



## 1. General information

Course: FOUNDATIONS OF CHEMISTRY

Type: BASIC

Degree: 398 - UNDERGRADUATE DEGREE PROGRAMME IN 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: 2020-21

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	Tuesday and Thursday from 4:30 p.m. to 6:30 p.m.

Lecturer: JUAN FERNANDEZ BAEZA - Group(s): 20

Building/Office	Department	Phone number	Email	Office hours
Edificio San Alberto Magno	QUÍMICA INORG., ORG., Y BIOQ.	3472	juan.fbaeza@uclm.es	Tuesday and Wednesday from 5 to 7 pm

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	Monday and Tuesday from 5 to 7 p.m.

Lecturer: JUAN TEJEDA SOJO - Group(s): 20

Building/Office	Department	Phone number	Email	Office hours
S. Alberto Magno	QUÍMICA INORG., ORG., Y BIOQ.	926042526	juan.tejeda@uclm.es	Monday and Tuesday from 4:30 p.m. to 6:30 p.m.

## 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

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

## 5. Objectives or Learning Outcomes

Course learning outcomes
Description
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.
Know and correctly handle the different units.
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.
Encourage and promote in the student all those values and attitudes inherent to scientific activity.

## 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 Kinetics
Unit 13: Chemical equilibrium
Unit 14: Acid-base balance.
Unit 15: Precipitation balance.
Unit 16: Complexes balance.
Unit 17: 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	Y	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 E07 G01 G02	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	7.12	178	N	N	Documentation, preparation, learning and resolution of practical cases
Final test [ON-SITE]	Assessment tests	CB01 CB03 E01 E02 E03 E07 G01 G02	0.24	6	Y	N	Preparation of evaluations
Progress test [ON-SITE]	Assessment tests	CB01 CB03 E01 E02 E07 G01 G02	0.2	5	Y	N	In this activity, the student must demonstrate that they are acquiring, progressively, the basic concepts of Chemistry
Total:			12	300			
Total credits of in-class work: 4.88			Total class time hours: 122				
Total credits of out of class work: 7.12			Total hours of out of class work: 178				

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
Self Evaluation and Co-evaluation	5.00%	0.00%	They are tests where the student will be able to evaluate the degree in which they acquire the skills developed
Progress Tests	15.00%	0.00%	In these tests the student must demonstrate that the corresponding knowledge and skills have been acquired. As you are able to progress, the student will be able to compensate them in the final test
Assessment of problem solving and/or case studies	15.00%	0.00%	The resolution of problems by the student will be positively assessed at the proposal of the teacher.
Assessment of active participation	5.00%	0.00%	Attendance and active participation in classes will be positively valued
Final test	60.00%	100.00%	Whenever the grade of 5 points is exceeded in each of the two parts into which the subject is divided. To pass each part of the subject, it will be necessary to pass the corresponding formulation tests, both in

			Inorganic Chemistry and Organic Chemistry. The approval of each of these parts will remain throughout the academic year.
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

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:**

All proposed evaluable activities will be taken into account. The final grade will be obtained considering the percentage of each of these activities

**Non-continuous evaluation:**

There will be an exam in which the theoretical and practical concepts of the subject will be fully evaluated. The final grade will correspond to the exam grade.

**Specifications for the resit/retake exam:**

There will be an exam in which the theoretical and practical knowledge will be fully evaluated.

**Specifications for the second resit / retake exam:**

There will be an exam in which the theoretical and practical knowledge will be fully evaluated.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
<b>Hours</b>	<b>hours</b>
Study and Exam Preparation [AUTÓNOMA][Self-study]	175
Final test [PRESENCIAL][Assessment tests]	6
Progress test [PRESENCIAL][Assessment tests]	5
Unit 1 (de 17): Origins of the quantum theory of the atom.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Unit 2 (de 17): Mechanical quantum model of the hydrogen atom.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Unit 3 (de 17): Polyelectronic atoms and periodic properties.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 4 (de 17): Ionic bond	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Unit 5 (de 17): Covalent bond	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 6 (de 17): Intermolecular forces. Aggregation states.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 7 (de 17): Gaseous state.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Unit 8 (de 17): Chemical thermodynamics.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 9 (de 17): Seminary: Inorganic chemical formulation.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Unit 10 (de 17): Seminary: Organic chemical formulation.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	5
Unit 11 (de 17): Solutions	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 12 (de 17): Chemical Kinetics	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 13 (de 17): Chemical equilibrium	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	4
Unit 14 (de 17): Acid-base balance.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	5
Unit 15 (de 17): Precipitation balance.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Unit 16 (de 17): Complexes balance.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	2
Unit 17 (de 17): Redox balance.	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	3
Global activity	
<b>Activities</b>	<b>hours</b>
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]	175
Final test [PRESENCIAL][Assessment tests]	6
Progress test [PRESENCIAL][Assessment tests]	5
<b>Total horas: 297</b>	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	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. Franceschetti	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