COURSE DESCRIPTION

COURSE DETAILS

Title (of the course): **QUÍMICA BIOORGÁNICA**
Code: 101866
Degree/Master: **GRADO DE BIOQUÍMICA** Year: 4
Field: QUÍMICA BIOORGÁNICA
Character: OPTATIVA Duration: FIRST TERM
ECTS Credits: 6.0 Classroom hours: 60
Face-to-face classroom percentage: 40.0% Study hours: 90
Online platform: Moodle

LECTURER INFORMATION

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PREREQUISITES AND RECOMMENDATIONS

Prerequisites established in the study plan

The student can enroll in elective subjects/courses once he/she has passed the 60 credits corresponding to basic training and, at least, 60 additional compulsory credits.

Recommendations

To have a basic understanding of Chemistry and particularly of Organic Chemistry.
To have at least a B1 level in English (this requirement is mandatory for the recognition of having taken the subject in English according to the Plurilingualism Programme of the University of Córdoba).

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INTENDED LEARNING OUTCOMES

CB1	Ability for critical and self-cricical thinking.
CB2	To know how to work in cooperation collaboratively and with shared responsibility.
CB4	To have learning and autonomous work capacity
CB5	To be able to employ principles of the scientific method.
CB7	To know how to use basic tools for communication, search for information and data processing in their professional activity.
CE1	To understand the physical and chemical bases of biología processes and the main physical, chemical and mathematical tools used to investigate them.
CE3	To understand the basic principles that determine molecular structure and chemical reactivity of simple biomolecules.
CE4	To understand the principles that determine the structure of the biological macromolecules (including proteins and nucleic acids), as well as the biological supramolecular complexes, and to be able to explain the relationships between the structure and its fuction.
CE22	To know how to work appropriately in a biochemical laboratory with biological and chemical material, including safety, handling, removal of biological and chemical wastes and inscribed record of activities.

OBJECTIVES

- To know some families of organic compounds of interest in Biochemistry.
- To understand the basic principles of Biocatalysis.
- To apply methods and techniques from Organic Chemistry to solve biological problems

CONTENT

1. Theory contents

1. Theory contents

Part I: Natural Products Chemistry

- Terpenes and steroids. Structure and classification. Compounds of biological importance.
- Heterocyclic compounds of biological interest. Alkaloids. Structure and classification. Biochemical significance.

Part II: Application of biocatalysts in chemical synthesis.

- Enzymes. Hydrolytic reactions, redox processes and formation of C-C bonds. Other reactions catalyzed by enzymes. Use of enzymes in organic solvents. Immobilization of enzymes.
- Antibodies. Catalysis with antibodies. Applications of catalytic antibodies.

Part III: Supramolecular Chemistry

- Introduction to supramolecular chemistry: molecular recognition, self-assembly and self-organization.
- Artificial enzymes. Coronands and cavitands.
- Combinatorial chemistry. Application to drug discovery.

2. Practical contents

2. Practical contents

- Bibliographic databases of interest in organic chemistry and biochemistry.
- Laboratory sessions: extraction of natural products, application of biocatalysts in organic synthesis.

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METHODOLOGY

Methodological adaptations for part-time students and students with disabilities and special educational needs

Their availability will be taken into account. Some agreements between the lecturer and the students will be needed.

Face-to-face activities

Activity	Large group	Medium group	Total
Assessment activities	3	-	3
Lab practice	-	18	18
Lectures	30	-	30
Seminar	-	3	3
Text analysis	-	3	3
Tutorials	-	3	3
Total hours:	***33***	***27***	***60***

Off-site activities

Activity	Total
Analysis	20
Exercises	10
Information search	5
Reference search	5
Self-study	50
Total hours	***90***

WORK MATERIALS FOR STUDENTS

Placement booklet

EVALUATION

Intended learnig	Essay	Exams	Laboratory Practice	Oral Presentation	Placement reports
CB1	X	X	X	X	X

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Intended learnig	Essay	Exams	Laboratory Practice	Oral Presentation	Placement reports
CB2	X				
CB4	X	X		X	
CB5	X		X		
CB7	X			X	
CE1	X	X	X	X	X
CE22	X		X		
CE3		X		X	
CE4		X		X	
Total (100%)	***20%***	***40%***	***10%***	***20%***	***10%***
Minimum grade	***4***	***4***	***4***	***4***	***4***

(*)Minimum grade necessary to pass the course

¿Valora la asistencia?:

No

General clarifications on instruments for evaluation:

Minimum score to eliminate content and period of validity for partial qualifications: Minimum grade of 5 to pass the subject. Valid for the present academic year.

Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

Their availability will be taken into account. Some agreements between the lecturer and the students will be needed.

Qualifying criteria for obtaining honors:

It can be given to students with a grade equal to or greater than 9. This mention can not exceed 5% of the students.

BIBLIOGRAPHY

1. Basic Bibliography

- H. Beyer, W. Walter, "Handbook of organic chemistry", Prentice Hall, London, 1996.
- J.-M. Lehn, "Supramolecular chemistry. Concepts and perspectives", VCH, Weinheim, 1995.
- M. C. Feiters, "Supramolecular catalysis", Comprehensive Supramolecular Chemistry, Vol. 10, Supramolecular Technology, Ed. D. N. Reinhoudt, Pergamon, Oxford, 1996.
- R. Breslow, "Biomimetic chemistry and artificial enzymes: Catalysis by design", Accounts of Chemical Research 1995, 28, 146-153.
- K. Faber, "Biotransformations in organic chemistry - A textbook", 2nd edition, Springer-Verlag, Berlin, 1995.
- C. H. Wong, G. M. Whitesides, "Enzymes in synthetic organic chemistry", Tetrahedron Organic Chemistry Series Vol. 12 (J. E. Baldwin and P. D. Magnus), Pergamon, Oxford, 1994.

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- "Handbook of enzyme biotechnology", 2nd edition (A. Wiseman, Ed.), John Wiley & Sons, Chichester, 1985.
- Revisiones de revistas científicas de prestigio.

2. Further reading

None

COORDINATION CRITERIA

Tasks deadlines

SCHEDULE

Period	Assessment activities	Lab practice	Lectures	Seminar	Text analysis	Tutorials
1# Fortnight	0,0	0,0	4,0	3,0	0,0	0,0
2# Fortnight	0,0	0,0	4,0	0,0	0,0	0,0
3# Fortnight	0,0	6,0	4,0	0,0	0,0	0,0
4# Fortnight	0,0	6,0	4,0	0,0	0,0	0,0
5# Fortnight	0,0	6,0	4,0	0,0	0,0	0,0
6# Fortnight	0,0	0,0	4,0	0,0	3,0	0,0
7# Fortnight	0,0	0,0	4,0	0,0	0,0	3,0
8# Fortnight	3,0	0,0	2,0	0,0	0,0	0,0
Total hours:	***3,0***	***18,0***	***30,0***	***3,0***	***3,0***	***3,0***

The methodological strategies and the evaluation system contemplated in this Course Description will be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required.

CONTINGENCY PLAN: CASE SCENARIO A

Case scenario A will correspond to a diminished on-site academic activity due to social distancing measures affecting the permitted capacity of classrooms.

METHODOLOGY

General clarifications on the methodology on case scenario A

A multimodal (hybrid) teaching system will be adopted, combining both on-site and remote classes via videoconference (synchronous) that will be held in the timetable approved by the corresponding Faculty or School. The time distribution of teaching activities (both on-site and remote) will be decided by the aforementioned Faculties and Schools bearing in mind the permitted capacity of classrooms and social distancing measures as established at that time.

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EVALUATION

Intended learnig	Essay	Exams	Laboratory Practice	Oral Presentation	Placement reports
CB1	X	X	X	X	X
CB2	X				
CB4	X	X		X	
CB5	X		X		
CB7	X			X	
CE1	X	X	X	X	X
CE22	X		X		
CE3		X		X	
CE4		X		X	
Total (100%)	***20%***	***40%***	***10%***	***20%***	***10%***
Minimum grade	***4***	***4***	***4***	***4***	***4***

(*)Minimum grade necessary to pass the course

Attendance will be assessed (Scenario A)?:

No

General clarifications on instruments for evaluation (Scenario A):

La aportación de cada actividad en la evaluación a la nota final será:
40% -> Conocimientos adquiridos en las clases magistrales y evaluados en un exámen final
20% -> Essay
20% -> Oral Presentation
10% -> Placement report
20% -> Laboratory Practice
Puntuación mínima para eliminar contenido: 5
En las convocatorias extraordinarias del curso 2020-2021 para estudiantes de segunda matricula o superior el alumno deberá realizar un examen (40%). Asimismo, se conservarán las calificaciones obtenidas en el curso 2019-2020 en el trabajo realizado en el laboratorio (10%), la memoria de prácticas (10%), la exposición oral (20%) y el ensayo (20%).

Clarifications on the methodology for part-time students and students with disabilities and special educational needs (Scenario A):

Their availability will be taken into account. Some agreements between the lecturer and the students will be needed.

COURSE DESCRIPTION

Qualifying criteria for obtaining honors (Scenario A):

It can be given to students with a grade equal to or greater than 9. This mention can not exceed 5% of the students.

CONTINGENCY PLAN: CASE SCENARIO B

Case scenario B will bring about a suspension of all on-site academic activities as a consequence of heath measures.

METHODOLOGY

General clarifications on the methodology on case scenario B

On-site teaching activities will be held via videoconference (synchronous) in the timetable approved by the corresponding Faculty or School. Alternative activities will be proposed for reduced groups in order to guarantee the acquisition of course competences.

EVALUATION

Intended learnig	Essay	Exams	Laboratory Practice	Oral Presentation	Placement reports
CB1	X	X	X	X	X
CB2	X				
CB4	X	X		X	
CB5	X		X		
CB7	X			X	
CE1	X	X	X	X	X
CE22	X		X		
CE3		X		X	
CE4		X		X	
Total (100%)	***20%***	***40%***	***10%***	***20%***	***10%***
Minimum grade	***4***	***4***	***4***	***4***	***4***

(*)Minimum grade necessary to pass the course

Moodle Tools	Ensayo	Exposición oral	Exámenes	Informes/memorias de prácticas	Prácticas de laboratorio
Pruebas simultáneas por videoconferencia			X		

COURSE DESCRIPTION

Moodle Tools	Ensayo	Exposición oral	Exámenes	Informes/memorias de prácticas	Prácticas de laboratorio
Tarea	X		X	X	X
Videoconferencia		X			X

Attendance will be assessed (Scenario B)?:

No

General clarifications on instruments for evaluation (Scenario B):

La aportación de cada actividad en la evaluación a la nota final será:
40% -> Conocimientos adquiridos en las clases magistrales y evaluados en un exámen final
20% -> Essay
20% -> Oral Presentation
10% -> Placement report
20% -> Laboratory Practice
Puntuación mínima para eliminar contenido: 5
En las convocatorias extraordinarias del curso 2020-2021 para estudiantes de segunda matricula o superior el alumno deberá realizar un examen (40%). Asimismo, se conservarán las calificaciones obtenidas en el curso 2019-2020 en el trabajo realizado en el laboratorio (10%), la memoria de prácticas (10%), la exposición oral (20%) y el ensayo (20%).

Clarifications on the methodology for part-time students and students with disabilities and special educational needs (Scenario B):

Their availability will be taken into account. Some agreements between the lecturer and the students will be needed.

Qualifying criteria for obtaining honors (Scenario B):

It can be given to students with a grade equal to or greater than 9. This mention can not exceed 5% of the students.