Course guides
250MUM002 - 250MUM002 - Project Based on an Innovation Challenge

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 732 - OE - Department of Management.
751 - DECA - Department of Civil and Environmental Engineering.
739 - TSC - Department of Signal Theory and Communications.
710 - EEL - Department of Electronic Engineering.

Degree: MASTER'S DEGREE IN URBAN MOBILITY (Syllabus 2020). (Optional subject).

Academic year: 2020  ECTS Credits: 10.0  Languages: English

LECTURER

Coordinating lecturer: Bragos Bardia, Ramon

Others: Estrada Romeu, Miguel Angel
Ribas Vila, Immaculada
Sayrol Clols, Elisa
Andujar Larios, Agustin

REQUIREMENTS

Having taken Innovation and Entrepreneurship for World Challenges

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE8. Identify the future consequences of short and long-term plans and decisions from an integrated scientific, ethical and intergenerational perspective and merge these elements into a solution-centered approach, moving towards a sustainable society. (Specific competence of the Innovation and Entrepreneurship specialty).
CE9. Translate innovations into viable business solutions. (Specific competence of the Innovation and Entrepreneurship specialty).
CE10. Strengthen the ability to think beyond the limits and systematically explore and generate new ideas. (Specific competence of the Innovation and Entrepreneurship specialty).
CE11. Apply knowledge, ideas and technology to create new, or significantly improve, products, services, processes, policies, business models or jobs. (Specific competence of the Innovation and Entrepreneurship specialty).
CE12. Use and apply cutting-edge research methods, processes and techniques for the creation and growth of new companies and also apply them in interdisciplinary teams and contexts. (Specific competence of the Innovation and Entrepreneurship specialty).
CE13. Transform practical experiences into research problems and challenges. (Specific competence of the Innovation and Entrepreneurship specialty).
CE14. Make decisions and strengthen leadership capacity, based on a holistic understanding of the contributions of higher education, research and business for value creation, in teams and contexts of limited size. (Specific competence of the Innovation and Entrepreneurship specialty).

General:
CG1. Properly apply mathematical, analytical, scientific, instrumental, technological, information and management knowledge in the field of urban mobility.
CG2. Conduct research, development and innovation in the field of mobility, as well as direct the development of mobility solutions in new or little-known environments, relating creativity, innovation and technology transfer.
CG6. Reason and act based on the so-called culture of security and sustainability.
CG7. Promote entrepreneurship projects, seeking new business opportunities and adding value to solutions aimed at the long-term well-being of citizens in urban environments.
TEACHING METHODOLOGY

The teaching and learning methodology is based on the challenge-based learning model. Usually an external company or institution provides an open challenge to the team. Using the Design Thinking methodology, student teams must perform an in-depth research task to discover the needs of the users associated with the challenge, choose the most relevant one using objective criteria based on user feedback, define several solutions and choose the most suitable one, again using quick representations and prototypes of the idea and obtaining feedback from users and other relevant stakeholders and finally, designing and partially implementing a proof-of-concept prototype. Depending on the type of solution and the previous experience and knowledge of the members of each team, the degree of implementation of the prototype may be more or less functional. With a limited time (i.e. one semester), there is a tradeoff between the ability to create a truly innovative and validated idea and the ability to develop a complex and functional prototype. In this case, the capacity for innovation is prioritized. Part of the phase of needs identification and solution ideation is carried out in the subject of the previous semester Innovation and Entrepreneurship for Global Challenges. In this course, it is also developed the planning of the implementation of the solution, the evaluation of its cost and a business model for its potential development in the market.

LEARNING OBJECTIVES OF THE SUBJECT

Apply basic systemic innovation methodologies such as Design Thinking methodology in a complex multi-stakeholder environment.

Perform a structured problem solving analysis, critically assess and evaluate a third party request of specification.

Perform a market/industry analysis including modelling future scenarios and sustainability perspective. Formulate a partnership strategy. Perform stakeholder and risk analysis. Identify the short- and long-term future consequences of plans and decisions from an integrated scientific, ethical and intergenerational perspective.

Apply a project management and planning methodology. Lead a project team to meet set targets, milestones and deliverables. Resolve team conflicts in a structured way. Prioritize between alternative project paths. Recognize, adjust to and handle change management processes.

Report, present and communicate acquired conclusions.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>19,5</td>
<td>7.80</td>
</tr>
<tr>
<td>Guided activities</td>
<td>12,0</td>
<td>4.80</td>
</tr>
<tr>
<td>Hours small group</td>
<td>19,5</td>
<td>7.80</td>
</tr>
<tr>
<td>Hours large group</td>
<td>39,0</td>
<td>15.60</td>
</tr>
<tr>
<td>Self study</td>
<td>160,0</td>
<td>64.00</td>
</tr>
</tbody>
</table>

Total learning time: 250 h

CONTENTS

Specific technical contents

Description:
Depending on the topic of the project, it may be necessary to impart specific contents, additional to those obtained in previous subjects.

Related activities:
Knowledge pills

Full-or-part-time: 15h
Theory classes: 15h
### Project Management d’innovació

**Description:**
Innovation projects management alternatives. Agile methodologies.

**Full-or-part-time:** 3h
Theory classes: 3h

### Business model design

**Description:**

**Full-or-part-time:** 15h
Theory classes: 15h

### Sustainability analysis

**Description:**
Sustainability analysis of a project from the economic, social and environmental point of view. Non-financial report.

**Full-or-part-time:** 3h
Theory classes: 3h

### Communication techniques

**Description:**
Techniques for the preparation and realization of oral presentations of innovation projects.

**Full-or-part-time:** 3h
Theory classes: 3h

### ACTIVITIES

#### Guided project development

**Description:**
Guided development of the project according to the techniques explained in the contents sessions.

**Full-or-part-time:** 172h
Guided activities: 12h
Self study: 160h

#### Team coordination meetings

**Full-or-part-time:** 19h 30m
Laboratory classes: 19h 30m
Presentations and discussion of intermediate and final results

**Full-or-part-time:** 19h 30m
Practical classes: 19h 30m

Contents presentation sessions

**Description:**
Interactive content presentation sessions on several topics: Project management, specific technical content, business model design, sustainability analysis, communication techniques

**Full-or-part-time:** 39h
Theory classes: 39h

GRADING SYSTEM

A global mark is assigned to the project developed by the team using a rubric that takes into account the different aspects of the process, the final result and the presentations and reports that have been made by the team. Basically, 50% is assigned to the process and 50% to the final result.

This mark is modulated for each component of the group with three coefficients, with a modulation rate of 30%. One is determined from the evidences collected by the teaching staff in the in-person sessions, the other is determined by the team leader (if it exists, depending on the team size) with the bag of points procedure and the other by the peer-assessment carried out by all members of the team using a rubric. In the latter case, the team leader is evaluated for his or her role as a team leader.

BIBLIOGRAPHY

**Basic:**