

Course guide

340004 - SOAP-O7P40 - Sustainability Applied

Last modified: 03/04/2024

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 729 - MF - Department of Fluid Mechanics.

Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Optional subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

Coordinating lecturer: Jordi Segalàs Coral

Others: Jaume Miret i Tomàs
Jordi Segalàs i Coral

PRIOR SKILLS

no

REQUIREMENTS

no

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. CE16. Basic knowledge and application of environmental technologies and sustainability.

Transversal:

02 SCS N2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

02 SCS N3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.

05 TEQ N1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.

02 SCS. 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.

TEACHING METHODOLOGY

The course is based on projects that students will develop along the course. However there will be theoretical sessions exposed by the teacher.

Large Group: During the 50% of the hours in large group the teacher will present the theoretical issues as a basis for addressing the projects.

Large group and small group: The rest of the time in large group and all small group sessions will be devoted to develop the project in groups of two people. At the end of the course the students will present the work to the class. Furthermore, a final dossier will be provided.

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 .

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.

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 technologies.

At the end of this module, the student will:

- Getting insights in the presented approaches and how to apply them on an own technological project.
- 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

Type	Hours	Percentage
Self study	105,0	63.64
Hours small group	30,0	18.18
Hours large group	30,0	18.18

Total learning time: 165 h

CONTENTS

Tema 2. Ecodesign.

Description:

To know the principles and tools of eco-design. Methodology and case studies.

Full-or-part-time: 24h 40m

Theory classes: 7h 20m

Laboratory classes: 2h 20m

Self study : 15h

Tema 3. CRADLE TO CRADLE

Description:

To know the principles and tools of C2C. Methodology and case studies.

Full-or-part-time: 24h 40m

Theory classes: 7h 20m

Laboratory classes: 2h 20m

Self study : 15h



Tema 1. Introduction to Design for Sustainability.

Description:

Introduction to sustainable design.

Full-or-part-time: 24h 40m

Theory classes: 7h 20m

Laboratory classes: 2h 20m

Self study : 15h

Tema 4. Biomimicry.

Description:

Introduction to Biomimicry Strategy.

Full-or-part-time: 24h 40m

Theory classes: 7h 20m

Laboratory classes: 2h 20m

Self study : 15h

Tema 5. Product Service Systems.

Description:

Introduction to Product Service Systems Strategy.

Full-or-part-time: 24h 40m

Theory classes: 7h 20m

Laboratory classes: 2h 20m

Self study : 15h

Tema 6. The design tool CESEducpack.

Description:

Introduction to CESEducpack Sustainability design software.

Full-or-part-time: 24h 40m

Theory classes: 7h 20m

Laboratory classes: 2h 20m

Self study : 15h

GRADING SYSTEM

The final grade will be the grade for the group project.

The project may be re-evaluated.

BIBLIOGRAPHY

Basic:

- Desarrollo sostenible para ingenieros [on line]. Barcelona: UPC, 2007 [Consultation: 07/03/2022]. Available on: <https://upcommons.upc.edu/handle/2099.3/36831>. ISBN 9788483018927.
- Xercavins, J. ; Cayuela, D. ; Cervantes, N. ; Sabater A.. Desarrollo sostenible [on line]. Barcelona: Edicions UPC, 2005 [Consultation: 07/03/2022]. Available on: <https://upcommons.upc.edu/handle/2099.3/36752>. ISBN 8483018055.
- Ashby, M. F. Materials and sustainable development [on line]. Waltham, MS: Elsevier, 2015 [Consultation: 20/02/2024]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9780081001769/materials-and-sustainable-development>. ISBN 9780081001769.
- Dresner, Simon. Els Principis de la sostenibilitat [on line]. Barcelona: Edicions UPC, 2009 [Consultation: 10/03/2022]. Available on: <https://upcommons.upc.edu/handle/2099.3/36834>. ISBN 9788498803600.