Teaching guide

IDENTIFICATION DETAILS

Degree:	Pharmacy
Scope	Pharmacy
Faculty/School:	Experimental Sciences
Course:	INORGANIC CHEMISTRY
Type:	Basic Training
ECTS credits:	6
Year:	1
Code:	2514
Teaching period:	Second semester
Subject:	Chemistry
Module:	Chemistry
Teaching type:	Classroom-based
Language:	Spanish
Total number of student study hours:	150

SUBJECT DESCRIPTION

The general objective of the course of Inorganic Chemistry is to introduce students to the study of chemical elements based on the Periodic Table. It is intended that the student acquires the appropriate knowledge that allows them to know and relate the structure, properties, reactivity, methods of obtaining and applications of elements and their compounds.
It is also intended to acquire skills, both manual and intellectual, in the synthesis of inorganic compounds and their subsequent separation and purification. The student must become familiar with the handling and use of common material and assembly within an Inorganic Chemistry laboratory, as well as relate the structure and type of bond to the reactivity of inorganic compounds.

This subject is taught in the second semester of the first year of the Degree in Pharmacy and is part of the

Chemistry Module with an estimated 150 hours of student dedication. The purpose of this course is to provide students with the necessary knowledge to develop their profession as pharmacist in any related field: research, development, manufacturing, distribution and dispensing of medicines, as well as health information and promotion.

GOAL

Consolidate basic chemical concepts, deepening our knowledge of the electronic structure of the atom, its properties and the reactivity of the elements through: - The systematic study of chemical elements and their main types of compounds. - The relationship of the physical and chemical properties of inorganic substances with the type of bond they present. - The beginning of the study of non-molecular solids and coordination compounds. - The recognition of the importance of Inorganic Chemistry in Science and its impact on industrial and technological society. - The synthesis of different inorganic compounds that require basic and specific experimental procedures, acquiring experimental work habits and knowledge appropriate to work standards and safety in the laboratory.

PRIOR KNOWLEDGE

The study of the subject of Inorganic Chemistry requires basic knowledge of general chemistry (Baccalaureate or Course 0 in Chemistry): nomenclature and chemical formulation. Periodic system. Adjusting reactions. Atomic structure. Periodic properties. Chemical bond. Basic laboratory operations.

COURSE SYLLABUS

The course is structured in four main blocks. The first of these constitutes a review of the elementary chemical-physical concepts necessary for understanding the general reactivity of chemical elements. In addition, an introduction to Coordination Chemistry will be carried out. The second block deals with the descriptive chemistry of elements and materials, focusing on the study of their physico-chemical properties, as well as the properties of a selection of relevant compounds derived from those elements. The third block will address direct applications of Inorganic Chemistry, which will be of interest to the student. The fourth block corresponds to laboratory practices, where different inorganic compounds will be synthesized. Qualitative tests will be carried out to help understand the reactivity of the different elements and chemical compounds studied.

THEORETICAL CONTENT: General Concepts of Chemistry. Reactivity and chemical balance. States of matter. Cohesive forces. Colloidal systems. Surface tension. Atomic structure. Molecular Structure. Covalent bond, TEV, OOMM, TRPECV. Coordination Chemistry. Crystalline Materials. Amorphous Materials. Polymeric Materials. Chemistry of hydrogen, oxygen, nitrogen, phosphorus, sulfur and chlorine. Industrial Chemistry. Atmospheric Chemistry. Pollution phenomena. Energy chemistry.

PRACTICES: Throughout the practical sessions, the following items will be covered [1] Basic operations in the inorganic chemistry laboratory [2] Synthesis and isolation processes of inorganic compounds [3] Methods of chemical characterization of inorganic compounds [4] Methods of quantifying relevant inorganic compounds

EDUCATION ACTIVITIES

[AFP] ACTIVITIES RELATED TO FACE-TO-FACE WORK:

Theoretical classes (AFP1): expository sessions where the key contents of the subject will be announced.
Laboratory Practices (AFP2): work sessions in the internship laboratory.
Practical seminars (AFP3 and AFP4): practical sessions to establish and expand the concepts established in the theoretical classes.
Scheduled tutorials (AFP5): sessions to resolve doubts and correct the content of the practical seminars.
Theory Exam (AFP6): theory and practice exams

[AFNP] ACTIVITIES RELATED TO SELF-EMPLOYMENT:

Individual work (AFNP1): preparation of theory classes (you will have the content of each topic in advance) and completion of the proposed problems.
Conducting weekly online self-assessment questionnaires (AFNP1).
Preparation and delivery of the practice report (AFNP2).
Preparation of individual or group work (AFNP3)
Tutoring preparation (AFNP4)

DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
65 Horas	85 Horas

Cross Skills

To nurture an attitude of intellectual curiosity and a quest for truth in all areas of life.

To be able to approach a subject by means of rigorous, profound and comprehensive thought.

To be able to assess knowledge acquired.

To be able to apply the theoretical knowledge learnt in the of solving problems and practical cases linked to the various subjects.

LEARNING RESULTS

Identify, design, obtain, analyze and produce active ingredients, drugs and other products and materials of health interest.

Estimate the risks associated with the use of chemicals and laboratory processes.

Know and apply the main techniques of structural research, including spectroscopy.

Know the physico-chemical characteristics of the substances used for the manufacture of medicines.

Know and understand the characteristics of reactions in solution, the different states of matter and the principles of thermodynamics and their application to pharmaceutical sciences.

Know and understand the main characteristics of the elements and their compounds, as well as their application in the pharmaceutical field.

Know and understand the nature and behavior of functional groups in organic molecules.

Carry out standard laboratory processes including the use of scientific synthesis and analysis equipment, including appropriate instrumentation.

SPECIFIC LEARNING RESULTS

Apply the theoretical content in the thematic blocks (R1)

Know the chemical elements and their compounds, with special attention to the chemical aspects that are important in pharmaceutical practice (R2)

Develop the function of chemical elements and their inorganic compounds in biological systems, both in normal and altered states (R3)

Understand the atomic structure and the radioactive processes linked to the nucleus. (R4)

Deduct the electronic structure, position in the periodic system and the relationship between the electronic configurations of the elements and their properties (R5)

Assess the role of different chemical elements in biological systems in relation to their electronic configuration. (R6)

Relate different bond models to the chemical properties of atoms and molecules. (R7)

LEARNING APPRAISAL SYSTEM

The course will be considered passed when an overall final grade greater than 5.0 is reached. This will be the

average of:
[1] WRITTEN EXAM (63% SE1). A written exam will be taken to evaluate the learning of the contents presented in theoretical classes and face-to-face seminars. It will be necessary to achieve a score higher than 5.0 out of 10 in written tests so that it can average with the rest of the points to be evaluated. The grade obtained may be kept until the extraordinary call. For the recovery in Extraordinary Call, a written exam will be carried out that includes the concepts explained in the theoretical classes as well as those developed in seminars and tutoring. To be able to average with the rest of the points to be evaluated, the score must be equal to or greater than 5.0.
[2] LABORATORY PRACTICES (5% SE3 + 15% SE8). The evaluation of student performance in the practice laboratory will be done taking into account the following elements: Pre-lab questionnaires. Laboratory report. Skills and behavior in the laboratory. Theoretical exam. The delivery of pre-lab questionnaires will be mandatory. The final grade of the practical sessions will be a weighted average of these sections, provided that the theoretical exam of the practices is approved. Practices will be considered approved when the overall average rating is higher than 5.0. In the case of suspending the theoretical exam corresponding to the practical sessions, the student must appear for recovery in the extraordinary call. Attendance at all practical sessions (regardless of where they take place) is mandatory. The unjustified absence of any of these sessions leads to the loss of the right to an internship evaluation in the ordinary call and a suspension of the course. Students in this situation should immediately contact the teacher.
[3] DELIVERS SELF-EVALUATION QUESTIONNAIRES (5% SE2 + 2% SE4). Periodically, self-evaluation questionnaires will be delivered and must be completed. It will be necessary to have an average grade higher than 5.0 to pass the course.
[4] FACE-TO-FACE SEMINARS AND EXERCISE DELIVERY (10% SE3) (SE3) A series of classroom work will be proposed throughout the semester. Each of them will have an associated rating. It will be necessary to have an average of more than 5.0 in the deliveries to pass the subject.

ALTERNATIVE EVALUATION SYSTEM FOR STUDENTS IN SECOND ENROLLMENT The alternative evaluation system is intended ONLY for students in second enrollment who, due to their academic circumstances, cannot attend classes regularly. Students in second or subsequent enrollment must contact the teacher to request to take advantage of this system. In this case, the evaluation will have the following percentages: Written Test. (63%, SE1). Delivery of self-evaluation questionnaires (5% SE2 + 2% SE4). Laboratory internships (20%, SE3 and SE8) Delivery of papers and seminars (10% SE3). The evaluation of the practices will be carried out through a theoretical exam that will be adapted to the time availability of the students involved. The content of the self-evaluation seminars will be the same as that of the students in the first call. The delivery date will be adapted to the needs of students in second enrollment.

IMPORTANT 1) Students who enroll for the second or more times in a subject should contact the teacher to find out about the evaluation criteria specific to their case 2) Attendance to all practical sessions is mandatory. The unjustified absence of any of these sessions leads to the loss of the right to an internship evaluation in the ordinary call and a suspension of the course. In the same way, arriving late or leaving the practice session early leads to the loss of the right to continuous evaluation. It will be mandatory to have attended at least 3 practices to recover these in an extraordinary call. 3) Plagiarism, the use of illegitimate means in evaluation tests, and inappropriate behavior within the laboratory will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:
a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.

b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.
c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(https://www.ufv.es/gestion-de-la-informacion_biblioteca/).
d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.
2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the Guide for the Responsible Use of Artificial Intelligence in Studies at UFV. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.
3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Chang, Raymond. Chemistry/Twelfth edition.

Raymond Chang, Jason Overby. Chemistry [Electronic Resource]/13th ed. Mexico City: McGraw Hill, 2020.

Ralph H. Petrucci... [et al.]. General Chemistry [Electronic Resource]/11th ed. [S. l.] :Pearson, 2017.

E. Gutierrez Rios. Inorganic chemistry/2nd ed., digital reprint. Barcelona: Reverté, 2020.

F. Albert Cotton, Geoffrey Wilkinson. Basic Inorganic Chemistry/México D.F.: Limusa, 1991.