

29604 - Chemistry

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	430 - Bachelor's Degree in Electrical Engineering
ECTS	6.0
Course	1
Period	Half-yearly
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

To have acquired the competitions own to the previous educational stages

1.2.Activities and key dates for the course

The detailed schedule of the activities to be developed will be established once the University and the Center have approved the academic calendar (which could be consulted in the web of the center)

2.Initiation

2.1.Learning outcomes that define the subject

To pass this subject the student must demonstrate the following results...

He/she handles the basic principles of general chemistry, organic chemistry and inorganic chemistry.

He/she handles the basic laws that regulate the reactions: thermodynamics, kinetics and equilibrium

He/she solves exercises in a complete and reasoned way

He/she suitably applies the theoretical concepts in the laboratory by means of a correct and sure use of the basic material and equipments

He/she uses a rigorous language in chemistry

He/she suitably presents and discusses data and results

2.2.Introduction

Brief presentation of the subject

29604 - Chemistry

In the subject "Chemistry" the knowledge acquired by the students during the previous studies are homogenized and new concepts are introduced which are considered to be basic to adapt the level of his/her knowledges to the starting needs for the subjects included in the subsequent courses. The field of study of this subject are the basic principles of chemistry necessary in engineering: composition and properties of the matter, and thermodynamic and kinetical aspects of the chemical reactions.

3.Context and competences

3.1.Goals

The subject and its expected results meet the following proposals and goals:

The aim is that the students would acquire a general view of the chemistry and of its importance in our society and would be able to apply the theoretical and practical knowledge of chemistry in the development of his/her profession as industrial engineer.

3.2.Context and meaning of the subject in the degree

This subject is programmed in the first semester of the first course of the degree in Electrical Engineering and belongs to the module of basic training of the degrees in the branch of Industrial Engineering. The basic concepts learnt in this subject will serve as a basis for other subjects of subsequent courses like Technical thermodynamics, Foundations of transmission of heat, Materials engineering and Environmental engineering.

3.3.Competences

When passing the subject the student will be more competent to...

Solve problems and take decisions with initiative, creativity and critical reasoning (C4)

Learn in a continued way and develop strategies for an autonomous learning (C11)

Understand the principles of basic knowledge of general chemistry, organic chemistry and inorganic chemistry and apply them to engineering (C15)

3.4.Importance of learning outcomes

They provide tools for subsequent learnings and for the professional activity of electrical engineers

4.Evaluation

The student should show that he/she has reached the expected learning results by means of the following activities of evaluation

Written exam of nomenclature of Inorganic Chemistry and Organic Chemistry. The mark will range between 0 and 10

29604 - Chemistry

points and will suppose the 10 % of the final mark on the subject.

Written exam comprising definitions, questions of multiple answer, and theoretical questions of open answer. The mark will range between 0 and 10 points and will suppose the 40 % of the final mark in the subject.

Written exam to evaluate the student skills in the resolution of problems. The mark will range between 0 and 10 points and will suppose the 40 % of the final mark in the subject.

Realisation of practices of laboratory, delivery of a report for each practice according to the guidelines indicated at the beginning of each session, and realisation of a written exam. The mark in this part will range between 0 and 10 points and will suppose the 10 % of the final mark in the subject..

Procedure of evaluation of the subject

For the evaluation of the subject, a procedure of GLOBAL evaluation will be followed.

This will take place in each one of the two announcements of the subject, in the period fixed and programmed by the centre for the realisation of examinations and will consist of several written exams (exam of Nomenclature (10%), exam of Theory (40%) and exam of Problems (40%)).

The mark of practices (10%) will be obtained during the realisation of the sessions of practices of laboratory, according to the calendar fixed by the centre for them. The mark of practices will be calculated according to the following equation:

$$\text{Practices mark} = 0,3 \times \text{exam mark} + 0,7 \times \text{laboratory mark}$$

A minimum mark of 3.0 points in the written exam of practices is required to apply the previous equation. If this mark is not reached, it will be considered that the student has failed in the part of practices. If the student has not made the practices of laboratory, in addition to the written exams previously indicated, he/she should do a practices exam in the laboratory, in which it will carry out one experience related with those programmed in the sessions of laboratory. This exam will suppose the 10% of the final mark.

To pass the subject it will be necessary to have a minimum note of 4.0 points in each one of the exams as well as in the practices, and a minimum average mark of 5.0 points.

5. Activities and resources

5.1. General methodological presentation

The learning process designed for this course is based on:

The subject is planned to improve the active learning of the students so that the theoretical classes are conceived as general introductions to each chapter, introductions that will be completed afterwards by the rest of proposed activities,

29604 - Chemistry

including the resolution of questions and problems, the assistance to tutoring sessions and the realisation of practices of laboratory

5.2.Learning activities

The program offered to the student in order to help him/her to attain the expected results consist of the following activities...

Sessions of both theory and solution of problems: (5,0 credits)

Lectures for the oral transmission of information with the support of TIC's will be mainly used by means. In the classes of solution of problems the participation of the student will be encouraged.

Practices of laboratory (1,0 credits)

The practices of laboratory will be oriented towards the acquisition by the student of skills in handling the material of laboratory as well as to develop his/her deduction, communication, team working and analysis abilities, communicative. Besides, special attention will be paid to the importance of security guidelines in the laboratory and to the correct handling of wastes.

Course of the subject in the platform Moodle 2.0.

Academic tutoring sessions

Possibility for students of 1st course of the Degree of following the subject "Gestión de la Información para el Grado en Ingeniería Química" (nivel básico)" managed by the Biblioteca Hypatia.

5.3.Program

The program of theory consists of 10 chapters:

Chapter 1. Periodic table and properties

Chapter 2. Chemical nomenclature

Chapter 3. Chemical bonds

Chapter 4. States of aggregation of the matter

Chapter 5. Chemical reactions and solutions

Chapter 6. Termochemistry

29604 - Chemistry

Chapter 7. Chemical thermodynamics

Chapter 8. Chemical equilibrium

Chapter 9. Chemical kinetics

Chapter 10. Electrochemistry

The program of practices of laboratory consists of three sessions:

Session 1. Security in the laboratory. Study of solids in function of the type of bond

Session 2. Chemical equilibrium

Session 3. Electrolysis. Energy interconversor.

5.4.Planning and scheduling

Schedule of classroom teaching and work presentation

The lectures, sessions for solving problems and sessions of practices in the laboratory will be given according to schedule established by the Centre which is published prior to the date of beginning of the course.

Each professor will inform of his/her schedule of tutoring sessions, schedule that also will be available in the web of the centre.

5.5.Bibliography and recommended resources

Bibliography can be found in <http://psfunizar7.unizar.es/br13/eGrados.php?id=220>