230458 - QOB - Organic Chemistry and Biochemistry

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering
Academic year: 2019
Degree: BACHELOR’S DEGREE IN ENGINEERING PHYSICS (Syllabus 2011). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: MONTSERRAT GARCIA ALVAREZ
Others: JOSÉ IGNACIO IRIBARREN LACO

Degree competences to which the subject contributes

Specific:
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.
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.

General:
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.
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.
4. 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

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>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>65h</th>
<th>43.33%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study:</td>
<td></td>
<td>85h</td>
<td>56.67%</td>
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Last update: 02-07-2019
## Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INTRODUCTION TO ORGANIC COMPOUNDS</td>
<td>20h</td>
</tr>
<tr>
<td></td>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 4h</td>
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<tr>
<td></td>
<td>Self study : 8h</td>
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<thead>
<tr>
<th>Topic</th>
<th>Learning time:</th>
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<tbody>
<tr>
<td>2. ISOMERISM AND STEREOISOMERISM</td>
<td>16h</td>
</tr>
<tr>
<td></td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 4h</td>
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<tr>
<td></td>
<td>Self study : 6h</td>
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</tbody>
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<thead>
<tr>
<th>Topic</th>
<th>Learning time:</th>
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<tbody>
<tr>
<td>3. ALKANES AND CYCLOALKANES</td>
<td>10h</td>
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<tr>
<td></td>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 2h</td>
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<tr>
<td></td>
<td>Self study : 4h</td>
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<th>Learning time:</th>
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<tbody>
<tr>
<td>4. ALKENES AND ALKYNES</td>
<td>8h</td>
</tr>
<tr>
<td></td>
<td>Theory classes: 4h</td>
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<tr>
<td></td>
<td>Self study : 4h</td>
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</tbody>
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### 5. AROMATIC HYDROCARBONS

**Description:**

**Learning time:** 6h
- Theory classes: 3h
- Self study: 3h

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### 6. HALOGENATED

**Description:**

**Learning time:** 8h
- Theory classes: 4h
- Self study: 4h

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### 7. ALCOHOLS, PHENOLS AND ETHERS

**Description:**

**Learning time:** 10h
- Theory classes: 4h
- Guided activities: 2h
- Self study: 4h

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### 8. COMPOUNDS CARBONYL. ALDEHYDES AND KETONES

**Description:**

**Learning time:** 10h
- Theory classes: 4h
- Guided activities: 2h
- Self study: 4h
9. CARBOXYLIC ACIDS AND DERIVATIVES

Learning time: 10h
Theory classes: 4h  
Guided activities: 2h  
Self study: 4h

Description:
Amino acids and proteins.

10. AMINES AND RELATED NITROGEN COMPOUNDS

Learning time: 10h
Theory classes: 4h  
Guided activities: 2h  
Self study: 4h

Description:
Nucleic acids: nitrogenous bases.

11. SPECTROSCOPY AND STRUCTURAL DETERMINATION

Learning time: 22h
Theory classes: 12h  
Guided activities: 2h  
Self study: 8h

Description:

Qualification 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:**

