Course guide
240014 - 240014 - Chemistry I

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: BACHELOR’S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: ANA MARIA SASTRE REQUENA

Others: Corcho Sanchez, Francisco Jose
         Gonzalez Fernandez, Oscar
         Lalueza Baro, Juana
         Pastor Castillo, Maria Vicenta
         Ruiz Planas, Montserrat
         Sastre Requena, Ana Maria

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

TEACHING METHODOLOGY

The module consists of lectures in which the professor presents the learning objectives related with the different contents and later a resolution of practical examples. Active participation is encouraged during the resolution of practical cases, while proposing a large amount of numerical problems in which students are presented with real cases related with the chemical environment.

During the course, students are provided with learning material and tools in order to guide their learning process and therefore consolidate knowledge on chemistry which is achieved during the course.

LEARNING OBJECTIVES OF THE SUBJECT

The module’s general objective is to establish a chemical basis necessary to interpret the most important chemical reactions which take place in aqueous dissolution and to apply in the Chemical Industry and Environment.

At the end of the module, students should be able to:
1. Predict the reactivity and stability of the most common chemical inorganic composites.
2. Correctly write chemical reactions differentiating those which take place in chemical balances.
3. Use the corresponding equations in the mass and charge balances as well as the necessary thermodynamic constants to interpret chemical balances.
5. Applying calculus of balanced systems in environment’s examples and in chemical industry examples.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>56.0</td>
<td>37.33</td>
</tr>
<tr>
<td>Hours small group</td>
<td>4.0</td>
<td>2.67</td>
</tr>
<tr>
<td>Self study</td>
<td>90.0</td>
<td>60.00</td>
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</tbody>
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Total learning time: 150 h

CONTENTS

**TOPIC 1. Chemical fundamentals**

**Description:**

**Related competencies:**
CE4. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

**Full-or-part-time:** 25h
Theory classes: 10h
Self study: 15h

**TOPIC 2. Acid-base reactions**

**Description:**

**Related competencies:**
CE4. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

**Full-or-part-time:** 40h
Theory classes: 8h
Practical classes: 8h
Self study: 24h
TOPIC 3. Formation of complexes in dissolution

Description:

Related competencies:
CE4. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

Full-or-part-time: 25h
Theory classes: 5h
Practical classes: 5h
Self study: 15h

TOPIC 4. Dissolution and precipitation

Description:

Related competencies:
CE4. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

Full-or-part-time: 30h
Theory classes: 6h
Practical classes: 6h
Self study: 18h

TOPIC 5. Redox reactions

Description:

Related competencies:
CE4. Capacity to understand and apply basic knowledge principles of general chemistry, organic and inorganic chemistry and their engineering applications.

Full-or-part-time: 30h
Theory classes: 6h
Practical classes: 6h
Self study: 18h

ACTIVITIES

(ENG) PROVA AVALUACIÓ CONTINUADA AC

Full-or-part-time: 1h
Self study: 1h
GRADING SYSTEM

The final mark (NF) will be calculated according to:

\[ NF = \max (NF, 0,2 \times AC + 0,2 \times AC + 0,6 \times EF) \]

1) Continuous evaluation mark: AC
2) Partial exam mark: EP
3) Final Exam mark: EF

The reassessment mark (ReAv) will replace the final exam mark.
Final mark will be calculated according to: \( NF = 1.0 \times \text{ReAv} \)

EXAMINATION RULES.

Both in continuous evaluation tests and in the partial and final exams, and in the reassessment exam, it is necessary to have a calculator. It will not be possible to use notes or any type of formulary under any circumstance.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Other resources:
In the ATENEA's platform, more information relative to the laboratory practice, questionnaires, self-evaluation multiple choice tests.