

## Course guide

### 220043 - GBE - Greening the Built Environment

**Last modified:** 19/04/2023

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 758 - EPC - Department of Project and Construction Engineering.

**Degree:** BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 3.0    **Languages:** English

#### LECTURER

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**Coordinating lecturer:** MARTA GANGOLELLS SOLANELLAS

**Others:**

#### TEACHING METHODOLOGY

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The course is divided into parts:

- Theory classes
- Practical classes
- Self-study for doing exercises and activities.

In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.

In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.

Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.

The teachers provide the syllabus and monitoring of activities (by ATENEA).

#### LEARNING OBJECTIVES OF THE SUBJECT

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The aim of this subject is to provide basic knowledge on Life Cycle Assessment, a powerful tool to analyse the environmental impact of a product or a process during the whole life-cycle analysis. The course will be mainly concerned with the underlying theoretical concepts and real case studies, showing a wide range of applications. This subject will also introduce other metrics such as Carbon Footprint. At the end of the course, students will be able to better support decision-making processes within the context of product improvement or comparison.

#### STUDY LOAD

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Type	Hours	Percentage
Self study	45,0	60.00
Hours large group	30,0	40.00

**Total learning time:** 75 h

## CONTENTS

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### Life Cycle Assessment (LCA)

**Description:**

(ENG) Introduction to life cycle assessment

LCA methodology:

- Goal definition and scoping
- Inventory analysis
- Impact assessment
- Interpretation

Analysis of LCA case studies and applications

LCA project development

**Related activities:**

(CAT) Analysis of LCA case studies and applications.

LCA project developed in small groups, including compilation of an inventory of relevant inputs and outputs, evaluation of potential impacts associated with identified inputs and outputs, interpretation of the results and report writing.

During some sessions, small exercises will be conducted in the class individually or in small groups and some others will be virtual.

**Full-or-part-time:** 75h

Theory classes: 30h

Self study : 45h

## GRADING SYSTEM

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The final grade depends on the following assessment criteria:

- Class activities, weight: 35 %
- LCA case studies, weight: 35 %
- LCA project, weight: 30 %

Non-satisfactory results in the project will be able to be redirected by improving the project individually after highlighting weak points. All the students have the right to improve the project. The improved project will have to be delivered the day scheduled by the school within the period of final exams. Marks in the improved project can range from 0 to 10. Only the best mark will be taken into account.

## BIBLIOGRAPHY

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**Basic:**

- Curran, Mary Ann. Life cycle assessment student handbook [on line]. Hoboken, NJ: Salem, Mass: John Wiley & Sons Inc.; Scrivener Publishing LLC, [2015] [Consultation: 14/11/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=4911663>. ISBN 9781119083559.

- Schenck, Rita; White, Phillip. Environmental life cycle assessment: measuring the environmental performance of products. Vashon Island, Washington: American Center for Life Cycle Assessment, [2014]. ISBN 9780988214552.