27235 - Organic Chemistry Insights

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	452 - Degree in Chemistry
ECTS	5.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

Short presentation of the subject:

During the degree the student has completed two exams of organic chemistry. The first of these, "Organic Chemistry I" in 2nd year, has enabled him to know the characteristics and reactivity of the major functional groups of organic compounds. 3rd course "Organic chemistry II" has deepened understanding of the functional groups most important to extending the reactivity to more complex systems such as conjugated systems or pericyclic reactions, which has helped the student has already acquired an overview of tools that offers organic chemistry.

This year, that can be seen as an Organic Chemistry III is designed to delve into a series of new and advanced concepts that still have not been in the organic chemistry field, including strategies of organic (including choice of protective groups) synthesis, catalytic reactions, elucidation of mechanisms (including basics of computational approaches), as well as new trends in organic chemistry which may include the use of organocatalytic reactions, cascade processes, or multicomponent reactions, among others.

1.2.Recommendations to take this course

It is recommended to have passed the following subjects of organic chemistry I and organic chemistry II.

Knowledge to perform bibliographic searches through the main accessible tools at the Faculty (SciFinder, ACS, ScienceDirect, etc.), is highly recommended as well as to have followed one of the courses offered by the library of the Faculty of Sciences.

1.3.Context and importance of this course in the degree

The course delves into the more advanced concepts of organic chemistry. Its contents complete those acquired in the organic chemistry I and organic chemistry II exams in order to give a complete and specialized education in organic chemistry education.

It is complementary with other optional exams such as Chemistry Organometallic (27234), Homogeneous Catalysis (27232) and Industrial organic chemistry (27237

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1.4.Activities and key dates

Classes will begin on the date corresponding to the start of the second semester classes.

Class schedules, classroom and the calendar of exams will be published on the website of the Faculty of Sciences.

Everything related to the continuous assessment (choice and delivery of works)-related activities will be published through the digital platform ADD. The evidence regarding the continuous evaluation will be also published on the notice board of the Department of Organic Chemistry.

2.Learning goals

2.1.Learning goals

The student, to overcome this subject, shall demonstrate the following results...

It handles all general concepts, previously studied, on stereochemistry and reactivity of organic functions, using specific vocabulary and terminology accurately and property.

It determines relationships of isomerism between organic molecules, establishing relationships of topicidad between atoms and functional groups.

Meet new reactions of synthetic interest.

It is designed for moderately complex organic synthesis using a retrosynthetic analysis. Proposed reaction mechanism based on the proposed intermediate.

Difference different types of organic reactions in view of reagents and products. Sets the most suitable protective groups for the most important functional groups. It comprises and establishes methods to predict the selectivity in stereoselective reactions.

He understands the principle of Catalysis and its application to metal Catalysis and organocatalysis.

2.2.Importance of learning goals

The course learning outcomes are fundamental to acquire adequate specialization in organic chemistry that allows to address complex problems directly related to the design of synthetic routes of products of a certain complexity and the elucidation of reaction mechanisms. Also, they will provide the knowledge necessary for efficient catalytic systems in organic reactions and will offer the possibility of complementing the knowledge acquired in other disciplines related to organic chemistry.

3.Aims of the course and competences

3.1.Aims of the course

The subject and their expected results respond to the following statements and objectives:

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* Explore the interrelation between structure, properties and reactivity of organic compounds.

* Educate the student in synthetic strategies of interest for the design and preparation of compounds and materials organic.

* Establish methods to analyze an organic reaction mechanism.

* Manage primary and secondary sources of utility in organic chemistry.

3.2.Competences

To overcome the course, the student will be more competent to...

Acquire precise knowledge of the concepts and fundamentals of organic chemistry. Use with precision and property-specific vocabulary and terminology.

Express themselves orally and in writing in a clear and precise way. Connect the organic chemistry with other areas and disciplines.

Learn about and handle concepts such as: synthetic equivalent, protecting groups, investment of polarity and in general the problem of selectivity in a reaction in organic chemistry.

olve problems and questions proposed, as well as defend the results critically.

Properly handle all kinds of bibliography (primary and secondary sources, electronic searches, etc.).

Generate possible ideas and options for action before the organic chemistry-related problems.

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that it has achieved learning outcomes expected by the following evaluation activities:

According to the rules of evaluation of the University of Zaragoza, the student may submit to continuous assessment or the unique global test. The student will receive the highest score obtained in the case of presenting to both exams CA and GT).

CONTINUOUS EVALUATION

The evaluation of knowledge will be continuously assessing each of the parties that comprise the course.

- Monitoring and active participation in classes, resolution of practical questions and submission of abstracts of talks which could be programmed (5%)

- Realization of works and researches literature (25%)

- Test written (70%)

To be accepted for the written test the student will have had to carry out all the proposed activities and have been delivered, when so requested, before the designated date. The score this test is modulated with the activities carried out throughout the course according to the indicated percentage.

At the end of this test, which will be made as latest 3 days before the global test, will be the final grades of the subject, in accordance with the continuous assessment.

GLOBAL SINGLE TEST

Regardless of the continuous assessment, there will be a single global test for the subject in which you can get a rating from 0 to 10 points.

For this global test note only the same results shall be taken into account, and previous results from the continuous assessment shall not be considered.

The number of official calls for review to which the registration gives right (2 per registration) as well as the consumption of such calls is set to l permanence regulations for undergraduate studies and regulation of standards of assessment of learning. This latter Regulation, also the general criteria of the test design will be adjusted and rating, and according to the same system will be made public hours, date and place that the review will be held at publish ratings. Such regulations can be found at: http://wzar.unizar.es/servicios/coord/norma/evalu/evalu.html

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The learning process that has been designed for this course is based on the following:

The methodology of the subject is based on:

1. Theoretical lectures (3 ECTS)

2. Exercices (1 ECTS)

3. Bibliographic work & seminar (1 ECTS)

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4. Attendance at lectures at the Faculty of Sciences (follow-up study) all activities should be indicated through teaching digital ring

5.2.Learning tasks

Offered to students to assist in achieving the expected results includes the following activities:

* Master classes

* Troubleshooting: all the lectures will be followed by the corresponding classes of exercices.

* Practical cases

5.3.Syllabus

1. Asymmetric synthesis. Concepts and applications. Groups of guards in organic synthesis. Stereoselectivity. Asymmetric reactions of unsaturated systems C = x. adding models.

2. Normal kinetic resolutions (KR) and parallel (PKR. Dynamic kinetic resolution (DKR). Dynamic kinetic asymmetric transformation (DYKAT).

3. Study of reaction mechanisms. Computational approaches (concerted reactions and pericíclicas).

4. Organic reactions mediated by transition metals. Hydroformylation. Alilacion Nucleophilic. Cross.coupling.

5. Catalysis in organic chemistry. Asymmetric Organocatalysis.

6. Advanced organic synthesis. Introduction to analysis retrosynthetic.

7. New trends in organic chemistry. Biological organic chemistry.

All lectures will be followed by the corresponding classes of problems.

5.4.Course planning and calendar

Calendar of sessions and presentations

The face-to-face sessions (lectures and problems) will take place in the classroom and at the time indicated by the Secretariat of the Faculty of science and it will be available at the beginning of the course on the web: http://ciencias.unizar.es.

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From the first week of the course will be available to students, in teaching digital ring, a listing of works that they choose. The delivery will be by email in any of the formats PDF, PPT (X) or DOC (X) not being necessary to have it printed. The filing date shall be 15 days prior to the final test for the continuous assessment.

The date, place and time of this test will be announced in advance on the notice board of the Department of organic chemistry and teaching digital ring.

The subject (global) final test will be held at the place, date and time indicated by the Faculty of Sciences and will be available at the beginning of the course on the web: http://ciencias.unizar.es

5.5.Bibliography and recommended resources

BB	Dalko,P.I.. Enantioselective Organocatalysis Ed. Wiley-VCH. 2007
BB	Kocienski, P.J.. Protecting groups . - 3rd Ed. Thieme. 2005
BB	Parashar, R.K. Reaction mechanisms in organic synthesis. - 2nd Blacwell 2009
BB	Warren, Stuart. Organic synthesis. The disconnection approach / Stuart Warren . - [1st ed., 11th reprint.] Chichester [etc] : John Wiley and Sons, 1998
BC	Boons,G.J.; Hale, K.J. . Organic synthesis with carbohydrates Ed. Sheffield Academic Press. 2000
BC	Carey, Francis A.. Advanced organic chemistry. Part A, Structure and mechanisms / Francis A. Carey and Richard J. Sundberg . - 5th ed. New York [etc.] : Springer, cop. 2007
BC	Carey, Francis A.. Advanced organic chemistry. Part B, Reactions and synthesis / Francis A. Carey and Richard J. Sundberg . - 5th ed. New York [etc.] : Springer, cop. 2007
BC	Catalytic asymmetric synthesis / edited by Iwao Ojima . - 2nd ed. New York [etc] : Wiley-VCH, cop. 2000
BC	Grossman, R.B.. The art of writing

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	reasonable organic reaction mechanisms. Springer. 1999
BC	Gruttadauria,M.;Giacalone, F.. Catalytic methods in asymmetric synthesis. John Wiley & sons. 2011
BC	Harmata, M.. Organic mechanisms. Ed. Springer. 2007
BC	Hassner,A.; C. Stummer, C.. Organic syntheses based on name reactions and unnamed reactions Ed. Pergamon. 1994
BC	Jackson, R.A.. Mechanisms in Organic Reactions. Ed. RSC. 2004
BC	Merino, P.. Chemical Synthesis of nucleoside analogues. Ed. John Wiley & sons. 2013
BC	Smith, M.B.. Organic Synthesis. Ed. MacGraw Hill.
BC	Starkey, L.S.. Introduction to the strategies for Organic Synthesis. Ed. John Wiley & sons. 2012
BC	Wuts, Peter G. M.. Greene's protective groups in organic synthesis / Peter G. M. Wuts and Theodora W. Greene . - 4th ed. New York : John Wiley and Sons, 2007

Online resources:

	Organic Chemistry Portal - [http://www.organic-chemistry.org/]
	Organic Synthesis - [http://www.orgsyn.org/]