

**1. General information****Course:** ORGANIC COMPOUNDS AND CHARACTERIZATION**Code:** 58311**Type:** CORE COURSE**ECTS credits:** 9**Degree:** 383 - UNDERGRADUATE DEGREE PROGRAMME IN FOOD SCIENCE AND TECHNOLOGY**Academic year:** 2022-23**Center:** 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY**Group(s):** 22**Year:** 2**Duration:** AN**Main language:** Spanish**Second language:** English**Use of additional languages:****English Friendly:** Y**Web site:****Bilingual:** N**Lecturer:** ANDRES MORENO MORENO - Group(s): 22

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2. Pre-Requisites

Not established

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

Over 95% of known chemical compounds are organic, that most of the compounds essential to life and the three main types of food - carbohydrates, fats and proteins - are organic. The medicines that cure us, the clothes we wear, as well as the main sources of energy - wood, coal, natural gas and oil - are all organic compounds. The application of plastic materials to the manufacture of everyday objects is another example of how difficult it is to imagine an aspect of our daily lives that is not influenced by Organic Chemistry.

That is why the study of organic compounds and their characterization methods is fundamental not only for the training of a good professional in Food Science and Technology, but also for understanding life itself.

Foods and practically everything that surrounds them (additives, colorants, flavors, etc.) are organic compounds, so this course is basic to understand and properly study various subjects of the Degree in Food Science and Technology.

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

Code	Description
E01	To acquire basic knowledge in chemistry, mathematics, physics to allow the study of the nature of foods, causes of their alteration and fundamentals of their production processes
E03	To know and be able to apply fundamentals of chemistry, as well its applications in analytical chemistry, organic chemistry, physical chemistry and inorganic chemistry in the field of the Food Science and Technology
E05	To know the composition, phyco-chemical properties, nutritional value and sensory properties of foods
G01	To develop the aptitude to gather and interpret information and data to issue critical judgments that include a reflection on relevant topics of social, scientific or ethical nature.
G02	To possess a correct oral and written communication. To transmit information, ideas, problems and solutions to a both specialized and not specialized public.
G04	To develop the necessary skills of learning to undertake later studies with a high degree of autonomy.
G07	To possess ability of organization and planning, initiative, entrepreneurship and aptitude to be employed in teamworks. To possess capacity of resolution of specific problems of the professional area and to develop the critical reasoning and decision making.

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

To develop in the student the capacity of synthesis, being critical and objective.

To develop in the student the ability to work in a team.

To know the main preparation methods and the reactivity of the main organic functional groups and relate it to their structure.

Ability to use scientific language correctly

To train the student to develop food composition analysis

To acquire skills for practical laboratory work. Acquiring the ability to experimentally develop analytical processes that include planning of sampling, treatment, and analysis.

To acquire an awareness of environmental protection by developing the idea that Organic Chemistry should be used to improve the quality of life.

To know some of the main reactions of organic compounds, applied to food chemistry.

To know the basis of the techniques for the structural determination of organic and biological compounds in foods.

To know the stereochemistry of organic compounds and the stereoselectivity of the main organic reactions

To know the structure of the main organic functional groups.

To qualify the student in order to be sensitive by the ethical exercise of the profession, taking into account the social responsibility of his reports and his repercussion in the decisions making.

To provoke and to promote in the student all those values and attitudes inherent to the scientific activity.

6. Units / Contents

Unit 1: Classification and nomenclature of organic compounds

Unit 2: Structure and bonding of organic compounds.

Unit 3: Perspective of organic reactions.

Unit 4: Alkanes and cycloalkanes. Alkanes and cycloalkanes formations

Unit 5: Stereochemistry

Unit 6: Alkenes and alkynes. Conjugation.

Unit 7: Arenes and aromaticity. Arene reactions. Electrophilic aromatic substitution.

Unit 8: Determination of molecular structures by spectroscopic methods

Unit 9: Alkyl halides. Reactions of alkyl halides. Aryl halides. Organometallic compounds.

Unit 10: Alcohols and phenols.

Unit 11: Ethers and epoxides.

Unit 12: Amines and nitrogenous derivatives.

Unit 13: Aldehydes and ketones. Nucleophilic addition to the carbonyl group.

Unit 14: Carboxylic acids.

Unit 15: Carboxylic acid derivatives. Nucleophilic substitution in acyl.

Unit 16: Enols and enolates. Ester enolates and acid derivatives.

Unit 17: Compounds of interest in food chemistry Terpenes and carotenoids; Alkaloids; Carbohydrates; Flavonoids and anthocyanins; Oils, fats and waxes; Steroids; Amino acids and peptides.

Unit 18: Structural determination, identification and quantification of organic compounds in foods.

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		1.8	45	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises		1.2	30	Y	N	
Group tutoring sessions [ON-SITE]	Group Work		0.2	5	Y	N	
Mid-term test [ON-SITE]	Assessment tests		0.12	3	Y	N	
Final test [ON-SITE]	Assessment tests		0.08	2	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study		5.6	140	N	-	
Total:			9	225			
Total credits of in-class work: 3.4			Total class time hours: 85				
Total credits of out of class work: 5.6			Total hours of out of class work: 140				

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
Assessment of problem solving and/or case studies	15.00%	0.00%	
Assessment of active participation	15.00%	0.00%	
Final test	30.00%	100.00%	
Mid-term tests	40.00%	0.00%	
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:

4 eliminatory partial examinations will be carried out. In order to eliminate material you must have a score of 5 on each of them. Only those whose score is at least 4 points will be eligible for compensation.

In addition, the resolution of exercises and practical cases will be valued, as well as the participation in class.

Non-continuous evaluation:

The total grade will be the one obtained in the final exam.

Specifications for the resit/retake exam:

Only one final exam will be taken for the whole course, and the grade will be the one corresponding to this exam

Specifications for the second resit / retake exam:

The same as in the extraordinary call.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	hours
General comments about the planning: see weekly planning	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Bruice, Paula Yurkanis	Química orgánica	Pearson Educación		978-970-26-0791-5	2008	
Carey, Francis A.	Química orgánica	McGraw Hill		970-10-5610-8	2006	
David Klein	Química Orgánica	Medica Panamericana	Madrid	978-84-9835-169-9	2014	
	www.medicapanamericana.com/quimicaorganica/klein/					
McMurry, John	Química orgánica	Thomson		970-686-354-0	2004	
Meislich, Herbert	Química orgánica	McGraw-Hill		84-7615-785-1	1995	
Primo Yúfera, E.	Química de los alimentos	Síntesis		84-7738-451-7	1998	
Primo Yúfera, E.	Química orgánica básica y aplicada : de la molécula a la ind	Universidad Politécnica Reverte		84-291-7955-0	1995	
Riguera, R. y Quiñoa, E	Ejercicios de Química Orgánica. Una guía de estudio y autoevaluación	McGraw-Hill			1994	
Solomons, T. W. Graham	Química orgánica	Limusa Wiley		968-18-5217-6	2004	
Vollhardt, K. Peter C.	Química orgánica : estructura y función	Omega		978-84-282-1431-5	2007	
Wade, L. G. , Jr.	Química orgánica	Pearson/Prentice Hall		84-205-4102-8	2004	