysis, synthesis and evaluation of various alternatives.
- Be sensitive to social and environmental issues from concerns about the environmental impact of the solutions and understanding of the social problems.
- Understand language, understanding English as the language of work and media.
- Self-learning and long life learning.
- Understand the impact that the use of technology has on society that adopts it and the basic principles for a sustainable technology.
- Analyse the material and energy flows that occur in a system (industrial, architectural, urban) and their relationship with the land and resources that sustain it.
- Design, plan, implement and evaluate technology, scientific or management projects in the framework of sustainability.
- Understand the interrelationship of systems as material and energy flows to the environment.

### Study load

<table>
<thead>
<tr>
<th><strong>Total learning time</strong>: 125h</th>
<th>Hours large group: 30h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Hours small group: 0h</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Guided activities: 15h</td>
<td>12.00%</td>
<td></td>
</tr>
<tr>
<td>Self study: 80h</td>
<td>64.00%</td>
<td></td>
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</tbody>
</table>
# Content

## Unit 1: Introduction to Design for Sustainability.

**Degree competences to which the content contributes:**

**Description:**
Introduction to sustainable design.

## Unit 2: Eco-design.

**Learning time:** 4h  
Theory classes: 4h

**Description:**
Introduction to Eco-design Strategy.

**Related activities:**
A1

## Unit 3: Cradle to Cradle.

**Learning time:** 4h  
Theory classes: 4h

**Description:**
Introduction to Cradle to Cradle Strategy.

**Related activities:**
A2

## Unit 4: Biomimicry.

**Learning time:** 4h  
Theory classes: 4h

**Description:**
Introduction to Biomimicry Strategy.

**Related activities:**
A3
<table>
<thead>
<tr>
<th>Unit</th>
<th>Description</th>
<th>Learning time: 4h</th>
<th>Related activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. <strong>Product Service Systems.</strong></td>
<td>Introduction to Product Service Systems Strategy.</td>
<td>Theory classes: 4h</td>
<td>A4</td>
</tr>
<tr>
<td>6. <strong>Social design.</strong></td>
<td>Introduction to Social design Strategy.</td>
<td>Theory classes: 4h</td>
<td>A5</td>
</tr>
<tr>
<td>7. <strong>Design for Sustainable Behaviour.</strong></td>
<td>Introduction to design for sustainable behaviour Strategy.</td>
<td>Theory classes: 4h</td>
<td>A6</td>
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<tr>
<td>8. <strong>CESEducpack Sustainability.</strong></td>
<td>Introduction to CESEducpack Sustainability design software.</td>
<td>Theory classes: 4h</td>
<td>A7</td>
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</table>
### Planning of activities

<table>
<thead>
<tr>
<th>A1. ECO-DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td>Reflection on Eco-design methodology and tools as a Sustainable design strategy + learning portfolio.</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
</tr>
<tr>
<td>Lecture readings and scientific papers.</td>
</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
</tr>
<tr>
<td>Report.</td>
</tr>
<tr>
<td><strong>Specific objectives:</strong></td>
</tr>
<tr>
<td>To know the principles and tools of eco-design. Methodology and case studies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A2. CRADLE TO CRADLE</th>
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</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
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<tr>
<td>Reflection on C2C methodology and tools as a Sustainable design strategy + learning portfolio.</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
</tr>
<tr>
<td>Lecture readings and scientific papers.</td>
</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
</tr>
<tr>
<td>Report.</td>
</tr>
<tr>
<td><strong>Specific objectives:</strong></td>
</tr>
<tr>
<td>To know the principles and tools of C2C. Methodology and case studies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A3. BIOMIMICRY</th>
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</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
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<tr>
<td>Reflection on Biomimicry methodology and tools as a Sustainable design strategy + learning portfolio.</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
</tr>
<tr>
<td>Lecture readings and scientific papers.</td>
</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
</tr>
<tr>
<td>Report.</td>
</tr>
<tr>
<td><strong>Specific objectives:</strong></td>
</tr>
<tr>
<td>To know the principles and tools of Biomimicry. Methodology and case studies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A4. PRODUCT SERVICE SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td>Reflection on PSS methodology and tools as a Sustainable design strategy + learning portfolio.</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
</tr>
<tr>
<td>Lecture readings and scientific papers.</td>
</tr>
<tr>
<td><strong>Descriptions of the assignments due and their relation to the assessment:</strong></td>
</tr>
<tr>
<td>Report.</td>
</tr>
</tbody>
</table>
## A5. SOCIAL DESIGN

**Description:**
Reflection on social design methodology and tools as a Social design strategy + learning portfolio.

**Support materials:**
Lecture readings and scientific papers.

**Descriptions of the assignments due and their relation to the assessment:**
Report.

**Specific objectives:**
To know the principles and tools of social design. Methodology and case studies.

## A6. DESIGN FOR SUSTAINABLE BEHAVIOUR

**Description:**
Reflection on design for sustainable behaviour methodology and tools as sustainable design strategy + learning portfolio.

**Support materials:**
Lecture readings and scientific papers.

**Descriptions of the assignments due and their relation to the assessment:**
Report.

**Specific objectives:**
To know the principles and tools of design for sustainable behaviour. Methodology and case studies.

## A7. CESEDUPACK

**Description:**
Reflection on social design methodology and tools as a Social design strategy + learning portfolio.

**Support materials:**
Lecture readings and scientific papers.

**Descriptions of the assignments due and their relation to the assessment:**
Report.

**Specific objectives:**
To know the principles and tools of design for sustainable behaviour. Methodology and case studies.

## A8. PROJECT

| Hours | Self study: 45h |
**Description:**
Group work (3/4 students). Implementation of CESEdupack Sustainability approach to a Sustainability problem through sustainability design strategies

**Support materials:**
Lecture readings and scientific papers, stakeholders interviews, CESEdupack sustainability software.

**Descriptions of the assignments due and their relation to the assessment:**
Report.

**Specific objectives:**
Design, plan, implement and evaluate technology, scientific or management projects in the framework of sustainability design

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**Qualification system**

- EV1: Written test (PE). 0%
- EV2: Oral test (PO). 10%
- EV3: Individual or group coursework (TR). This includes results and reports and their oral presentation. 30%
- EV4: Class and laboratory attendance and participation (AP). 0%
- EV5: Performance and quality of group work (TG). 60%

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**Regulations for carrying out activities**

All activities will be uploaded to the ATENEA platform. The project will be defended and discussed with all students.
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Bibliography

Basic:


