

29803 - Chemistry

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura 326 - Escuela Universitaria Politécnica de Teruel
Degree	440 - Bachelor's Degree in Electronic and Automatic Engineering 444 - Bachelor's Degree in Electronic and Automatic 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

5.Activities and resources

5.1.General methodological presentation

The learning process of is based on...

This subject is devised to promote the active learning of the students. The theoretical part is planned as general introductions to each unit and they will be completed with more activities, questions, problems, tutorial classes and laboratory sessions.

5.2. Learning activities

The program proposed to the students contains the following activities...

Theoretical sessions and problem solving (5 credits).

The magistral class will use both oral exposition and TICs. The students should participate actively on problem solving.

Laboratory sessions (1 credit)

The laboratory sessions will be oriented to the student to use the laboratory material and to develop their capacities both deductive and communicative and also team work skills. Moreover, the security norms and the correct manipulation of residues will be taken in to account.

In EINA (Zaragoza):

- **Laboratory session 1:** The study of the physical and chemical properties of several solid compounds based on their chemical structure.
- **Laboratory session 2:** Chemical balance
- **Laboratory session 3:** Electrochemistry. 3.1. Electrolysis of potassium iodide solution. 3.2. Interconversion of energy: solar panel, electrolyser and fuel cell.

In EUP (Teruel):

- **Laboratory Session 1:** Introductory session. Handling of lab material and equipment. Titration.
- **Laboratory Session 2:** Electrolysis of an aqueous solution (KI)
- **Laboratory Session 3:** Acid-base equilibrium. Complex formation. Hardness of water.

5.3. Program

1. Chemical concepts I : Fundamental laws. Quantum Model. Quantum atom. Properties of matter. Phases of matter. Stoichiometry of chemistry reactions.

2. Chemical concepts II : Electronic structure of atoms. Periodic Table. Periodicity. Bonding: ionic bonding, covalent bonding. Metallic bonding. Bonding theories. Intermolecular bonds. Naming substances. Formulas.

3. Chemistry thermodynamics : Energy of the chemistry reactions. Enthalpy. Additivity of the enthalpies. Entropy. Bond energy. Free energy.

4. Chemical kinetics . Reaction rates. Factors affecting reaction rates. Reaction mechanisms.

5. Chemical equilibria. Chemical equilibria law. Chemical equilibria constant. Le Chatelier's Principle. Acid-base equilibrium. Solutions in equilibrium. Heterogeneous equilibria. Factors affecting chemical equilibria.

6. Electrochemistry. Electrolysis. Galvanic cells

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7. Industrial Organic and Inorganic Chemistry Materials: Metals. Semiconductors, insulators, ceramic materials, superconductors, polymers, biomaterials, silica panels, liquid crystals, light emission diodes, nanoparticles, carbon nanotubes.

5.4.Planning and scheduling

Lab and class sessions are planned according to the published schedule (see Center website). This schedule is published prior to the beginning of the course in September.

Each professor will publish his/her tutorials schedule.

The rest of the scheduled activities will be planned according to the number of students.

5.5.Bibliography and recommended resources