



Universidad de Jaén

FACULTY OF EXPERIMENTAL SCIENCES

Organic synthesis design

2024-2025
Grado en Química



CREA



Acceso Mayores 40

Guías docentes UJA

Horarios de tutorías

Llamamientos PEvAU

Movilidad (Coordinador)

P.O.D.

Solicitud bilingüismo

Syllabus 2024-25 - 10313007 - Organic Synthesis Design (Diseño de síntesis orgánica)

Caption

- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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Full version (Spanish)

English

DEGREE:

Grado en Químicas

FACULTY:

FACULTY OF EXPERIMENTAL SCIENCES

ACADEMIC YEAR:

2024-25

COURSE:

Organic Synthesis Design

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Organic Synthesis Design

CODE: 10313007

ACADEMIC YEAR: 2024-25

LANGUAGE: English

LEVEL: 1

ECTS CREDITS: 6.0

YEAR: 4

SEMESTER: PC

2. LECTURER BASIC INFORMATION

NAME: ALTAREJOS CABALLERO, JOAQUÍN

DEPARTMENT: U128 - QUÍMICA INORGÁNICA Y ORGÁNICA

FIELD OF STUDY: 765 - QUÍMICA ORGÁNICA

OFFICE NO.: B3 - 444

E-MAIL: jaltare@ujaen.es

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WEBSITE: --

ORCID: <https://orcid.org/0000-0002-5532-8535>

LANGUAGE: English

LEVEL: 1

3. CONTENT DESCRIPTION

UNIT 1. Organic synthesis and retrosynthetic analysis. UNIT 2. Selectivity in organic synthesis and protecting groups. UNIT 3. Retrosynthesis of aromatic compounds. UNIT 4. Retrosynthesis of compounds with a functional group. UNIT 5. Retrosynthesis of compounds with two functional groups. UNIT 6. Principles of asymmetric synthesis. UNIT 7. Asymmetric reactions and prediction models. UNIT 8. Computer-assisted organic synthesis.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

Of the 26 hours of practical classes (A2), 20 hours correspond to academically directed activities, in which the professor and students solve in the classroom a series of exercises on retrosynthesis and synthesis of organic compounds (competences B2, B8, C13, Q4, Q5), and the rest (6 h) correspond to computer-based classes, in which the students learn to use the CHAOS program, for computer-assisted organic synthesis, as well as the "Retrosynthesis" application included in SciFinder n. In these practical classes in the computer room, students will design the synthesis of a target compound (competences B2, Q5 and Q6).

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

Ordinary examination

Within the aspect "Theoretical concepts of the subject", the learning achieved by each student throughout the course on the contents of the subject will be evaluated by means of a face-to-face written exam on the established date (60% of the final grade). Competence assessment: B2, CE13.

Within the aspect "Carrying out work, cases or exercises", the daily progress of the students will be evaluated by solving in seminar classes (and in autonomous work time) of exercises related to each of the topics (25% of the final grade). Competence assessment: B2, B8, C13, Q4, Q5.

Within the aspect "Laboratory/field practices/use of ICT tools", the written report prepared by each student on the design of the synthesis of a target compound will be evaluated, after learning to manage the CHAOS and "Retrosynthesis" programs (15% of the final grade). Competence assessment: B2, Q5 and Q6.

The evaluation of the subject will be done continuously and through the "global evaluation" procedure, and the percentages of each "aspect" of the evaluation will be applied only in case the student passes each of them independently.

Extraordinary examination

In the second or successive examination calls, the student that failed the previous exams will have the possibility of being evaluated by one of the following modalities:

(A) Failed students must take a written exam in person (60% of the final grade), whose grade will be weighted average with the different sections previously evaluated.

(B) Failed students must take a face-to-face written exam (100% of the final grade).

In this way, in the extraordinary and successive examination calls, it is guaranteed that students can pass the subject aspiring to the highest grade, as stated in the current Regulations for the Academic Regime and Student Evaluation of the University of Jaén (approved by the Council of Government No. 33, of November 21, 2013).

6. BOOKLIST ([Access the bibliography in the Library catalog](#))

MAIN BOOKLIST:

- Organic synthesis : the disconnection approach Stuart Warren and Paul Wyatt. Edition: 2nd ed. Author: Warren, Stuart G.. Publisher: John Wiley & Sons ([Library](#))
- Principles of asymmetric synthesis. Edition: -. Author: Gawley, Robert E.. Publisher: Pergamon ([Library](#))
- Name reactions: a collection of detailed reaction mechanisms . Edition: -. Author: Li, Jie Jack. Publisher: Springer ([Library](#))

ADDITIONAL BOOKLIST:

- Organic synthesis: strategy and control Paul Wyatt and Stuart Warren. Edition: -. Author: Wyatt, Paul.. Publisher: John Wiley & Sons ([Library](#))
- Workbook for organic synthesis: strategy and control Paul Wyatt, Stuart Warren. Edition: -. Author: Wyatt, Paul.. Publisher: John Wiley & Sons, ([Library](#))
- Organotransition metal chemistry: from bonding to catalysis. Edition: -. Author: John F. Hartwig. Publisher: University Science Books ([Library](#))

7. SUSTAINABLE DEVELOPMENT GOALS

Salud y bienestar

Educación de calidad

Trabajo decente y crecimiento económico

Industria, innovación e infraestructura

Producción y consumo responsables

DETAILED INFORMATION

-Within SDG-3 (Health and well-being) the aim is to contribute to goal 3.9 that is proposed: "By 2030, substantially reduce the number of deaths and diseases caused by dangerous chemicals and air, water and soil pollution."

-Within SDG-4 (Quality Education) the aim is to contribute to goal 4.4 that is proposed: "By 2030, considerably increase the number of young people and adults who have the necessary skills, particularly technical and professional, to access to employment, decent work and entrepreneurship".

-Within SDG-8 (Decent work and economic growth) the aim is to contribute to goal 8.2 that is proposed: "Achieve higher levels of economic productivity through diversification, technological modernization and innovation, among other things, focusing on the sectors with great added value and intensive use of labor.

-Within SDG-9 (Industry, innovation and infrastructure) the aim is to contribute to goal 9.5 that is proposed: "Increase scientific research and improve the technological capacity of the industrial sectors of all countries, particularly developing countries, among other things by promoting innovation and significantly increasing, by 2030, the number of people working in research and development per million inhabitants and the expenditure of the public and private sectors on research and development.

-Within SDG-12 (Responsible production and consumption) the aim is to contribute to goal 12.5 that is proposed: "By 2030, considerably reduce waste generation through prevention, reduction, recycling and reuse activities."

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

TEACHING METHODOLOGY AND TRAINING ACTIVITIES

32 classroom hours A1, online to the students, and carried out in the classroom and broadcast by videoconference. 26 classroom hours A2, face-to-face (insofar as conditions allow), and carried out in the classroom and broadcast 2 hours of face-to-face class A3, online, conducted by videoconference to the entire group. At all times, and regardless of whether the number of students exceeds the capacity allowed by the classroom or not, the degree of attendance will be established by the Faculty, based on the teaching planning of the degree as a whole.

EVALUATION SYSTEM

The same evaluation system will be maintained, with the necessary adaptations depending on the situation.

TOOLS

For actions by telematic means, the technical means provided by the University will be used, including the PLATEA platform or the set of tools included in Google Suite, as well as other types of resources such as electronic bibliographic resources that do not require the physical presence in library.

9. VIRTUAL TEACHING SCENARIO

TEACHING METHODOLOGY AND TRAINING ACTIVITIES

32 online class hours A1, 100% of the students, by videoconference. 26 classroom hours A2, and 2 classroom hours A3, 100% of the students, and by videoconference.

EVALUATION SYSTEM

The same evaluation system will be maintained, with the necessary adaptations depending on the situation.

TOOLS

For telematic actions, the technical means provided by the University will be used, including the PLATEA platform or the set of tools included in Google Suite, as well as other types of resources, such as electronic bibliographic resources that do not require physical presence in library.

DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es

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