26901 - Chemistry

Información del Plan Docente

Academic Year	2018/19
Subject	26901 - Chemistry
Faculty / School	100 - Facultad de Ciencias
Degree	447 - Degree in Physics
ECTS	6.0
Year	1
Semester	First semester
Subject Type	Basic Education
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)

The student should demonstrate that has achieved the expected learning results by means of the assessment activities:

1. Practical sessions (20% of the global score)

Preparation of the laboratory sessions before coming into the lab, performance of the experimental work at the laboratory and interpretation of the results will be evaluated as follows

- Written exam before going into the lab (50% of the practical sessions score). This exam will include practical questions and numerical problems about the practical sessions.

- Work in the laboratory and report of each practical session (50% of the practical sessions score).

26901 - Chemistry

A minimum average mark of 5 out of 10 is needed to pass the Laboratory activity.

If the required minimum mark is not reached, a practical exam should be taken. This exam will be proposed during the official exam period established by the Faculty.

The exam will consist in performing a practical work similar to the ones done in the laboratory during the practical sessions.

2. Written exams during the class period and global examination (80% of the global score)

Mid-term exams

- Two written exams will be hold. The first one in November, that will include units from 1 to 6, and a second one in January , that will include units from 7 to 12. The second exam will be held on the dates established by the Faculty for continuous assessment.

- Exams will consist of four questions, between theoretical questions and numerical problems. All questions will be equally scored.

For each exam, a minimum score of 5 out of 10 is needed to pass. Final score will be the average of the two written exams.

Global exam

For students that did not pass the mid-term exams will be a global exam during the official calls in February and September. Exam dates will be stablished by the Faculty prior to the beginning of the academic year.

The written exam will consist of four theoretical questions and two numerical problems. All questions will be equally scored.

Students that only failed one of the mid-term exams might choose to take the exam only for the part they failed. The written will consist of four questions, between theoretical questions and numerical problems. All questions will be equally scored. This will only apply for the February call.

Students that wish to increase their mark can take the global exam of the February call. The highest mark will be considered.

To pass the subject it will be necessary to obtain a minimum score of 5 in both the global exam and laboratory activity.

The final mark will be calculated as

Final mark= 0.8 x global mark + 0.2 x practical sessions

In case of not reaching the minimum score of 5 in any of the two parts (global mark or practical sessions), the subject will be considered 'failed' and final mark will be equal to the failed part.

Passing the course by a single global examination

To pass the evaluation activities should be desirable for students to regularly attend the planned activities along the course. Nevertheless, because varied profile of students, it might be impossible for some of them to attend class with the desired regularity due professional reasons. In this case, it will be possible to obtain the highest score taken a written exam that will assess all the theoretical and practical topics covered along the course and described in the program. Corresponding exams will be held during the official calls established by the Faculty in February and September.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It favors the understanding of the different chemical processes that occur in the environment. A wide range of teaching and learning tasks are implemented, such as theory sessions, laboratory sessions, assignments, and tutorials.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture presentations used in class, the course syllabus, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

4.2.Learning tasks

The 6 ECTS course is organized according to:

- M1. Lectures: 3.5 ECTs (35 hours). Master classes based on an expository presentation format to provide students the basic principles of Chemistry. The lecture contents as well as complementary material will be available in the Moodle Course.
- M2. Problem solving classes and seminars: 1.5 ECTs (15 hours). Classes to practice on problem solving and case analysis skills. The student will be provided with a set of problems and questions along with some of the answers. Representative examples will be discussed at the classroom working on the strategies to solve the problems and leaving the rest for the personal student work.
- M3. Laboratory sessions: 1.0 ECTs. (10 hours). The students will be organized in pairs to acquire teamwork skills. Before the start of the laboratory sessions, the student will have a manual with all the information required for the practical work. The content of the practical sessions are related to the issues discussed in the lectures. Each student must present an individual report of the results of each practical session giving answers to the questions proposed in the laboratory.
- M4. Tutorials: The resolution of questions or more detailed explanation of concepts will take place in the teacher's office at the specified schedule. It is highly recommended the assistance to tutorials for a better progress of the course
- Assignments: 90 hours.

26901 - Chemistry

Theory sessions: lecture notes and a series of problems will be available for the students. At the end of each topic, some of the solved in class by the professor and the rest will be done individually.

Laboratory sessions: In these 3-hour sessions students are provided with the practical exercises' instructions to be done as we introduction to the session's contents.

4.3.Syllabus

The course will address the following topics:

Theory sessions

- Topic 1. Atoms, compounds and chemical equations
- Topic 2. Electronic structure of the atom and periodic properties
- Topic 3. Chemical Bond I: Basic aspects
- Topic 4. Chemical Bond II: Bond theories
- Topic 5. Intermolecular forces
- Topic 6. Kinetics of chemical reactions
- Topic 7. Principles of chemical equilibrium
- Topic 8. Acid-base equilibrium
- Topic 9. Solubility equilibria and complex formation
- Topic 10. Electrochemistry and redox equilibrium
- Topic 11. Physical and chemical properties of metals and non metals
- Topic 12. Introduction to Organic Chemistry

Laboratory sessions

- **Session 1.** Concentration of solutions. Strong and weak electrolytes
- **Session 2**. Calculation of an equilibrium constant
- **Session 3.** Redox reaction. Calculation of reduction potentials

4.4.Course planning and calendar

Time distribution according to the ECTs of the different programmed activities are the following:

- Four hours per week of class: 3 h of master class and 1 h of problem solving.
- A series of three 3-hour laboratory sessions in selected weeks from November to January depending on the laboratories availability

For further details concerning the timetable, classroom and further information regarding this course please refer to the "Facultad de Ciencias" website http://ciencias.unizar.es/web/

4.5.Bibliography and recommended resources