



## 1. General information

Course: CHEMISTRY

Type: BASIC

Degree: 402 - UNDERGRADUATE DEGREE PROGRAMME IN BIOTECHNOLOGY

Center: 601 - E.T.S. AGRICULTURAL ENGINEERS AND MOUNTS AB

Year: 1

Main language: Spanish

Use of additional  
languages:

Web site:

Code: 60600

ECTS credits: 6

Academic year: 2021-22

Group(s): 10

Duration: First semester

Second language:

English Friendly: Y

Bilingual: N

Lecturer: GONZALO LUIS ALONSO DIAZ-MARTA - Group(s): 10

Building/Office	Department	Phone number	Email	Office hours
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Lecturer: ROSARIO SÁNCHEZ GÓMEZ - Group(s): 10

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## 2. Pre-Requisites

Not established

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

Not established

## 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.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
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.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CE02	Understand the molecular physicochemical principles and their applications in Biotechnology.
CE03	Understand the fundamental principles of thermodynamics and chemical kinetics in the study of the behavior of matter in its various forms and deduce the fundamental laws that govern chemical equilibrium and chemical kinetics.
CG02	Capacity for analysis and synthesis.
CG03	Ability to work in multidisciplinary teams collaboratively and with shared responsibility.
CG04	Sensitivity towards environmental issues.
CT01	Know a second foreign language.
CT02	Know and apply the Information and Communication Technologies.
CT03	Use correct oral and written communication.
CT04	Know the ethical commitment and professional deontology.

## 5. Objectives or Learning Outcomes

## Course learning outcomes

Description

Apply the concepts of stereochemistry and chirality to simple biomolecules.

Formulate any inorganic or organic compound of biological relevance and identify its functional groups and its behavior when it is pure and in aqueous solutions.

Know how to calculate and use equilibrium constants with ease from thermodynamic data and predict how operating conditions will affect equilibrium.

Know how to predict the behavior of a proton transfer reaction and know how to calculate the pH of aqueous solutions of inorganic and organic compounds relevant in biology.

Know how to predict the basic chemical properties and reactivity of inorganic and organic compounds relevant in biology from the atomic and molecular structure and the nature of the bonds.

Know how to prepare solutions adjusted in volume, concentration and with determined pH.

Know how to make stoichiometric adjustments of chemical reactions and handle basic chemistry tools with ease, such as the concept of mole and molecular weight.

Know how to adjust an electronic transfer reaction and predict its behavior.

## 6. Units / Contents

Unit 1:  
Unit 2:  
Unit 3:  
Unit 4:  
Unit 5:  
Unit 6:  
Unit 7:  
Unit 8:  
Unit 9:  
Unit 10:  
Unit 11:  
Unit 12:  
Unit 13:  
Unit 14:  
Unit 15:

## 7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Project or Topic Presentations [ON-SITE]	Lectures	CB01 CB03 CB05 CE02 CE03 CG02 CG04 CT02 CT03 CT04	1.1	27.5	Y	N	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CB01 CB02 CB04 CB05 CE02 CE03 CG02 CG03 CT01 CT02 CT03	0.48	12	Y	N	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	CB01 CB02 CB05 CE02 CE03 CG02 CG03 CG04 CT01 CT02	0.52	13	Y	Y	
Practicum and practical activities report writing or preparation [OFF-SITE]	Problem solving and exercises	CB01 CB02 CB05 CE02 CE03 CG02 CT02 CT03 CT04	0.1	2.5	Y	N	
Study and Exam Preparation [OFF-SITE]	Problem solving and exercises	CB01 CB02 CB05 CE02 CE03 CG02 CT02 CT03 CT04	3.5	87.5	N	-	
Group tutoring sessions [ON-SITE]	Group Work	CB01 CB02 CB04 CE02 CE03 CG02 CT03 CT04	0.2	5	N	-	
Progress test [ON-SITE]	Assessment tests	CB01 CB02 CB05 CE02 CE03 CG02 CG03 CG04 CT03 CT04	0.1	2.5	Y	N	
<b>Total:</b>			<b>6</b>	<b>150</b>			
<b>Total credits of in-class work: 2.4</b>			<b>Total class time hours: 60</b>				
<b>Total credits of out of class work: 3.6</b>			<b>Total hours of out of class work: 90</b>				

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
Practicum and practical activities reports assessment	10.00%	10.00%	
Progress Tests	90.00%	90.00%	
<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).

## 9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	hours
<b>Unit 1 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	1
<b>Unit 2 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1.5

Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	8
<b>Unit 3 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	2.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	8
Group tutoring sessions [PRESENCIAL][Group Work]	1
<b>Unit 4 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	4
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	8
<b>Unit 5 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	5
<b>Unit 6 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	1
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	3
Progress test [PRESENCIAL][Assessment tests]	.5
<b>Unit 7 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	4
<b>Unit 8 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	3
<b>Unit 9 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	3
Progress test [PRESENCIAL][Assessment tests]	.5
<b>Unit 10 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	10
Group tutoring sessions [PRESENCIAL][Group Work]	1
<b>Unit 11 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	10
Group tutoring sessions [PRESENCIAL][Group Work]	2
<b>Unit 12 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.5
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	9.5
Group tutoring sessions [PRESENCIAL][Group Work]	1
<b>Unit 13 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>

Project or Topic Presentations [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	5
Progress test [PRESENCIAL][Assessment tests]	1
<b>Unit 14 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	5
<b>Unit 15 (de 15):</b>	
<b>Activities</b>	<b>Hours</b>
Project or Topic Presentations [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	5
Progress test [PRESENCIAL][Assessment tests]	.5
<b>Global activity</b>	
<b>Activities</b>	<b>hours</b>
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	13
Study and Exam Preparation [AUTÓNOMA][Problem solving and exercises]	87.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12
Project or Topic Presentations [PRESENCIAL][Lectures]	27.5
Group tutoring sessions [PRESENCIAL][Group Work]	5
Progress test [PRESENCIAL][Assessment tests]	2.5
<b>Total horas: 147.5</b>	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
R.H. Petrucci; F.G. Herring; J.D. Madura; C. Bissonnette	Química General. Principios y aplicaciones modernas (11ª edición)	Pearson Educación	Madrid		2017	Página Web para repasar formulación y nomenclatura en Química
K.W. Whitten; R.E. Davis; M.L. Peck; G.G. Stanley	Química (10ª edición)	Cengage Editores	Santa Fe (México)		2015	
R. Chang; K. A. Goldsby	Química (12ª edición)	Mc Graw Hill	México		2016	
Carlos Alonso	Formulación y Nomenclatura de Química Inorgánica y Orgánica <a href="http://www.alonsoformula.com/">http://www.alonsoformula.com/</a>				2019	
L.G. Wade	Química Orgánica-Volumen 2	Pearson	México		2012	
Germán Rodríguez	Química Orgánica	Omega	Barcelona		2016	
FERNÁNDEZ, M. R. y FIDALGO, J.A.	1000 problemas de Química General	Everest	León		2007	
Herrero Villen; Atienza Boronat; Noguera Murray; Tortajada Genaro; Morais Ezquerro	Problemas y cuestiones de Química General	U.P.V.	Valencia		2015	