Course guide
230458 - QOB - Organic Chemistry and Biochemistry

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.
Degree: BACHELOR'S DEGREE IN ENGINEERING PHYSICS (Syllabus 2011). (Compulsory subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura

Others: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
2. Knowledge of the organic chemistry basis and their use in the production of complex materials and biological systems. Ability to develop the activity in a chemistry lab and produce compounds and/or materials.
1. Knowledge of the chemistry laws. Knowledge of the main chemical methods of producing materials and nanomaterials. Ability to conduct and analyze basic chemical reactions.

Generical:
3. ABILITY TO IDENTIFY, FORMULATE, AND SOLVE PHYSICAL ENGINEERING PROBLEMS. Planning and solving physical engineering problems with initiative, making decisions and with creativity. Developing methods of analysis and problem solving in a systematic and creative way.

Transversal:
2. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
4. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

Inside class: 2,6 ECTS. Seminal classes (theory + seminars) with the participation of the student. Homework (individual and/or team). Tutorial.
Outside class: 3,4 ECTS. Exercises and projects (theory or seminars).

LEARNING OBJECTIVES OF THE SUBJECT

- Justify the reactivity of the main organic functional groups.
- Define and explain the different basic biochemical functions that allows life to exist.
- Characterize chemical compounds with the most common structural identification techniques.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>65,0</td>
<td>43.33</td>
</tr>
<tr>
<td>Self study</td>
<td>85,0</td>
<td>56.67</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

1. INTRODUCTION TO ORGANIC COMPOUNDS

Description:

Full-or-part-time: 20h
Theory classes: 8h
Guided activities: 4h
Self study: 8h

2. ISOMERISM AND STEREOISOMERISM

Description:

Full-or-part-time: 16h
Theory classes: 6h
Guided activities: 4h
Self study: 6h

3. ALKANES AND CYCLOALKANES

Description:

Full-or-part-time: 10h
Theory classes: 4h
Guided activities: 2h
Self study: 4h

4. ALKENES AND ALKynes

Description:

Full-or-part-time: 8h
Theory classes: 4h
Self study: 4h
5. AROMATIC HYDROCARBONS

**Description:**

**Full-or-part-time:** 6h
Theory classes: 3h
Self study: 3h

6. HALOGENATED

**Description:**

**Full-or-part-time:** 8h
Theory classes: 4h
Self study: 4h

7. ALCOHOLS, PHENOLS AND ETHERS

**Description:**

**Full-or-part-time:** 10h
Theory classes: 4h
Guided activities: 2h
Self study: 4h

8. COMPOUNDS CARBONYL. ALDEHYDES AND KETONES

**Description:**

**Full-or-part-time:** 10h
Theory classes: 4h
Guided activities: 2h
Self study: 4h

9. CARBOXYLIC ACIDS AND DERIVATIVES

**Description:**

**Full-or-part-time:** 10h
Theory classes: 4h
Guided activities: 2h
Self study: 4h
10. AMINES AND RELATED NITROGEN COMPOUNDS

Description:
Nucleic acids: nitrogenous bases.

Full-or-part-time: 10h
Theory classes: 4h
Guided activities: 2h
Self study: 4h

11. SPECTROSCOPY AND STRUCTURAL DETERMINATION

Description:

Full-or-part-time: 22h
Theory classes: 12h
Guided activities: 2h
Self study: 8h

GRADING SYSTEM

Qualification will include a final exam (EF) and continuous evaluation including a mid-semester exam (EP) and the participation of the student in seminar classes (P). The final qualification will be calculated as follows: max(EF, 0.65*EF + 0.30*EP + 0.05*P)

BIBLIOGRAPHY

Basic: