295107 - 295II015 - Technology Innovation

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2019
Degree: MASTER'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2019). (Teaching unit Compulsory)
MASTER'S DEGREE IN INTERDISCIPLINARY AND INNOVATIVE ENGINEERING (Syllabus 2019). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: English

Teaching staff
Coordinator: Joan Martínez Sánchez
Others: Joan Martínez Sánchez
Conferenciants convidats

Opening hours
Timetable: The hours of attention will be published in the course of the virtual campus of the EEBE UPC (ATENEA)

Prior skills
Basic statistics concepts.

Degree competences to which the subject contributes

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

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-02. To manage, plan and supervise multidisciplinary teams according to technological creativity, business opportunity, social impact and sustainable development.
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
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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.

03 TLG. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

Teaching methodology

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

At course completion, the student must:
Be able to apply mining techniques and data analysis to identify opportunities for innovation in different areas of the company.
Demonstrate the ability to plan and manage a project to create a new product or technological service and define its business model.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>34h</th>
<th>22.67%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>20h</td>
<td>13.33%</td>
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<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>96h</td>
<td>64.00%</td>
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## Content

<table>
<thead>
<tr>
<th>Technology innovation</th>
<th>Learning time: 6h 45m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h 15m</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h 30m</td>
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</tbody>
</table>

**Description:**
Introduction to technological innovation, relationship with the company’s competitive strategy and management tools.

**Specific objectives:**
Understand what technological innovation is, master the specific language. Know and apply various conceptual tools and schemes that will allow you to make decisions and design policies and innovation actions in a company.

<table>
<thead>
<tr>
<th>Data driven innovation</th>
<th>Learning time: 20h 15m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 12h 45m</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 7h 30m</td>
</tr>
</tbody>
</table>

**Description:**
Application of data mining and data analysis techniques to innovation in various areas of the company.

**Specific objectives:**
Be able to apply standard high-level data mining and data analysis software to various business situations that allow process, product or market innovation in a company.

<table>
<thead>
<tr>
<th>Business model of technological products</th>
<th>Learning time: 6h 45m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 4h 15m</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h 30m</td>
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</tbody>
</table>

**Description:**
Definition of a business model for a new technological product by applying the Osterwalder’s CANVAS model and the Lean CANVAS of Ash Maurya and its validation through the lean startup method.

**Specific objectives:**
Being able to move from a product concept to a strategy to obtaining or manufacturing this product and commercialize it in the market in an economically profitable way, validate this strategy interacting with the market and be able to communicate this strategy in a convincing way.
## New product development

<table>
<thead>
<tr>
<th>Learning time: 6h 45m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 4h 15m</td>
</tr>
<tr>
<td>Laboratory classes: 2h 30m</td>
</tr>
</tbody>
</table>

**Description:**
Study of the process of planning new products, their management, and control

**Specific objectives:**
Be able to plan a project to develop a new product or service, the required activities and resources, estimated the costs and potential risks, and manage and control its execution.

### Innovation Project

<table>
<thead>
<tr>
<th>Learning time: 13h 30m</th>
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<tbody>
<tr>
<td>Theory classes: 8h 30m</td>
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<tr>
<td>Laboratory classes: 5h</td>
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**Description:**
Product innovation project carried out in teams.

**Specific objectives:**
Be able to identify a real innovation opportunity and plan a project to launch a new product, and run the project until you get feedback from the market that allows validating the project or proceeding to its redefinition.

## Qualification system

2 partial exams with a weight of 25% each exam (50% the two exams)
1 exercise with a weight of 20%
1 Project for the development of a new product (30%).
There is no final exam.
There is a continuous evaluation and, therefore, there is no re-evaluation exams.

## Regulations for carrying out activities

The exercises must be delivered exclusively through the virtual campus course (ATENEA) and always on the indicated dates.
Bibliography

**Basic:**


**Complementary:**

