Course guide  
240027 - 240027 - Chemistry II  

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

Degree: Academic year: 2023  
ECTS Credits: 6.0  
Languages: Catalan, Spanish  

LECTURER  
Coordinating lecturer: Ana Maria Sastre Requena  
Others: Almajano Pablos, Maria Pilar  
Corcho Sanchez, Francisco Jose  
Gonzalez Fernandez, Oscar  
Lalueza Baro, Juana  
Pastor Castillo, Maria Vicenta  
Sastre Requena, Ana Maria  
Martinez Rodriguez, Maria  

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.  

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.  
4. Calculate the concentrations of different species in an aqueous dissolution for balanced reactions: acid-base, complexation,  
solubility and oxidation-reduction.  
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>Laboratory classes</td>
<td>4,0</td>
<td>6.67</td>
</tr>
<tr>
<td>Theory classes</td>
<td>56,0</td>
<td>93.33</td>
</tr>
</tbody>
</table>

Total learning time: 60 h
## CONTENTS

### TOPIC 1. Chemical Kinetics

**Description:**
Chemical kinetics. Definitions. Rate law of a chemical reaction. Rate constant. Rate equations.

**Full-or-part-time:** 15h  
Theory classes: 3h  
Practical classes: 3h  
Self study : 9h

### TOPIC 2. Chemical Equilibrium

**Description:**

**Full-or-part-time:** 10h  
Theory classes: 2h  
Practical classes: 2h  
Self study : 6h

### TOPIC 3: Acid-base reactions

**Description:**

**Full-or-part-time:** 40h  
Theory classes: 7h  
Practical classes: 7h  
Laboratory classes: 2h  
Self study : 24h

### TOPIC 4. Formation of complexes in dissolution

**Description:**

**Full-or-part-time:** 16h 30m  
Theory classes: 3h  
Practical classes: 3h  
Laboratory classes: 0h 30m  
Self study : 10h
TOPIC 5. Dissolution and precipitation

Description:

Full-or-part-time: 31h 30m
Theory classes: 6h
Practical classes: 6h
Laboratory classes: 0h 30m
Self study : 19h

TOPIC 6. Redox reactions

Description:

Full-or-part-time: 32h
Theory classes: 6h
Practical classes: 6h
Laboratory classes: 1h
Self study : 19h

TOPIC 7: Organic Chemistry: applications

Description:
Applications of organic reactions

Full-or-part-time: 5h
Theory classes: 2h
Self study : 3h

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:

\[ NF = \max. (EF, 0.2*EP + 0.2*PAC + 0.05*NP + 0.55*EF) \]

1) Continuous evaluation mark: PAC
2) Partial exam mark: EP
3) Laboratori mark: NP
4) Final exam mark: EF

La nota final de Reavaluació es calcularà segons: \( NF = 1.0*ReAv \)
Nota de l'examen de Reavaluació: ReAv

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: \( NF = 1.0 *ReAv \)

**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.