29904 - Chemistry

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Year	1
Semester	Half-yearly
Subject Type	Basic Education
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

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.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

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 tasks

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.
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.Syllabus

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.Course planning and calendar

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

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	química : los caminos del descubrimiento / Peter Atkins, Loretta Jones . - 5ª ed. Buenos Aires : Editorial médica panamericana, D.L. 2012
BB	Chang, Raymond. Fundamentos de química / Raymond Chang ; adaptación Pedro Ibarra Escutia ; revisión técnica Isaías de la Rosa Gómez . México D. F. : McGraw-Hill/Interamericana, cop. 2011
BB	Coronas Ceresuela, Joaquín. Química básica para ingenieros / Joaquín Coronas Ceresuela . 1ª ed. Zaragoza : Prensas de la Universidad de Zaragoza, 2013
BB	Introducción a la ingeniería química / Editor Guillermo Calleja Pardo ; Autores Guillermo Calleja Pardo...[et al.]. Madrid : Síntesis, D.L. 1999
BB	López Cancio, José Antonio. Problemas de química / José Antonio López Cancio, con la colaboración de Antonio Vera Castellano . [1a ed.] Madrid [etc.] : Prentice Hall, 2000
BB	Peterson, W. R. : Nomenclatura de las sustancias químicas / W. R. Peterson . - 3ª ed. Barcelona [etc.] : Reverté, D. L. 2013
BB	Petrucci, Ralph H.. Química general / Ralph H. Petrucci, William S. Harwood, F. Geoffrey Herring ; con la colaboración de Scott S. Perry ; traducción, Concepción Pando Gª-Pumarino, Nerea Iza Cabo ; revisión técnica, Juan A. Rodríguez Renuncio . 8ª ed., reimp. Madrid : Prentice Hall, cop. 2010