Course guides
220087 - Q2 - Chemistry II

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.
Degree: BACHELOR’S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
Academic year: 2020  ECTS Credits: 6.0  Languages: Catalan

LECTURER

Coordinating lecturer: FRANCESC TORRADES CARNÉ
Others: JOSEP MARIA DAGÀ MONMANY
FRANCESC XAVIER CAÑAVATE AVILA
ELISABET QUINTANA VILAJUANA

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. An understanding of the basic principles of general, organic and inorganic chemistry and the ability to apply this knowledge in engineering

TEACHING METHODOLOGY

It will include:
- Presencial sessions of contents exhibition.
- Presencial sessions of practical work.
- Sessions of experimental chemistry in the laboratory.
- Autonomous work of study and realization of exercises.
In the content exhibition sessions the teaching staff will introduce theoretical bases of subject, concepts, methods and results to facilitate their understanding.
In the problem sessions in the classroom, teaching staff will guide to the students in the application of theoretical concepts for problems resolution. They will propose exercises which students have to solve in order to guarantee the contact and utilization of the basic tools for the resolution of problems. 
The laboratory sessions will be structured in small groups. In these classes students take contact with the chemical laboratory and with experimental methods.
The students have to work the material provided by the teaching staff in an autonomous way in order to assimilate and fix concepts. The teaching staff will provide a plan of study and of follow-up of activities (ATENEA).
LEARNING OBJECTIVES OF THE SUBJECT

Broadening the knowledge of chemistry that the students have attained previously, as well as introducing new concepts which give to students a uniform and common chemical basis. It will be necessary to follow some subjects which they will do later. At the end of the course students will have to know the laws that govern the behaviour of solutions, the most important types of reactions in aqueous solutions; and to know electrochemistry fundamentals and their applications. They also will have to know some aspects of metals and not metals chemistry, as well as the structure, reactivity and applications of the main organic compounds.

To relate and to apply the theoretical concepts, in the numeric problems and in the realization of laboratory experiments.

To provide the tools because the students are capable of searching information, select it and reflect about it creating some own opinions.

To recognise the Chemistry as an experimental science and fixing knowledge from the experimentation in the laboratory.

To recognise the importance of the Chemistry and the Chemical Technology in the well-being of the society. To know the impact of the industrial activities in the environment and to understand that many environmental problems need a strong chemical knowledge, in order to be solved.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>32,0</td>
<td>21.33</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>14,0</td>
<td>9.33</td>
</tr>
<tr>
<td>Hours small group</td>
<td>14,0</td>
<td>9.33</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

1. Solutions

**Full-or-part-time:** 21h
Theory classes: 4h
Practical classes: 3h
Laboratory classes: 2h
Self study: 12h

2. Reactions in aqueous solutions

**Full-or-part-time:** 36h
Theory classes: 9h
Practical classes: 3h
Laboratory classes: 3h
Self study: 21h

3. Electrochemistry

**Full-or-part-time:** 23h
Theory classes: 4h
Practical classes: 2h
Laboratory classes: 3h
Self study: 14h
### 4. Chemistry of metals and no metals

**Full-or-part-time:** 17h  
Theory classes: 4h  
Practical classes: 1h  
Self study : 12h

### 5. Environmental chemistry

**Full-or-part-time:** 16h  
Theory classes: 4h  
Practical classes: 2h  
Self study : 10h

### 6. Organic chemistry

**Full-or-part-time:** 37h  
Theory classes: 7h  
Practical classes: 3h  
Laboratory classes: 6h  
Self study : 21h

### ACTIVITIES

#### ACTIVITY 1: THEORY CLASSES

**Full-or-part-time:** 64h  
Theory classes: 26h  
Self study: 38h

#### ACTIVITY 2: EXERCISE CLASSES

**Full-or-part-time:** 46h  
Practical classes: 14h  
Self study: 32h

#### ACTIVITY 3: CHEMISTRY LABORATORY

**Full-or-part-time:** 34h  
Laboratory classes: 14h  
Self study: 20h
ACTIVITY 4: PARTIAL EXAM

Description:

Full-or-part-time: 1h 30m
Theory classes: 1h 30m

ACTIVITY 5: FINAL EXAM

Description:

Full-or-part-time: 2h 30m
Theory classes: 2h 30m

ACTIVITAT 6: CONTROL EXERCISE

Description:

Full-or-part-time: 2h
Theory classes: 2h

GRADING SYSTEM

Global qualification = 0,20 x N1P + 0,50 x N2P + 0,20 x NL + 0,10 x N3P

Where:
N1P: corresponds to partial exam qualification
N2P: corresponds to final exam qualification
NL: corresponds to laboratory qualification. Activity 3 of this guide.
NP3: corresponds to control qualification in class.

The non satisfactory results in the partial exam qualification (N1P) could be recovered in the final exam qualification (N2P). In this case, global qualification will be 0,70 x N2P + 0,20 x NL +0,10 x N3P; when N2P > N1P.

EXAMINATION RULES.

Each group can ask doubts to teachers staff of the subject as many times as they need it.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Hyperlink:
- http://www.pearsonhighered.com
- http://upcommons.upc.edu
- http://www.webelements.com
- http://www.edu365.cat
- http://www.chemdex.org