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.

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>85h</td>
<td></td>
<td>56.67%</td>
</tr>
</tbody>
</table>

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**Last update: 02-07-2019**
# Content

## 1. INTRODUCTION TO ORGANIC COMPOUNDS

**Learning time: 20h**
- Theory classes: 8h
- Guided activities: 4h
- Self study: 8h

**Description:**

## 2. ISOMERISM AND STEREOISOMERISM

**Learning time: 16h**
- Theory classes: 6h
- Guided activities: 4h
- Self study: 6h

**Description:**

## 3. ALKANES AND CYCLOALKANES

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

**Description:**

## 4. ALKENES AND ALKynes

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

**Description:**
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description</th>
<th>Learning time</th>
<th>Theory classes</th>
<th>Guided activities</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. AROMATIC HYDROCARBONS</td>
<td>Nomenclature, structure and physical properties. Procurement processes. Aromatic substitution reactions. Effect of substituents. Oxidation and combustion. Arens.</td>
<td>6h</td>
<td>3h</td>
<td></td>
<td>3h</td>
</tr>
<tr>
<td>6. HALOGENATED</td>
<td>Features and halogenated structure. alkyl halides. Physical and chemical properties. Nucleophilic substitution reactions. Elimination reactions. Organo-metallic compounds.</td>
<td>8h</td>
<td>4h</td>
<td></td>
<td>4h</td>
</tr>
<tr>
<td>7. ALCOHOLS, PHENOLS AND ETHERS</td>
<td>Nomenclature, structure and physical properties. natural products and procurement processes. chemical reactions of hydroxylated compounds. Dehydration of Alcohols. Acid-base characteristics. Ethers. Ethanol and phenol.</td>
<td>10h</td>
<td>4h</td>
<td>2h</td>
<td>4h</td>
</tr>
<tr>
<td>8. COMPOUNDS CARBONYL. ALDEHYDES AND KETONES</td>
<td>Structural characteristics of carbonyl compounds. Physical properties. Formation of acetals and hemiacetals. Keto-enol tautomerism. Aldol condensation. Redox reactions.</td>
<td>10h</td>
<td>4h</td>
<td>2h</td>
<td>4h</td>
</tr>
</tbody>
</table>
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}

### 9. CARBOXYLIC ACIDS AND DERIVATIVES

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

**Description:**  

### 10. AMINES AND RELATED NITROGEN COMPOUNDS

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

**Description:**  

### 11. SPECTROSCOPY AND STRUCTURAL DETERMINATION

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

**Description:**  
### Bibliography

#### Basic:

