Faculty of Experimental Sciences

GENERAL SPECIFICATIONS

ACADEMIC YEAR 2023-24

BACHELOR'S DEGREE IN CHEMISTRY

Subject Data

Name:	
Química Orgánica II	
English name:	
Organic Chemistry II	
Code:	**Type:**
757509215	Obligatory

Hours:

	Total	**In class**	**Out class**
Time distribution	150	60	90

ECTS:

Standard group	**Small groups**			
	Classroom	**Lab**	**Practices**	**Computer classroom**
2	0	4	0	0

Departments:	**Knowledge areas:**
Department of Chemistry	Organic Chemistry
Year:	**Semester**
3rd	2nd semester

ANEXO I

TEACHING STAFF		
Name:	**E-mail:**	**Telephone**
Prof. Dr. Uwe Pischel	uwe.pischel@diq.uhu.es	959219982
Other Data		
Tutoring (office hours): Office hours: Mon 14-17 h, Tue 14-17 h; professor's office in Robert H. Grubbs building		

ANEXO I

SPECIFIC INFORMATION OF THE COURSE

1. Contents description:

1.1 In English:

The course "Organic Chemistry II" is taught in the second semester of the 3rd year of the Chemistry Degree studies. The student starts this course after having enrolled in the basic courses "Introduction to the Chemical Laboratory II", "Basic Concepts of Organic Chemistry", and "Organic Chemistry". This has provided the student with the necessary basic knowledge about the work in a chemistry laboratory. In this course the student will acquire theoretical-practical knowledge about synthetic sequences and methodologies in an Organic Chemistry laboratory.

1.2 In Spanish:

La asignatura “Química Orgánica II” se imparte en el segundo cuatrimestre del tercer curso del Grado en Química. El alumno cursará esta asignatura tras las asignaturas básicas de "Introducción al Laboratorio Químico 2","Conceptos Básicos en Química Orgánica" y "Química Orgánica", por lo que posee los conocimientos básicos necesarios del trabajo en un laboratorio de química. De esta manera se tomará contacto teórico-práctico con secuencias y metodologías sintéticas intermedias dentro de un laboratorio de química orgánica.

2. Background:

2.1 Situation within the Degree:

This course allows the student to broaden and extend his/her knowledge about organic reactions and synthetic methodology. This offers an opportunity to familiarize with basic experimental techniques in organic synthesis, frequently encountered in research laboratories of companies or public institutions.

2.2 Recommendations

Having studied previously the courses "Basic Concepts of Organic Chemistry" (1st year) and "Organic Chemistry" (2nd year) and “Structure Determination of Organic Compounds” (3rd year).

3. Objectives (as result of teaching):

Study of theoretical problems in organic synthesis, complemented by synthetic techniques/methods and the characterization of organic compounds.

4. Skills to be acquired

4.1 Specific Skills:

C2: Know the main types of reactions and characteristics associated to them.

C4: Know the main techniques of structural determination, including spectroscopy.

C11: Know the properties of aliphatic, aromatic, heterocyclic and organometallic compounds.

C12: Know the nature and behaviour of functional groups in organic molecules.

C13: Know the main synthetic routes in organic chemistry, including the functional group interconversions and the formation of carbon-carbon and carbon-heteroatom bonds.

4.2 General, Basic or Transversal Skills:

CB1: That students have demonstrated possession and understanding of knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of their field of study.

CB2: That students know how to apply their knowledge to their work or vocation in a profesional way and possess the skills that are usually demonstrated through the elaboration and defence of arguments and the resolution of problems within their area of study.

CB3: That students have the ability to gather and interpret relevant data (within their area of study in general) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.

CB4: That students can transmit information, ideas, problems and solutions, to both a specialized and non-specialized audience.

CB5: That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

CG1: That students have developed and demonstrated learning skills and knowledge from their field of study, being able to apply them in their work, interpreting relevant data to make judgments on topics of various kinds, being able to transmit them to both a specialized and non-specialized audience.

5. Training Activities and Teaching Methods

5.1 Training Activities:

Theory classes and laboratory classes; individual and tutored work

5.2 Teaching Methods:
Standard group/small group Lectures consisting of the theory related to the course. Didactic resources: powerpoint presentations. Work on problems related to the theory content of the course. Laboratory experiments: experimental techniques, discussion of results and conclusions.
5.3 Development and Justification:
Classes of theory: Will be done with the complete group of students. The objective is to structure the concepts of the course. The professor's exposition is supported by audiovisual means. The theoretical classes will be accompanied by the solving of problems related to the theoretical content, in order to exercise and deepen the understanding of the taught concepts. Laboratory classes: The objective of these sessions is to apply the acquired theory knowledge in practical sessions in the laboratory.

6. Detailed Contents

Theory content:

Topic 1. Formation and reactivity of enoles and enolate ions. Enolate equivalents: enamines. Alkylation of enolates and enamines. Alkylation of 1,3-dicarbonyl compounds. Michael reaction. Alkylation of enones. (5.0 hours)

Topic 2. Intra- and intermolecular aldol condensations. Cross aldol condensations. Robinson annulation. Claisen condensation. Dieckmann condensation. Mannich reaction. (6.0 hours)

Topic 3. Advanced oxidation reactions. (5.0 hours)

Topic 4. Chemoselective and stereoselective reductions of carbonyl groups. Reductions of other functions. (4.0 hours)

Practical content:

Experiment 1. Condensation of benzaldehyde and acetone. The Claisen-Schmidt reaction.

Experiment 2. Enamines. Acetylation of cyclohexanone.

Experiment 3. Synthesis of cinnamic acid by Perkin condensation.

Experiment 4. Mannich reaction with indole.

Experiment 5. Synthesis and determination of the stereochemistry of 1,2-diphenyl-1,2-ethandiol

7. Bibliography

7.1 Basic Bibliography:

Experimental Organic Chemistry. L. M. Harwood, C. J. Moody, J. M. Percy, ed. Blackwell

Organic Chemistry. J. Clayden, N. Greeves, S. Warren, P. Wothers, ed. Oxford Univ. Press

Organic Chemistry. L. G. Wade, ed. Prentice Hall

7.2 Additional Bibliography:

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8. Systems and Assessment Criteria

8.1 System for Assessment:

The assessment system consists of the following components:

Written final exam,

Exam related to the laboratory sessions,

Laboratory performance/assistance to practical sessions,

Continuous evaluation.

8.2 Assessment Criteria and Marks:

8.2.1 Examinations Convocatory I

In this modus 40% of the course qualification is obtained by continuous evaluation.

This includes:

- attitude and practical capabilities of the student (10% of the total qualification) – mark a)

- Exam about the theoretical-practical contents of the laboratory session (30% of the total qualification) – mark b).

The other 60% of the global qualification of the course will be determined in a final exam. This exam consists of theoretical questions and theoretical/practical problems related to the content of the course. For a “pass” evaluation of the whole course a minimum mark of 5.0 (over 10) in the final exam AND a minimum mark of 5.0 (over 10) in the global evaluation (weighted sum of continuous evaluation component and final exam) is required. The final mark is calculated as follows:

Final mark = 0.1 x mark a) + 0.3 x mark b) + 0.6 x mark final exam

mark a) and b) correspond to the points mentioned above

In case the exam receives a "non-pass" evaluation, automatically the corresponding exam mark will be stated as final mark.

In the final qualification the student’s compliance with the basic norms of behavior and functioning, which should be respected by the university community of the Faculty of Experimental Sciences, will be considered. These norms were approved in the Faculty Council.

8.2.2 Examinations Convocatory II

This evaluation will be realized in one final exam that counts for 100% of the global mark. This exam consists of theoretical questions and theoretical/practical problems related to the content of the whole course, including the laboratory part. For approval of the whole course a minimum mark of 5.0 (over 10) in the final exam is required. No marks that were obtained in previous activities/evaluations will be considered. In the final qualification the student’s compliance with the basic norms of behavior and functioning, which should be respected by the university community of the Faculty of Experimental Sciences, will be considered. These norms were approved in the Faculty Council.

8.2.3 Examinations Convocatory III

This evaluation will be realized in one final exam that counts for 100% of the global mark. This exam consists of theoretical questions and theoretical/practical problems related to the content of the whole course, including the laboratory part. For approval of the whole course a minimum mark of 5.0 (over 10) in the final exam is required. No marks that were obtained in previous activities/evaluations will be considered. In the final qualification the student's compliance with the basic norms of behavior and functioning, which should be respected by the university community of the Faculty of Experimental Sciences, will be considered. These norms were approved in the Faculty Council.

8.2.4 Extraordinary Convocatory

This evaluation will be realized in one final exam that counts for 100% of the global mark. This exam consists of theoretical questions and theoretical/practical problems related to the content of the whole course, including the laboratory part. For approval of the whole course a minimum mark of 5.0 (over 10) in the final exam is required. No marks that were obtained in previous activities/evaluations will be considered. In the final qualification the student's compliance with the basic norms of behavior and functioning, which should be respected by the university community of the Faculty of Experimental Sciences, will be considered. These norms were approved in the Faculty Council.

8.3 Single Final Evaluation:

The "single final evaluation" modus is realized with one exam that counts for 100% of the final mark. This exam consists of theory questions and theory/practical problems related to the content of the course, including the laboratory part. For a "pass" evaluation a minimum mark of 5.0 (over 10) in the final exam is required.

To opt for this evaluation modus, the student is required to communicate this decision to the coordinating professor of the course. This should be done within the first two weeks of course activity, counted from the first day of classes in this course or, if the enrolment was effectuated after the start of the course, within two weeks counted from the date of enrolment. Opting for the "final evaluation" modus implies the definite renouncement of the possibility to be evaluated in the "continuous evaluation" modus. In accordance with the evaluation regulations of the University of Huelva (approved in the Government Council of the 13th of March 2019) this decision is final and the modus cannot be changed back to "continuous evaluation" during the course 2023/24.

In the final qualification the student's compliance with the basic norms of behavior and functioning, which should be respected by the university community of the Faculty of Experimental Sciences, will be considered. These norms were approved in the Faculty Council.

9. Orientative weekly teaching organization

		Small group					
Date	Standard group	Classroom	Lab	Field practices	Computer classroom	Tests/evaluation	Content
Week 1	4	0	0	0	0	0	Topic 1
Week 2	4	0	0	0	0	0	Topic 1 + 2
Week 3	4	0	0	0	0	0	Topic 2 + 3
Week 4	4	0	0	0	0	0	Topic 3
Week 5	4	0	0	0	0	0	Topic 4
Week 6	0	0	0	0	0	0	-
Week 7	0	0	0	0	0	0	-
Week 8	0	0	0	0	0	0	-
Week 9	0	0	0	0	0	0	-
Week 10	0	0	8	0	0	0	Lab experiments*
Week 11	0	0	20	0	0	0	Lab experiments*
Week 12	0	0	12	0	0	0	Lab experiments*
Week 13	0	0	0	0	0	3	Lab exam**
Week 14	0	0	0	0	0	0	-

Week 15	0	0	0	0	0	0	-
TOTAL	**20**	**0**	**40**	**0**	**0**	**3**	

* The order of the experiments (see point 6) is organized by each student group. ** See 8.2.1.