

**1. General information****Course:** BONDING AND STRUCTURE**Type:** BASIC**Degree:** 341 - UNDERGRADUATE DEGREE PROGRAMME IN BIOCHEMISTRY**Center:** 501 - FACULTY OF ENVIRONMENTAL SCIENCES AND BIOCHEMISTRY**Year:** 1**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 13304**ECTS credits:** 6**Academic year:** 2021-22**Group(s):** 40**Duration:** First semester**Second language:** English**English Friendly:** Y**Bilingual:** N

Lecturer: <b>CAROLINA HERNANDEZ LABRADO</b> - Group(s): <b>40</b>				
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**2. Pre-Requisites**

Not established

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

The main goal of this subject is the students to learn the concepts and basic principles that determine the atomic properties and the bonding models that justify the structure of the matter. Everything learned in this subject will be applied later throughout the curriculum, mainly in those subjects that require a proper management of bonding and structural properties of chemical compounds, such as "Organic Chemistry", "Bioinorganic Chemistry", "Structure and function of macromolecules", "Structural determination", "Biomaterials", etc.

**4. Degree competences achieved in this course****Course competences**

Code	Description
E01	Express themselves correctly in basic biological, physical, chemical, mathematical and computer terms.
E02	Work properly and quality driven in a chemical, biological and biochemical laboratory, including safety, handling and disposal of waste and keeping a record of activities.
E03	Understand and know how to explain the physical and chemical bases of biochemical processes and the techniques used to investigate them
E19	Understand the principles that determine the three-dimensional structure of biological molecules, macromolecules and supramolecular complexes and be able to explain the relationships between structure and function.
G05	Develop those strategies and learning skills necessary to undertake further studies in the area of Biochemistry and Molecular Biology and other related areas with a high degree of autonomy.
T01	Proficiency in a second foreign language, preferably English, at level B1 of the Common European Framework of Reference for Languages
T03	A correct oral and written communication
T05	Organizational and planning skills
T06	Capacity for design, analysis and synthesis
T08	Ability to work as a team and, where appropriate, exercise leadership functions, encouraging entrepreneurship
T10	Ability to self-learn and to obtain and manage bibliographic information, including Internet resources

**5. Objectives or Learning Outcomes****Course learning outcomes****Description**

Understand the relationship between the structure of organic compounds and their physical properties, reactivity and stability.

The student will know and understand the origin, distribution and properties of the elements and chemical compounds, as well as the types of bonds they present and their importance in the three-dimensional structure of biomolecules and their interactions.

Be able to name organic and inorganic compounds according to IUPAC standards and represent their structure from the systematic name.

Recognize the three-dimensional structure of organic compounds and its implications.

Acquire the necessary experimental skills for the correct handling of laboratory material and chemical reagents in accordance with safety and waste disposal regulations.

## 6. Units / Contents

**Unit 1: Atomic Structure and Periodicity.**  
**Unit 2: Covalent Bonding and molecular geometry.**  
**Unit 3: Intermolecular forces. States of matter.**  
**Unit 4: Metallic bonding.**  
**Unit 5: Ionic bonding.**  
**Unit 6: Introduction to coordination chemistry.**  
**Unit 7: Laboratory**

## 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]	Combination of methods	E03 E19 T01	1.08	27	N	-	
Problem solving and/or case studies [ON-SITE]	Combination of methods	E01 E03 E19 G05 T01 T03 T05 T06 T10	0.6	15	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	E01 E02 E03 E19 G05 T01 T03 T05 T06 T08 T10	0.56	14	Y	Y	
Practicum and practical activities report writing or preparation [OFF-SITE]		E01 E02 E03 E19 G05 T01 T03 T05 T06 T08 T10	0.4	10	Y	Y	
Other on-site activities [ON-SITE]	Assessment tests	E01 E02 E03 E19 G05 T03 T05 T06 T08 T10	0.04	1	Y	Y	
Other off-site activity [OFF-SITE]		E01 E03 E19 G05 T01 T03 T05 T06 T10	0.96	24	Y	N	
Study and Exam Preparation [OFF-SITE]		E01 E02 E03 E19 G05 T10	2.24	56	N	-	
Final test [ON-SITE]		E01 E03 E19	0.12	3	Y	Y	
<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
Final test	70.00%	80.00%	Final test. To pass the course it will be essential to obtain a minimum score of 4 points out of 10 in this test. The final test is mandatory and recoverable.
Other methods of assessment	10.00%	0.00%	Activities on-line.
Test	15.00%	15.00%	To pass the course it will be essential to obtain a minimum score of 4 points out of 10 in this test. This is mandatory and recoverable.
Practicum and practical activities reports assessment	5.00%	5.00%	Assistance to the laboratory is mandatory and non recoverable.
<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:

The global score of the course will be calculated using the percentages shown in the table and to pass one must reach a minimum of 5 points. It is also mandatory to obtain a minimum score of 4 points in the final test and a minimum score of 4 points in the laboratory test.

#### Non-continuous evaluation:

The global score of the course will be calculated using the percentages shown in the table and to pass one must reach a minimum of 5 points. It is also mandatory to obtain a minimum score of 4 points in the final test and a minimum score of 4 points in the laboratory test.

### Specifications for the resit/retake exam:

The global score of the course will be calculated using the percentages shown in the table and to pass one must reach a minimum of 5 points.

It is also mandatory to obtain a minimum score of 4 points in the final test and a minimum score of 4 points in the laboratory test.

Students who having attended all laboratory sessions have not get 5 points must accomplish a written test on that part of the subject.

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

The mark obtained in the exam will constitute 100% of the grade of the subject. In order to pass, it is essential to obtain a minimum score of 5 points.

## 9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	hours

## 10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
	Chemistry, atoms first <a href="https://openstax.org/details/books/chemistry-atoms-first-2e">https://openstax.org/details/books/chemistry-atoms-first-2e</a>			1-947172-63-8	2021	Libro digital bajo licencia Creative Commons
Chang, Raymond.	Química  <a href="https://www.mheducation.es/quimica-9786071513939-spain">https://www.mheducation.es/quimica-9786071513939-spain</a>	McGraw-Hill,		978-607-15-1393-9	2017	Este libro es accesible online a través de la página de la biblioteca (Ingebook)
Atkins, P. W.	Principios de química : los caminos Médica del descubrimiento <a href="https://www.medicapanamericana.com/mx/libro/principios-de-quimica">https://www.medicapanamericana.com/mx/libro/principios-de-quimica</a>	Panamericana,		978-950-06-0282-2	2018	
Petrucchi, Ralph H.	Química general : principios y aplicaciones modernas  <a href="https://pearson.es/peru/Inicio/quimica-general-petrucchi-11ed-ebook">https://pearson.es/peru/Inicio/quimica-general-petrucchi-11ed-ebook</a>	Pearson		978-84-9035-533-6	2017	Este libro es accesible online a través de la página de la biblioteca (Ingebook)