

## 29914 - Chemistry extension II

### Syllabus Information

**Academic Year:** 2020/21

**Subject:** 29914 - Chemistry extension II

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 435 - Bachelor's Degree in Chemical Engineering

**ECTS:** 6.0

**Year:** 2

**Semester:** First semester

**Subject Type:** Compulsory

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

#### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

For both subjects Inorganic Chemistry and Organic Chemistry, in the middle of the term, a midterm exam will be carried out, that will represent 50% of the final grade. At the end of the term, students will do a final exam will include questions corresponding to the topics of the midterm exam, which will represent 50% of the final grade, and questions corresponding to the remaining topics included in the subject, which will represent 50% of the final grade. The questions corresponding to the topics included in the midterm exam, will have to be answered by students who have had a grade lower than 5 in the midterm exam, or by students who wish to improve the final note.

### 4.Methodology, learning tasks, syllabus and resources

#### 4.1.Methodological overview

The learning process that is designed for this subject is based on the following:

- Theory classes as participative and interactive lectures (4.5 ECTS).
- Participative seminars (1.5 ECTS).
- Personalized tutorials.

Students matriculated in the course can log in to contents and materials in the space allocated to the subject in the Moodle plat

#### 4.2.Learning tasks

The available program that will assist the student to achieve the expected results involves the following activities...

Theoretical sessions as participative and interactive lectures, participative seminar sessions and personalized tutoring classes.

#### INORGANIC CHEMISTRY

UNIT I: AN INTRODUCTION TO THE STUDY OF INORGANIC CHEMISTRY.

UNIT II: REPRESENTATIVE ELEMENTS.

UNIT III: METALLURGY. INTRODUCTION TO THE STUDY OF THE TRANSITION ELEMENTS.

#### ORGANIC CHEMISTRY

UNIT IV: INTRODUCTION TO THE STUDY OF ORGANIC CHEMISTRY.

UNIT V: STRUCTURE AND PROPERTIES OF ORGANIC COMPOUNDS.

UNIT VI: REACTIVITY OF ORGANIC COMPOUNDS.

### 4.3. Syllabus

The course will address the following topics:

#### INORGANIC CHEMISTRY

##### UNIT I

AN INTRODUCTION TO THE STUDY OF INORGANIC CHEMISTRY:

- HISTORICAL EVOLUTION OF THE INORGANIC CHEMISTRY.
- REACTIONS IN INORGANIC CHEMISTRY.
- AN INTRODUCTION TO THE STUDY OF THE ELEMENTS: Study of the variation of the periodic properties.

##### UNIT II

REPRESENTATIVE ELEMENTS: Occurrence and abundance, extraction and uses, properties, and principal compounds.

- HYDROGEN.
- THE NOBLE GASES.
- HALOGENS.
- CHALCOGENS.
- THE GROUP 15 ELEMENTS.
- THE GROUP 14 ELEMENTS.
- THE GROUP 13 ELEMENTS.
- GROUP 1: THE ALKALI METALS
- GROUP 2: THE ALKALINE EARTH ELEMENTS.

##### UNIT III

METALLURGY. INTRODUCTION TO THE STUDY OF THE TRANSITION ELEMENTS.

- CONCENTRATION OF ORES. TYPES OF METALLURGICAL PROCESSES.
- GENERAL PROPERTIES OF THE TRANSITION ELEMENTS: Applications in the chemical industry.

#### ORGANIC CHEMISTRY

##### UNIT IV

INTRODUCTION TO THE STUDY OF ORGANIC CHEMISTRY:

- HISTORICAL EVOLUTION OF CARBON COMPOUNDS CHEMISTRY.
- AN INTRODUCTION TO THE STUDY OF IMPORTANT FAMILIES OF ORGANIC COMPOUNDS.

##### UNIT V

STRUCTURE AND PROPERTIES OF ORGANIC COMPOUNDS:

- THE STRUCTURE OF IMPORTANT FAMILIES OF ORGANIC COMPOUNDS, ISOMERISM (CONSTITUCIONAL ISOMERS AND STEREOISOMERS), CONFORMATIONAL ANALYSIS.
- PHYSICAL, ACID-BASE AND SPECTROSCOPIC PROPERTIES OF ORGANIC COMPOUNDS.

##### UNIT VI

REACTIVITY OF ORGANIC COMPOUNDS.

- THE MAIN TYPES OF ORGANIC REACTIONS. SYNTHESIS AND REACTIVITY OF ALIPHATIC AND AROMATIC HYDROCARBONS. SYNTHESIS AND REACTIVITY OF CARBONILIC COMPOUNDS.

### 4.4. Course planning and calendar

## Planning and scheduling

Schedules of lectures will coincide with the officially established and will be available at: <https://eina.unizar.es/>.

The calendar will be established in coordination with the rest of the maters at beginning of course. The presentation of works will be notified in advance, in the Moodle page for the course, on the platform Moodle at the University of Zaragoza, <https://moodle2.unizar.es/add/>.

| UNITS   | ACTIVITY  | HOURS | GROUPS |
|---|-----------|-------|--------|
| An introduction to the study of the Inorganic Chemistry<br><b>(UNIT I)</b>            | Theory    | 2     | 1      |
|   | Questions | 1     | 1      |
|   | Tutoring  | 1     | 1      |
| Representative elements<br><b>(UNIT II)</b>   | Theory    | 18    | 1      |
|   | Questions | 2     | 1      |
|   | Tutoring  | 2     | 1      |
| Metallurgy. Introduction to the study of the Transition elements<br><b>(UNIT III)</b> | Theory    | 2     | 1      |
|   | Questions | 1     | 1      |
|   | Tutoring  | 1     | 1      |
| Introduction to the study of the Organic Chemistry<br><b>(UNIT IV)</b>                | Theory    | 2     | 1      |
|   | Questions | 1     | 1      |
|   | Tutoring  | 1     | 1      |
| Structure and properties of Organic compounds<br><b>(UNIT V)</b>                      | Theory    | 12    | 1      |
|   | Questions | 2     | 1      |
|   | Tutoring  | 2     | 1      |
| Reactivity of Organic compounds<br><b>(UNIT VI)</b>                                   | Theory    | 8     | 1      |
|   | Questions | 2     | 1      |
|   | Tutoring  | 2     | 1      |

| ACTIVITY             | PRESENCIAL (hours) | HOMEWORK | TOTAL |
|----------------------|--------------------|----------|-------|
| Theoretical sessions | 44                 | 66       | 110   |
| Seminars             | 9                  | 8        | 8     |
| Tutoring classes     | 9                  | 8        | 8     |
| Examinatios          | 6                  |          | 6     |
| TOTAL                | 68                 | 82       | 150   |

## 4.5. Bibliography and recommended resources

[http://biblos.unizar.es/br/br\\_citas.php?codigo=29914&year=2019](http://biblos.unizar.es/br/br_citas.php?codigo=29914&year=2019)