Course guide
240433 - 240PE036 - Service-Learning Project in the Stem Field I

Last modified: 27/01/2026

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 709 - DEE - Department of Electrical Engineering.
749 - MAT - Department of Mathematics.
712 - EM - Department of Mechanical Engineering.
732 - OE - Department of Management.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Marta Aguilar Pérez

Others: Elisabet Mas de les Valls
Cristina Lampón
Oriol Boix
Joaquim Minguella

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
01 EIN. ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
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.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
07 AAT. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
CT8. Gender perspective. To know and to understand, from the scope of the degree itself, the inequalities due to sex and gender in society; to integrate the different needs and preferences based on sex and gender in the design of solutions and problem solving.

TEACHING METHODOLOGY

The main objective of this course is to encourage and promote new vocations in engineering among primary and/or secondary school students, with a special focus on breaking down gender stereotypes in engineering and making engineering more accessible to students from socioeconomically disadvantaged backgrounds. This objective will be achieved by implementing ad hoc activities in primary and/or secondary schools. This will involve prior teamwork, including designing the activity, planning its implementation, carrying it out, monitoring it, and evaluating the entire process and its outcome. The designed activities should be creative, innovative, and demonstrate the social impact of engineering in an engaging way

LEARNING OBJECTIVES OF THE SUBJECT

The main objective of this course is to encourage and promote new vocations in engineering among primary and/or secondary school students, with a special focus on breaking down gender stereotypes in engineering and making engineering more accessible to students from socioeconomically disadvantaged backgrounds

STUDY LOAD

Type	Hours	Percentage
Guided activities	60,0	100.00

Total learning time: 60 h

CONTENTS

1. Management of the school prpoject

Description:
Satisfy all needs and requirements like purchasing material, creating communication platforms and contacts with the schools, among other actions that may be needed.

Specific objectives:
-Knowing how to work as part of a team to co-design activities for children
- Learning to manage a school project like this one
- Learning to respect team agreements and commitments

Full-or-part-time: 19h
Theory classes: 9h
Guided activities: 10h

2. Content development

Description:
Designing of activities of the monitoring process

Specific objectives:
Designing creative activities with a strong social component that also integrate basic engineering knowledge
- Understanding and implementing gender perspective principles in engineering activities
- Knowing how to act as a role model for the profession, respecting the values of the UPC and those agreed upon within the work team

Full-or-part-time: 76h
Theory classes: 30h
Guided activities: 46h

3. Implementation and analysis

Description:
Carrying out the activity in the schools, monitoring and analysing it. Communication.

Specific objectives:
- Learning to communicate clearly and engagingly with children
- Understanding and implementing gender perspective principles in engineering activities
- Knowing how to act as a role model for the profession, respecting the values of the UPC and those agreed upon within the work team

Full-or-part-time: 55h
Theory classes: 15h
Guided activities: 40h

GRADING SYSTEM

The evaluation method aims to involve the student. The indicators are:
â□□ Attendance at coordination meetings: 10%
â□□ Completion of (self-)assigned tasks: 45%
â□□ Quality of interventions based on evidence: 25%
â□□ Intermediate peer evaluation (middle stages of the project): 5%
â□□ Quality of the final analysis: 15%

BIBLIOGRAPHY

Basic:
- Bauer, Martin W.. Why Europe's girls aren't studying STEM [on line]. London, UK: London School, 2017 [Consultation: 29/11/2024]. Available on: https://news.microsoft.com/wp-content/uploads/2017/02/Microsoft_girls_in_STEM_final-Whitepaper.pdf.
- Olmedo-Torre, N.; Peña, M.; López, M. ; Sanz, M. ; López, D.. "Mentoring female high students for a STEM career". Frontiers in Education (FIE) Conference 2018 [on line]. IEEE, 2019. [Consultation: 21/03/2024]. Available on: doi: 10.1109/FIE.2018.8658683.

RESOURCES

Other resources:
The students will have the ETSEIB Digital Manufacturing Space as a workplace or workshop.
Support material will be delivered throughout the course.