Course guide
295568 - 295EQ232 - Biopolymers and Bioplastics

Unit in charge: Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.
Degree: MASTER'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2019). (Optional subject).
ERASMUS MUNDUS MASTER'S DEGREE IN ADVANCED MATERIALS SCIENCE AND ENGINEERING (Syllabus 2021). (Optional subject).
Academic year: 2023 ECTS Credits: 6.0 Languages: Catalan, Spanish, English

LECTURER

Coordinating lecturer: Del Valle Mendoza, Luis Javier
Others: Primer quadrimestre:
LUIS JAVIER DEL VALLE MENDOZA - Grup: T10
NEKANE LOZANO HERNÁNDEZ - Grup: T10
GERMÁN ANIBAL PEREZ LLANOS - Grup: T10

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:
CGMUEQ-06. Have the capacity to analyze and synthesize the continuous progress of products, processes, systems and services using safety, economic viability, quality and environmental management criteria
CGMUEQ-10. Adapt to changes, being able to apply new and advanced technologies and other relevant developments, with initiative and entrepreneurial spirit

Transversal:
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

Exhibition classes and presentation of works
LEARNING OBJECTIVES OF THE SUBJECT

Specific:
CEMQ1. Apply knowledge of mathematics, physics, chemistry, biology and other natural sciences, obtained through study, experience, and practice, with critical reasoning to establish economically viable solutions to technical problems.
CEMQ9. Manage Research, Development and Technological Innovation, taking into account the transfer of technology and property and patent rights.
CEMQ13. Realization, presentation and defense, once all the credits of the syllabus have been obtained, from an original exercise carried out individually before a university court, consisting of a comprehensive project of Chemical Engineering of a professional nature in which the competences acquired in the teachings are synthesized.

Generic:
CGMQ4. Carry out the appropriate research, undertake the design and lead the development of engineering solutions, in new or unfamiliar environments, relating creativity, originality, innovation and technology transfer.
CGMQ6. Be able to analyze and synthesize the continuous progress of products, processes, systems and services using criteria of safety, economic viability, quality and environmental management.
CGMQ11. Possess the skills of autonomous learning to maintain and improve the skills of chemical engineering that allow the continuous development of the profession.

Transversal:
CT3. TEAMWORK: Being able to work as a member of an interdisciplinary team, either as a member or performing management tasks, in order to contribute to develop projects with pragmatism and sense of responsibility, assuming commitments taking into account the resources available.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>28,0</td>
<td>18.67</td>
</tr>
<tr>
<td>Self study</td>
<td>102,0</td>
<td>68.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>6,0</td>
<td>4.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>14,0</td>
<td>9.33</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

1. Biopolymers and bioplastics
   Description:
   Full-or-part-time: 2h
   Theory classes: 2h

2. Biomaterials and biocompatibility
   Description:
   Full-or-part-time: 2h
   Theory classes: 2h
### 3. Biostenibilidad and biodegradability

**Description:**

**Full-or-part-time:** 5h
Theory classes: 5h

### 4. Sustainable monomers

**Description:**

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

### 5. Sustainable polymers and bioplastics

**Description:**

**Full-or-part-time:** 5h
Theory classes: 5h

### 6. Nanostructured polymers and copolymers

**Description:**

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

### 7. Polymeric biomaterials

**Description:**

**Full-or-part-time:** 6h
Theory classes: 6h
8. Advanced bioplastics

**Description:**
New biocomposites based on bioplastics. Flexible and low migration bioplastics. Hybrid bioplastics. Sustainable coatings based on bioplastics: paints and plastic coatings.

**Full-or-part-time:** 5h
Theory classes: 5h

9. Bioplastics based on peptides and polypeptides

**Description:**

**Full-or-part-time:** 5h
Theory classes: 5h

10. Processing of biopolymers and bioplastics

**Description:**

**Full-or-part-time:** 6h
Theory classes: 6h

**GRADING SYSTEM**

\[ NC = \frac{(NP1 + NP2 + NP3)}{3} \]
Where NC is the course grade and NP1-NP3 are the marks of the three parts in which the subject is divided.

**EXAMINATION RULES.**

Exam: It consists of different theoretical and practical questions related to the content of the subject.

**BIBLIOGRAPHY**

**Basic:**