

# Course guide

## 295770 - 295EM023 - Technological Innovation

Last modified: 14/06/2023

**Unit in charge:** Barcelona East School of Engineering  
**Teaching unit:** 732 - OE - Department of Management.

**Degree:** MASTER'S DEGREE IN MATERIALS SCIENCE AND ADVANCED MATERIALS ENGINEERING (Syllabus 2019).  
(Compulsory subject).

**Academic year:** 2023    **ECTS Credits:** 6.0    **Languages:** English

### LECTURER

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**Coordinating lecturer:** Jordi Olivella Nadal

**Others:** GEMA CALLEJA SANZ  
JORGE OLIVELLA NADAL

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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#### Specific:

CEMUEQ-09. Manage Research, Development and Technological Innovation, taking into account the transfer of technology and property and patent rights

CEMUEII-05. Apply predictive analytics to identify risks and opportunities for innovation in different areas of the company, planning and managing a project to create a new technological product and its business model.

CEMUEQ-10. To adapt to the structural changes of society motivated by factors or phenomena of an economic, energetic or natural character and to contribute with technological solutions with a high commitment of sustainability

CEMUEII-07. Identify and evaluate internal and external technologies, both consolidated and emerging, and propose management actions in accordance with the company's strategy. Plan and manage RDI projects and recognize the procedures to obtain public-private financing for the mentioned projects.

#### Generical:

CGMUEQ-04. To carry out the appropriate research, undertake the design and manage the development of engineering solutions, in new or little known environments, relating creativity, originality, innovation and technology transfer

CGMUEQ-09. Communicate and discuss proposals and conclusions in multilingual, specialized and non-specialized forums, in a clear and unambiguous way

CGMUEQ-10. Adapt to changes, being able to apply new and advanced technologies and other relevant developments, with initiative and entrepreneurial spirit

CGMUEII-03. Analyze the economic, social and environmental impact of technical solutions to base strategic decisions on criteria of objectivity, transparency and professional ethics.

CGMUEII-04. Transfer technological solutions in the form of products, services, processes or facilities in an efficient and sustainable manner, with an attitude of leadership and entrepreneurial spirit.

#### Transversal:

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.

### TEACHING METHODOLOGY

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The teaching of the course is based on different methodologies (Master classes, seminars, workshops, projects) prioritizing active learning and "learning by doing" through exercises and team projects.

## LEARNING OBJECTIVES OF THE SUBJECT

This course aims to provide students with an experience-based introduction into the technology-based innovation. A real life simulation of the process that innovators go through when considering a technological business opportunity will be performed. To do so, the different steps of the innovation process will be considered. In particular, the phases considered will be: (1) analysis of a technology opportunity, (2) definition of a proposal, and (3) presentation of a proposal.

At the end of the course, the student will be able to use the tools analysis of analysis that are used in the innovation world to assess a technological business opportunity and to present the results appropriately.

## STUDY LOAD

| Type              | Hours | Percentage |
|-------------------|-------|------------|
| Hours small group | 20,0  | 13.33      |
| Self study        | 96,0  | 64.00      |
| Hours large group | 34,0  | 22.67      |

**Total learning time:** 150 h

## CONTENTS

### Innovation tools

**Description:**

CX/Design thinking  
Business Model Innovation  
Blue Ocean  
Tech trends

**Full-or-part-time:** 17h

Theory classes: 17h

### Analysis of a technological opportunity

**Description:**

Obtaining of information  
Level of development  
Comparison of alternatives  
Technology forecasting

**Full-or-part-time:** 17h

Theory classes: 17h

## GRADING SYSTEM

Class assignments of blocks 1 and 2: 30% each  
Course project: 40%



## BIBLIOGRAPHY

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### Basic:

- Lannon, John M. Technical communication [on line]. 14th ed. Boston: Pearson Education Limited, [2016] [Consultation: 14/09/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=5186037>. ISBN 9781292154305.
- Osterwalder, Alexander; Pigneur, Yves; Clark, Tim. Business model generation : a handbook for visionaries, game changers, and challengers [on line]. Hoboken, New Jersey: John Wiley & Sons, cop. 2010 [Consultation: 14/09/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=581476>. ISBN 9780470876411.
- Trott, Paul. Innovation management and new product development. Sixth Edition. Harlow: Pearson, [2017]. ISBN 9781292133423.
- Olivella Nadal, Jordi. Technology evaluation for entrepreneurs [on line]. Copenhagen: Bookboon.com, 2018 [Consultation: 14/09/2022]. Available on: <https://yourknow.com/uploads/books/technology-evaluation-for-entrepreneurs.pdf>. ISBN 9788740323603.
- Bombardó, C.; Aguilar, M. ; Barahona, C. Technical writing : a guide for effective communication [on line]. Barcelona: Edicions UPC, 2007 [Consultation: 08/02/2018]. Available on: <http://hdl.handle.net/2099.3/36667>. ISBN 9788483019276.