

## 320175 - ECODIS - Ecodesign

Coordinating unit:	205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering		
Teaching unit:	205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering		
Academic year:	2019		
Degree:	BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional)		
ECTS credits:	6	Teaching languages:	English

### Teaching staff

Coordinator: Gemma Molins Duran

### Prior skills

To achieve the objectives of this course students may have passed the course TECHNOLOGY AND ENVIRONMENTAL SUSTAINABILITY.

Students must also have obtained some generic skills such as ability to synthesize and reasoning, teamwork and respect for people

### Degree competences to which the subject contributes

Transversal:

1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
2. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.
3. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
4. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

### Teaching methodology

This course is based on learning through projects. There will be theoretical sessions with the presentation of concepts, techniques and procedures combined with workshops.

In theoretical sessions it will be introduced the basis of the subject with practical examples to facilitate understanding. The workshops will consist of practical problems to guide towards the realization of the project of the course. Students, independently, will assimilate concepts and propose solutions to the problems.

The appropriate methodology will be used to ensure that learning is the result of the efforts of the students in the development of the project.

If possible, within the course activities visits to organizations will be scheduled. These visits are scheduled throughout the year depending on the availability in each case.

### Learning objectives of the subject

The objectives of the course are to enable students to:

- Identify and assess the main impacts of a product or service
- Apply ecodesign strategies in a product or service

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- Use practical tools for ecodesign
- Apply the knowledge acquired during the course and the degree in the project development

### Study load

Total learning time: 150h	Hours large group:	30h	20.00%
	Hours small group:	30h	20.00%
	Self study:	90h	60.00%

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### Content

<p>Topic 1: Ecodesign, an introduction</p>	<p>Learning time: 4h Theory classes: 4h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Sustainable development</li> <li>- Ecodesign</li> <li>- Life cycle thinking</li> <li>- Tools</li> <li>- Regulations</li> </ul>	
<p>Topic 2: Ecodesign strategies</p>	<p>Learning time: 43h Theory classes: 16h Guided activities: 2h Self study : 25h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Ecodesign strategies</li> <li>- Ecodesign tools and methods <ul style="list-style-type: none"> <li>o Life cycle assessment (LCA)</li> <li>o Other analysis methods and tools</li> <li>o Integrated software as an improvement tools</li> </ul> </li> </ul>	
<p>Topic 3: Ecodessign examples</p>	<p>Learning time: 13h Theory classes: 8h Self study : 5h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Ecodesigned products</li> <li>- Ecodesign communication (EPD and Ecolabels)</li> </ul>	
<p>Topic 4: Ecodesign project</p>	<p>Learning time: 90h Laboratory classes: 30h Self study : 60h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Ecodesign project</li> </ul>	

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### Planning of activities

<p><b>LIFE CYCLE THINKING WORKSHOP</b></p>	<p>Hours: 2h Theory classes: 2h</p>
<p><b>Description:</b> After a basic introduction, students will be guided through a series of exercises to have them go through the life cycle thinking process themselves</p> <p><b>Support materials:</b> Posted in ATENEA</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> To upload a document to ATENEA with the results and conclusions from the workshop 10% of the final grade</p> <p><b>Specific objectives:</b> Give students basic familiarity with core concepts Introduce LCA as a way of screening and comparing alternative solutions</p>	
<p><b>PROJECT ELECTION</b></p>	<p>Hours: 2h Self study: 2h</p>
<p><b>Description:</b> Group election and selection of the item that the ecodesign project will focus on</p> <p><b>Support materials:</b> Posted in ATENEA</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> Upload the document to ATENEA 2% of the final grade</p> <p><b>Specific objectives:</b> Give students basic familiarity with core concepts Introduce LCA as a way of screening and comparing alternative solutions</p>	
<p><b>PRODUCT MANUFACTURING PROCESS DESCRIPTION</b></p>	<p>Hours: 10h Laboratory classes: 2h Self study: 8h</p>
<p><b>Description:</b> Description of the manufacturing process of the item that is going to be ecodesigned</p> <p><b>Support materials:</b> Posted in ATENEA</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> Upload the document to ATENEA 8% of the final grade</p> <p><b>Specific objectives:</b> Study the manufacturing process in order to find point to improve</p>	

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ENVIRONMENTAL IMPACT ASSESSEMENT	Hours: 16h Laboratory classes: 4h Self study: 12h
<p>Description: Assess the environmental impact of a product</p> <p>Support materials: Posted in ATENEA</p> <p>Descriptions of the assignments due and their relation to the assessment: Upload the document to ATENEA 15% of the final grade</p> <p>Specific objectives: To make an environmental assessment</p>	
PROPOSALS TO IMPROVE THE ENVIRONMENTAL PERFORMANCE	Hours: 25h Laboratory classes: 10h Self study: 15h
<p>Description: Make proposals in the design of the product in order to improve its environmental performance</p> <p>Support materials: Posted in ATENEA</p> <p>Descriptions of the assignments due and their relation to the assessment: Upload the document to ATENEA 15% of the final grade</p> <p>Specific objectives: To analyze the environmental impact of the product and suggest improvements</p>	
ENVIRONMENTAL COMMUNICATION	Hours: 23h Laboratory classes: 8h Self study: 15h
<p>Description: Define the best way to communicate the environmental improves of the product</p> <p>Support materials: Posted in ATENEA</p> <p>Descriptions of the assignments due and their relation to the assessment: Upload the document to ATENEA 15% of the final grade</p> <p>Specific objectives: Analyze the ecodesign communication tools in order to choose the best in each case</p>	

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PROJECT PRESENTATION	Hours: 14h Laboratory classes: 6h Self study: 8h
<p>Description: Present to the rest of the class the ecodesigned product and how the product has been improved</p> <p>Support materials: Posted in ATENEA</p> <p>Descriptions of the assignments due and their relation to the assessment: Upload a document to ATENEA with the oral presentation 20% of the final grade</p> <p>Specific objectives: Make an oral presentation Present the team's project to the entire class</p>	

### Qualification system

- Test: 15%
- Workshops: 10%
- Project deliverable 1 and 2: 10%
- Project deliverable 3 to 5: 45%
- Project presentation: 20%

### Regulations for carrying out activities

Students must do all the activities in order to obtain a continuous assessment

### Bibliography

Others resources:

- (1) Guinée JB. Handbook on life cycle assessment. Dordrecht etc.: Kluwer Academic Publishers; 2002.
- (2) Hendrickson CT. Environmental life cycle assessment of goods and services :an input-output approach. Washington, D.C.: Resources for the Future; 2006.
- (3) Finnveden G, Hauschild M, Ekvall T, Guinée J, Heijungs R, Hellweg S, et al. Recent developments in Life Cycle Assessment. J Environ Manage 2009;91(1):1-21.
- (4) Heijungs R, Huppes G, Guinée J. Life cycle assessment and sustainability analysis of products, materials and technologies. Toward a scientific framework for sustainability life cycle analysis. Polymer degradation and stability 2010;95(3):422-428.
- (5) International Standard Organisation. ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework. 2006.
- (6) International Standard Organisation. ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines. 2006.
- (7) Joint Research Center, Institute for environment and sustainability. International reference Life Cycle Data System (ILCD) Handbook - General guide for Life Cycle Assessment - Detailed guidance. 1st ed. Luxembourg: Publications Office of the European Commission; 2010.