



1. General information

Course: FOUNDATIONS OF CHEMISTRY
Type: BASIC
Degree: 409 - CHEMISTRY
Center: 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY
Year: 1
Main language: Spanish
Use of additional languages:
Web site:

Code: 57300
ECTS credits: 12
Academic year: 2022-23
Group(s): 20 23
Duration: AN
Second language:
English Friendly: Y
Bilingual: N

Lecturer: BEATRIZ CABANAS GALAN - Group(s): 23				
Building/Office	Department	Phone number	Email	Office hours
Edificio Marie Curie (primer piso)	QUÍMICA FÍSICA	926052042	beatriz.cabanas@uclm.es	Monday 12 to 14h, Friday 10 to 12 h and Tuesday 16 to 18h
Lecturer: MARÍA VICTORIA GÓMEZ ALMAGRO - Group(s): 20				
Building/Office	Department	Phone number	Email	Office hours
IRICA	QUÍMICA INORG., ORG., Y BIOQ.	926052633	MariaVictoria.Gomez@uclm.es	Tuesday and Thursday, from 16:30 to 19:30
Lecturer: M^º ISABEL LOPEZ SOLERA - Group(s): 20				
Building/Office	Department	Phone number	Email	Office hours
Edificio San Alberto Magno (primer piso)	QUÍMICA INORG., ORG., Y BIOQ.	926052501	imabel.lopez@uclm.es	Monday, Wednesday and Friday from 12h to 14h.
Lecturer: JUANA RODRIGUEZ FLORES - Group(s): 23				
Building/Office	Department	Phone number	Email	Office hours
S. Alberto Magno	Q. ANALÍTICA Y TGIA. ALIMENTOS	926052428	juana.rflores@uclm.es	Tuesday and Thursday, from 16:30 to 19:30

2. Pre-Requisites

There are no prerequisites for this subject, although it is recommended that the student have completed Chemistry in High School. Also, it is advisable that the student is familiar with the nomenclature and formulation of inorganic

3. Justification in the curriculum, relation to other subjects and to the profession

The subject of Chemistry Foundations intends that the student deepen the understanding of the chemical concepts that he has acquired during the Baccalaureate, complete them and acquire the bases to acquire the necessary General Chemistry is an annual basic subject, which will be taught in the first year and constitutes an essential starting point for the correct learning of other more specific subjects in the different areas of Chemistry.

4. Degree competences achieved in this course

Course competences	
Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
E01	Understand and use chemical terminology, nomenclature, conventions and units
E02	Deduce the variation of the properties of the chemical elements according to the Periodic Table
E03	Handle chemicals safely and with respect to the environment
E07	Relate macroscopic properties with those of atoms, molecules and non-molecular chemical compounds
E15	Know how to handle the standard chemical instrumentation and be able to elaborate and manage standardized procedures of work in the laboratory and chemical industry
G01	Know the principles and theories of Chemistry, as well as the methodologies and applications characteristic of analytical chemistry, physical chemistry, inorganic chemistry and organic chemistry, understanding the physical and mathematical bases that require
G02	Be able to gather and interpret data, information and relevant results, obtain conclusions and issue reasoned reports on scientific, technological or other problems that require the use of chemical tools
T03	Proper oral and written communication
T05	Organization and planning capacity

5. Objectives or Learning Outcomes

Course learning outcomes	
Description	
Encourage and promote in the student all those values and attitudes inherent to scientific activity.	
Know the basic concepts and principles of Chemistry, so that the essential foundations are established so that they can successfully face the study of the different branches of the discipline.	
Homogenize the knowledge of Chemistry already acquired by students in Secondary School courses and complete certain aspects that have not been previously studied with the necessary depth.	
Achieve that the student acquires the basic terminology of Chemistry and knows how to use it, as well as being able to establish relationships between the different concepts.	
Know and correctly handle the different units.	
Learn to work autonomously in a laboratory and know how to interpret the experimental results obtained.	

6. Units / Contents

Unit 1: Origins of the quantum theory of the atom.
Unit 2: Mechanical quantum model of the hydrogen atom.
Unit 3: Polyelectronic atoms and periodic properties.
Unit 4: Ionic bond
Unit 5: Covalent bond
Unit 6: Intermolecular forces. Aggregation states.
Unit 7: Gaseous state.
Unit 8: Chemical thermodynamics.
Unit 9: Seminary: Inorganic chemical formulation.
Unit 10: Seminary: Organic chemical formulation.
Unit 11: Solutions
Unit 12: Chemical equilibrium
Unit 13: Acid-base balance.
Unit 14: Precipitation balance.
Unit 15: Complexes balance.
Unit 16: Redox balance.

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E01 E02 E03 E07 G01 G02	2.44	61	N	-	Teaching presence teaching theoretical classes and solving examples
Problem solving and/or case studies [ON-SITE]	Guided or supervised work	CB01 CB03 E01 E02 E03 E07 E15 G01 G02 T03 T05	2	50	Y	N	Problem Seminars and Case Studies
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB03 E01 E02 E03 E07 G01 G02	6.76	169	N	-	Study and exam preparation. Documentation, preparation, learning and resolution of practical cases
Progress test [ON-SITE]	Assessment tests	CB01 CB03 E01 E02 E03 E07 E15 G01 G02 T03 T05	0.16	4	Y	N	In this activity, the student must demonstrate that they are acquiring, progressively, the basic concepts
Group tutoring sessions [ON-SITE]	Group tutoring sessions	CB01 CB03 E01 E02 E07 G01 G02 T03	0.32	8	N	-	Resolution of doubts
Final test [ON-SITE]	Assessment tests	CB01 CB03 E01 E02 E07 G01 G02 T03	0.32	8	Y	N	This test may be distributed throughout the course in partial tests, according to the schedule that will be published on "Campus virtual".
Total:			12	300			
Total credits of in-class work: 5.24						Total class time hours: 131	
Total credits of out of class work: 6.76						Total hours of out of class work: 169	

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Test	20.00%	0.00%	Test of organic and inorganic formulation must be passed.
Assessment of problem solving and/or case studies	20.00%	0.00%	The resolution of problems by the student will be positively assessed at the proposal of the teacher.

Final test	60.00%	100.00%	This test may be distributed throughout the course in partial tests, according to the schedule that will be published on "Campus virtual"
Total:	100.00%	100.00%	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The student will pass the course with a minimum grade of 5 and must pass the organic and inorganic formulation test.

To average with the rest of the evaluation activities, a grade higher than 4 must be obtained. The student will only have to take the exam for the parts not passed.

Non-continuous evaluation:

There will be an exam in which the theoretical and practical concepts of the subject will be fully evaluated and must pass the organic and inorganic formulation test. The final grade will correspond to the final exam grade.

The student will pass the course with a minimum grade of 5.

Specifications for the resit/retake exam:

The same criteria above will be used. The student will only have to take the exam for the parts not passed.

Specifications for the second resit / retake exam:

There will be an exam in which the theoretical and practical knowledge will be fully evaluated and must pass the organic and inorganic formulation test. The final grade will correspond to the final exam grade.

The student will pass the course with a minimum grade of 5.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Progress test [PRESENCIAL][Assessment tests]	4
Final test [PRESENCIAL][Assessment tests]	8
Unit 1 (de 16): Origins of the quantum theory of the atom.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Unit 2 (de 16): Mechanical quantum model of the hydrogen atom.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	6
Unit 3 (de 16): Polyelectronic atoms and periodic properties.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	9
Unit 4 (de 16): Ionic bond	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	9.5
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 5 (de 16): Covalent bond	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	15.5
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 6 (de 16): Intermolecular forces. Aggregation states.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	6
Unit 7 (de 16): Gaseous state.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10.5
Unit 8 (de 16): Chemical thermodynamics.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	11
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 9 (de 16): Seminary: Inorganic chemical formulation.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	13
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 10 (de 16): Seminary: Organic chemical formulation.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	13.5
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 11 (de 16): Solutions	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10.5
Unit 12 (de 16): Chemical equilibrium	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	13.5
Unit 13 (de 16): Acid-base balance.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	13.5
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 14 (de 16): Precipitation balance.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10.5
Unit 15 (de 16): Complexes balance.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10.5
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Unit 16 (de 16): Redox balance.	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	12
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1
Global activity	

Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	61
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	50
Study and Exam Preparation [AUTÓNOMA][Self-study]	169
Progress test [PRESENCIAL][Assessment tests]	4
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	8
Final test [PRESENCIAL][Assessment tests]	8
Total horas: 300	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
F. Vinagre y L. Vázquez de Miguel	Problemas y Fundamentos de Química	Alianza			1996	
J.C. Avila, A. Fernández y col.	Equilibrios químicos en disolución: Aplicaciones analíticas	Universidad de Granada			2005	
Jiménez Tebar	Formulación y nomenclatura de Química Inorgánica	Tebar-Flores			1993	
Jones-Atkins	Principios de Química	Panamericana			2006	
Lopez Cancio	Problemas de Química. Cuestiones y ejercicios.	Prentice Hall,			2001	
M. Rodríguez Morales	Formulación y nomenclatura de Química Orgánica	Oxford Education			2004	
M.D. Reboira	Química. La ciencia básica	Thompson			2006	
M.R. Fernández y J. A. Fidalgo	1000 problemas de Química General.	Everest			2006	
Manuel Rodríguez Morales	Formulación y Nomenclatur de Química Orgánica	Oxford Education			2004	
Petrucchi-Harwood-Hearing	Química General	Prentice Hall,			2002	
Quiñoa-Riguera	Nomenclatura y Formulación de los compuestos inorgánicos.	McGraw-Hill			1996	
Quiñoa-Riguera	Nomenclatura y Formulación de los compuestos orgánicos.	McGraw-Hill			1996	
R. Chang	Química General	McGraw-Hill			2001	
Tebar-Flores	Formulación y nomenclatura de Química Orgánica	Tebar-Flores			1993	
W. R. Peterson	Introducción a la nomenclatura de las sustancias químicas	Reverté			2010	
W.H. Freeman	Química. Un proyecto de la ACS	Reverté			2004	
Whitten-Davis-Peck	Química General	McGraw-Hill			1998	
B. Green	Fundamentals of Chemistry	Chandni Chow			2007	
P. Atkins	Chemistry: A very short introduction	OUP Oxford			2014	
D.R. Francesschetty	Principles of chemistry	Salemm Press, Grey House			2016	
D:E Goldberg 4th Ed.	Fundamentals of Chemistry	Maccraw Hill			2003	
L. Jones -P. Atkins	Chemistry : molecules, matter and change 4th Ed.	Freeman and Company			2000	