230453 - QI - Inorganic Chemistry

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering
Academic year: 2017
Degree: BACHELOR'S DEGREE IN ENGINEERING PHYSICS (Syllabus 2011). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Iribarren Laco, Jose Ignacio
Others: Urpi Garriga, Lourdes

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.

General:
4. 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. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
3. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
1. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 1. Analyzing the world’s situation critically and systemically, while taking an interdisciplinary approach to sustainability and adhering to the principles of sustainable human development. Recognizing the social and environmental implications of a particular professional activity.

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

- Understand and apply the basic concepts of Chemistry related to the atomic and molecular structure and the properties of matter.
- Apply the principles of chemical transformations to the knowledge and calculation of transformed reactants and products obtained.
- Justify the applications of common inorganic compounds.
# Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 65h 43.33%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study:</td>
<td>85h 56.67%</td>
</tr>
</tbody>
</table>
# Content

## Utility of the periodic table

**Learning time:** 28h  
Theory classes: 12h  
Guided activities: 4h  
Self study : 12h

**Description:**  
Organization of the periodic table. Periodic properties. Periodicity and physical and structural properties. Relationships between structure and properties.

## The covalent bond

**Learning time:** 20h  
Theory classes: 10h  
Self study : 10h

**Description:**  

## The metallic bond

**Learning time:** 16h  
Theory classes: 8h  
Self study : 8h

**Description:**  

## The ionic bond

**Learning time:** 10h  
Theory classes: 5h  
Self study : 5h

**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: $\max\{EF, 0.65 \times EF + 0.30 \times EP + 0.05 \times P\}$

<table>
<thead>
<tr>
<th>Chemical reactions</th>
<th><strong>Learning time:</strong> 24h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 8h</td>
</tr>
<tr>
<td></td>
<td>Self study : 8h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>Acids and bases</th>
<th><strong>Learning time:</strong> 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 4h</td>
</tr>
<tr>
<td></td>
<td>Self study : 8h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>Oxidation and reduction</th>
<th><strong>Learning time:</strong> 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 4h</td>
</tr>
<tr>
<td></td>
<td>Self study : 8h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>Organometallic compounds</th>
<th><strong>Learning time:</strong> 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study : 6h</td>
</tr>
</tbody>
</table>

**Description:**
The organometallic bond. Types of organometallic compounds.
Bibliography

Basic:


Complementary:
