Course guides
295022 - FP - Fundamentals of Polymers

Unit in charge: Barcelona East School of Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.
Degree: BACHELOR’S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Compulsory subject).
Academic year: 2021 ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: MARIA LLUÍSA MASPOCH RULDU
Others:
Primer quadrimestre:
JONATHAN CAILOUX - M21, M22
VIOLETA DEL VALLE GARCÍA MASABET - M21, M22
MAGALI KLOTZ - M21, M22
MARIA LLUÍSA MASPOCH RULDU - M21, M22
ORLANDO ONOFRE SANTANA PEREZ - M21, M22

Segon quadrimestre:
JONATHAN CAILOUX - M11
VIOLETA DEL VALLE GARCÍA MASABET - M11
MAGALI KLOTZ - M11
MARIA LLUÍSA MASPOCH RULDU - M11
ORLANDO ONOFRE SANTANA PEREZ - M11

PRIOR SKILLS
General knowledge of chemistry

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEB-04. Understand the fundamental principles of general, organic and inorganic chemistry and apply them in engineering.
CEI-09. Understand the fundamentals of materials science, technology and chemistry. Understand the relationship between the microstructure, synthesis or processing and the properties of materials.

Transversal:
07 AAT N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.

TEACHING METHODOLOGY
MD1: Expository class with material available in digital campus
MD2: Seminars and activities deliverables
MD3: Conducting laboratory practices
LEARNING OBJECTIVES OF THE SUBJECT

1. Review the basic concepts of organic chemistry
2. Know the main reactions of polymerization
3. Learn how to calculate and determine the average molecular mass of polymers
4. Know the polymer identification techniques

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

<table>
<thead>
<tr>
<th>Principios de Química Orgánica</th>
</tr>
</thead>
</table>

Description:
Introduction
Main reactive groups
Attractive forces
Isomerías
Main reactions

Related activities:
Practices with molecular models

Full-or-part-time: 49h 40m

Practical classes: 15h
Laboratory classes: 2h
Guided activities: 1h
Self study: 31h 40m
### Polymers

**Description:**
- Basic definitions
- Polymerization reactions
- Molecular structure
- Polymerization systems
- Dimensions of the chain
- Identification of polymers
- Main reactions
- Dimensions of the chain
- Identification of polymers

**Related activities:**
1. Viscosymmetry
2. Obtaining thermoplastics (PA6.10)
3. Preparation PU foams
4. Identification by flame behavior
5. IR identification

**Full-or-part-time:** 105h 20m
- Practical classes: 30h
- Laboratory classes: 10h
- Guided activities: 2h
- Self study: 63h 20m

---

### GRADING SYSTEM

The final mark (Nf) will be calculated according to the following table:

<table>
<thead>
<tr>
<th>Type of evaluation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note deliverable activities (A)</td>
<td>10%</td>
</tr>
<tr>
<td>Lab note (P)</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam (EF)</td>
<td>70%</td>
</tr>
</tbody>
</table>

Final mark (Nf): 0.1 A + 0.2 P +0.7 EF

The re-evaluation replaces the final exam grade. To be able to submit to the re-evaluation, it is necessary to have attended all the laboratory practices and submitted the corresponding reports.

---

### BIBLIOGRAPHY

**Basic:**

---

### RESOURCES

**Other resources:**
- Presentations of the classes available in atenea
- Practice script available at atenea
- Script of the activities available in atenea