

## Course guide 240438 - 240PE041 - Service-Learning Project in the Stem Field M3

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Teaching unit:	732 - OE - Department of Management.
	709 - DEE - Department of Electrical Engineering.
	749 - MAT - Department of Mathematics.
	712 - EM - Department of Mechanical Engineering.
Degree:	MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).
Academic year: 2023	ECTS Credits: 6.0 Languages: Catalan
LECTURER	
Coordinating lecturer:	Minguella Canela, Joaquim
Others:	Peña Carrera, Marta
	Boix Aragonès, Oriol
	Doria Cerezo, Arnau

## **DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES**

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#### Transversal:

Unit in charges

CT1. (ENG) EMPRENEDORIA I INNOVACIÓ: Conèixer i comprendre l'organització d'una empresa i les ciències que regeixen la seva activitat; tenir capacitat per comprendre les normes laborals i les relacions entre la planificació, les estatègies industrials i comercials, la qualitat i el benefici.

CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.

CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

## **TEACHING METHODOLOGY**

The subject is conceived as a combination of sessions - on characteristic topics - deployed by the teaching staff with an expository nature (descriptions, characterizations, representations, explanations, arguments...), independent learning activities and participatory student activities (individual actions, joint activities...).

Conventional and non-conventional teaching methodologies are used (discussions, teamwork, sharing of criteria...). The student has a very effective role and active methodologies are used - starting from the basis that there are very different learning styles. The work method promotes student contributions. The subject is articulated based on the contribution of the student group, a delicate component to establish if you take into account that we are dealing with students of diverse origins who are only a little used to talking in public.

It is an educational proposal that combines learning processes and service to society with an innovative methodology. The university students will act as mentors for the students of the educational centers (primary, secondary, high school), illustrating the applications of science, technology, engineering and mathematics. University students will put into practice the knowledge, skills and abilities specific to their degree.



## LEARNING OBJECTIVES OF THE SUBJECT

- SUSTAINABILITY AND SOCIAL COMMITMENT: Know and understand the complexity of the economic and social phenomena typical of the welfare society; ability to relate well-being to globalization and sustainability; ability to use technique, technology, economy and sustainability in a balanced and compatible way.

- TEAMWORK: Being able to work as a member of a team, either as another member, or performing management tasks in order to contribute to developing projects with pragmatism and a sense of responsibility, while assuming commitments considering the available resources.

- GENDER PERSPECTIVE: Know and understand, from the scope of the degree itself, the inequalities due to sex and gender in society, and integrate the various needs and preferences due to sex and gender in the design of solutions and problem solving.

## CONTENTS

#### 1. Competence training

#### Description:

A training will be offered for the university students who will participate in the project on the skills needed to carry out the project

# **Full-or-part-time:** 30h Theory classes: 12h

Guided activities: 9h Self study : 9h

#### 2. Definition and planning of the sessions

#### **Description:**

The content of the project will be defined, in particular the content of the sessions, its development will be planned and the work team will be organized.

## Full-or-part-time: 45h

Theory classes: 18h Guided activities: 13h 30m Self study : 13h 30m

## 3. Selection and contact with the educational centers

#### **Description:**

Different educational centers from diverse socio-economic backgrounds will be contacted to select those that will participate in the project.

**Full-or-part-time:** 15h Theory classes: 6h Guided activities: 4h 30m Self study : 4h 30m



#### 4. Implementation of the project in the selected schools

#### **Description:**

The activities scheduled in the educational centers will be carried out. Data will be collected before and after the intervention to evaluate its impact.

**Full-or-part-time:** 15h Theory classes: 6h Guided activities: 4h 30m Self study : 4h 30m

### 5. Project evaluation

#### **Description:**

An evaluation of the project will be carried out to identify strengths and weaknesses and propose possible improvements for future editions.

## Full-or-part-time: 45h Theory classes: 18h Guided activities: 13h 30m Self study : 13h 30m

## **GRADING SYSTEM**

The academic methodology seeks the involvement of the student. Fundamentally, a formative assessment is carried out, which allows a feedback system to be based on it and which serves the teaching staff to perceive assimilations of what is being done. In participatory activities, students are organized into teams. Each team must consider actions that arise throughout the sessions. The final grade is calculated as follows:

- Session design (contents): 25%

- Planning and organization of sessions (preparation, logistics): 25%
- Development of the sessions (includes active participation): 50%

## **BIBLIOGRAPHY**

#### **Basic:**

Let's Go Engineering, Congrés Dones, Ciència i Tecnologia, WSCITECH 2019 [on line]. Available on: <a href="https://idus.us.es/bitstream/handle/11441/97917/Comunicacin-Terrassa-2019-p%C3%A1ginas-2-18.pdf?sequence=1&isAllowed=y.-Why Don't Girls Choose Technological Studies? Adolescents' Stereotypes and Attitudes towards Studies Related to Medicine or Engineering. Psicooncologia, 12(1) [on line]. Available on: 10.5209/rev\_sjop.2011.v14.n1.6..</li>
Nou llibreMentoring female high students for a STEM career.

#### 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.