



Teaching Guide				
Identifying Data			2019/20	
Subject (*)	Intermediate Organic Chemistry		Code	610G01028
Study programme	Grao en Química			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Third	Obligatory	6
Language	SpanishEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	Química			
Coordinador	Rodriguez Gonzalez, Jaime	E-mail	jaime.rodriguez@udc.es	
Lecturers	Maestro Saavedra, Miguel Anxo	E-mail	miguel.maestro@udc.es	
	Rodriguez Gonzalez, Jaime		jaime.rodriguez@udc.es	
	Sarandeses Da Costa, Luis Alberto		luis.sarandeses@udc.es	
Web				
General description	Intermediate Organic Chemistry is a subject of Organic Chemistry module, which focuses on the study of nomenclature, structure, properties, reactivity and methods of synthesis of derivatives of carboxylic acids, enols and enolates, difunctional organic compounds, with nitrogenated multiple bonds, and heterocyclic rings and also compounds with biological significance, such as carbohydrates, amino acids, peptides and nucleic acids			

Study programme competences	
Code	Study programme competences
A1	Ability to use chemistry terminology, nomenclature, conventions and units
A4	Knowledge of main types of chemical reaction and characteristics of each
A6	Knowledge of chemical elements and their compounds, synthesis, structure, properties and reactivity
A9	Knowledge of structural characteristics of chemical and stereochemical compounds, and basic methods of structural analysis and research
A10	Knowledge of chemical kinetics, catalysis and reaction mechanisms
A14	Ability to demonstrate knowledge and understanding of concepts, principles and theories in chemistry
A15	Ability to recognise and analyse new problems and develop solution strategies
A21	Understanding of qualitative and quantitative aspects of chemical problems
B2	Effective problem solving
B3	Application of logical, critical, creative thinking
B4	Working independently on own initiative
C1	Ability to express oneself accurately in the official languages of Galicia (oral and in written)

Learning outcomes			
Learning outcomes		Study programme competences	
Knowledge of nomenclature, structure, properties, reactivity and the main methods for the synthesis of: carbonyl compounds, difunctional compounds, compounds containing multiple bond with nitrogen, heterocyclic compounds and those with biological relevance as carbohydrates, amino acids, peptides and nucleic acids.		A1	B2
		A4	B3
		A6	
		A9	
		A10	
		A14	
Resolution and exposure problems associated with the structure, reactivity and the synthesis of difunctional organic compounds with nitrogen multiple bonds, or heterocyclic important biological nature such as carbohydrates, amino acids, peptides and nucleic acids.		A15	B2
		A21	B3
			B4
			C1



Contents	
Topic	Sub-topic
Theme 1. Carboxylic acid derivatives	Clasification and general reactivity: addition-elimination. Esters. Amides. Acid halides and anhydrides. Nitriles.
Theme 2. Alpha Reactivity of Carbonyl Compounds	Enols and enolates: tautomerism, acidity, regioselectivity of enolate formation. Reactivity: halogenation, alkylation, aldol condensation, the Mannich reaction, the Stork reaction, the Claisen reaction, the Dieckmann reaction, the Reformatsky reaction.
Theme 3. Bifunctional Compounds	Dienes: Diels-Alder reaction. Diols and hydroxycarbonyl compounds. Dicarbonyl compounds. Alpha, beta-unsaturated carbonyl compounds.
Theme 4. Nitrogen Compounds	Nitrocompounds. Diazonium salts. Sandmeyer reaction.
Theme 5. Heterocyclic Compounds	Reactions of heterocycles. Ring-closing reactions. Aromatic heterocycles with five- and six-members: pyrrol, furane, thiophene and pyridine. Benzoderivatives: indole, quinoline and isoquinoline.
Theme 6. Carbohydrates and Nucleic Acids	Carbohydrates, classification: monosaccharides, oligosaccharides and polysaccharides. Nucleosides and nucleotides. Polynucleotides and nucleic acids.
Theme 7. Amino Acids, Peptides and Proteins	Amino Acids: structure, properties, reactivity and synthesis. Peptides: structure and synthesis. Proteins: structure and classification.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Introductory activities	A1	1	0	1
Guest lecture / keynote speech	A1 A4 A6 A9 A10 B3 B4	30	56	86
Seminar	A1 A4 A6 A9 A10 A14 A15 A21 B2 B3 B4 C1	12	38	50
Mixed objective/subjective test	A1 A4 A6 A9 A10 A14 A15 A21 B2 B3 B4 C1	6	6	12
Personalized attention		1	0	1

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Introductory activities	In the initial session teachers will be presented and the course will be described. The most important in relation to the content, planning, methodologies, assessment methods and literature aspects are discussed.
Guest lecture / keynote speech	30 theoretical sessions are scheduled in one group, in which the teacher will develop the fundamental contents of the program through theoretical explanations, type resolution problems and practical examples. The scripts of the content and / or develop presentations will be available on the website of the matter (moodle) prior to the development of lessons. With the help of these materials and other resources (bibliographic, internet ...) students will prepare lessons prior to your delivery way. Student participation will be encouraged through the development of questions or e-mails directed to the teacher before, during or after the lesson.
Seminar	It will be conducted in 12 interactive small group sessions in which students will actively participate in the analysis and resolution of the problems posed by the teacher. Questionnaires solving exercises will be available on the website of the matter (moodle) prior to the development of the classes. Students will work on the analysis and resolution of problems prior to the delivery of seminar sessions.

Mixed objective/subjective test	An intermediate test is scheduled to be developed in the middle of the course, which will allow to evaluate the consolidation of the knowledge exposed in this period. In addition, a final written exam is scheduled, which will allow to objectively evaluate the degree of assimilation and the ability to apply the contents of the subject by the student. The tests will include a single type of questions, which will be related to the structure, reactivity and synthesis of organic compounds, and will allow to determine if the answers are correct.
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Personalized attention	
Methodologies	Description
Seminar	The students will have personalized attention in the schedule of tutorials for clarification of the key concepts of the subject exposed in large groups, the resolution of individual issues raised in the workshops and keynote sessions. In addition, students can receive personalized information on any aspect of the matter during the hours of tutorials. Students with recognition of dedication and part-time and academic exemption of assistance, the professor may fully or partly exempt to attending the continuous evaluation process. Students in this circumstance must pass a specific test that leaves no doubt about achieving the powers of matter on two occasions.

Assessment			
Methodologies	Competencies	Description	Qualification
Guest lecture / keynote speech	A1 A4 A6 A9 A10 B3 B4	Attendance and active participation of the students by asking questions or by e-mail before or after the exhibition sessions were evaluated.	5
Mixed objective/subjective test	A1 A4 A6 A9 A10 A14 A15 A21 B2 B3 B4 C1	At the end of the first subjects a partial examination will be done. Students who pass this test may not repeat it on the first opportunity exam. In the examination of the second opportunity, the partial examination will not be taken into account. Final written examination, where students must solve in limited time without support materials similar to those raised during seminar sessions and oral presentation problems.	70
Seminar	A1 A4 A6 A9 A10 A14 A15 A21 B2 B3 B4 C1	Attendance and active participation of students in the analysis and resolution of the problems posed by the teacher and asking questions during interactive sessions or before and after the development of the same by e-mail will be assessed.	25

Assessment comments
Assessment by mixed test (first or second chance) will contribute to 70% of the final mark. In this respect, the mark obtained in the second opportunity (July) will replace the one obtained in the first opportunity (January). Attendance control and continuous assessment (of the work done in the lectures, seminars and through the evaluation of the written solutions to the problem bulletins) will contribute to 30% of the final mark. The mark obtained in the continuous assessment during the course may be retained at the second opportunity (July). To pass the subject it is necessary to obtain a mark greater than or equal to 5 and a minimum performance of 40% in each one of the activities. Students whose average performance exceeds 4.9 points and who do not meet the minimum performance in any of the activities will receive a score of 4.5. Only students who have participated in activities that add less than 25% of grade wool will be classified as "not presented". According to the recommendation of the Quality Commission of the Faculty of Sciences, Honors will be awarded to students who reach the highest marks at the earliest opportunity. The students evaluated in the second opportunity will only be able to choose the Honors if the maximum number of these for the corresponding course was not covered in its entirety at the first opportunity. The teaching-learning process, including evaluation, refers to an academic course and starts from scratch with the new course, including all activities and evaluation procedures programmed for that course. In the case of students with part-time recognition and academic exemption of attendance exemption, the Professor may totally or partially exempt from attending the continuous evaluation process. The student who is in this circumstance must pass a specific examination that leaves no doubt about the achievement of the competences proper to the subject in the two opportunities.



Sources of information

Basic	- Vollhardt, K. P. C. (2007). Química Orgánica. Barcelona. Omega
Complementary	

Recommendations

Subjects that it is recommended to have taken before

Organic Chemistry 1/610G01026

Organic Chemistry 2/610G01027

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Experimental Organic Chemistry/610G01029

Advanced Organic Chemistry/610G01030

Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.