

## 29904 - Chemistry

### Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Course	1
Period	Half-yearly
Subject Type	Basic Education
Module	---

### 1. Basic info

#### 1.1. Recommendations to take this course

#### 1.2. Activities and key dates for the course

### 2. Initiation

#### 2.1. Learning outcomes that define the subject

#### 2.2. Introduction

### 3. Context and competences

#### 3.1. Goals

#### 3.2. Context and meaning of the subject in the degree

#### 3.3. Competences

#### 3.4. Importance of learning outcomes

### 4. Evaluation

Students have to show they have achieved the results of the learning process through the following activities of evaluation:

1. Laboratory sessions. The fulfillment of scheduled tasks will be evaluated. A written exam and/or the presentation of the corresponding session reports will also be required (10% of the final mark).
2. Four deliverables of exercises (8%).
3. Work in group (2-3 students) and oral presentation (9%).
4. First partial exam from lesson 1 (Introduction) to lesson 6 (Enthalpy, free energy and chemical equilibrium) (33%). If the score is below 5 then the student should be re-examined of the mentioned lessons.
5. Second partial exam (40%), coincident with final exam (73%). This call will be adapted to evaluate 100% of the matter (including laboratory practices).

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Activities	Weighing
Lab practices	10%
Deliverables	8%
Work in group	9%
First partial exam	33%
Second partial exam	40%
Total	100%

To overpass the second partial exam, the score has to be 4 or higher, as long as the other components of the evaluation (practices, deliverables, work in group and first partial exam) produce a score of 5 or higher. In the final exam, students will have the opportunity of re-examination of lab work (even to try to enhance the corresponding score). However, there will be not a possibility of enhancing the scores related to both deliverables and work in group. In any event, the student will receive the highest weighed score result of including or not the scores of deliverables and work in group.

### 5. Activities and resources

#### 5.1. General methodological presentation

The learning process is based on:

- Participative theoretical lectures
- Sessions to solve questions and exercises
- Programmed works and presentations in small groups of students
- Group programmed tutorials for complementary activities (including exercises)
- Individual tutorials
- Continuous evaluation along the semester with feedback for the student
- Laboratory sessions

#### 5.2. Learning activities

**Theoretical lectures and resolution of exercises and questions in the classroom** . The Reprography Service of EINA makes available to students a book with exercises (not solved but with correct answers). This book includes all the theoretical lessons of the course.

**In addition, the activities in the classroom will be complemented with the following laboratory sessions :**

1. Introduction. Identification and handling of common lab material.
2. Kinetics of the reaction between peroxodisulfate and iodide ions.
3. Electrolysis of aqueous solution of potassium iodide.
4. Limiting reactant of a chemical reaction.

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### 5. Acid-base and complex formation equilibria.

Students will have available in the Reprography Service of EINA a book with the guides to prepare and carry out the lab sessions.

### 5.3.Program

Lesson 1. Introduction (1h)

Lesson 2. Introduction to the nomenclature of chemical compounds (2h)

Lesson 3. Chemical reactions. Types and stoichiometry (3 h)

Lesson 4. Units and mass balances (5 h)

Lesson 5. Chemical thermodynamics (3 h)

Lesson 6. Enthalpy, free energy and chemical equilibrium (5 h)

Lesson 7. Chemical equilibrium: phase change (4 h)

Lesson 8. Physical properties of solutions (5 h)

Lesson 9. Acid-base equilibria (3 h)

Lesson 10. Solubility and complex formation equilibria (3 h)

Lesson 11. Electrochemistry (6 h)

Lesson 12. Kinetics of chemical reactions (5 h)

Durations of lessons are an estimate.

### 5.4.Planning and scheduling

Theoretical and exercise lectures and lab sessions are given following the schedule established by EINA before the beginning of the current academic course. Every teacher will inform the students about his/her individual tutorial schedule. Other activities will be planned as a function of the number of students early enough.

### 5.5.Bibliography and recommended resources

**BB**

Atkins, Peter William : Principios de química : los caminos del descubrimiento /

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Geoffrey Herring ; con la colaboración de  
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