COURSE DESCRIPTION

COURSE DETAILS

Title (of the course): **BIOQUÍMICA EXPERIMENTAL II**
Code: 101856
Degree/Master: **GRADO DE BIOQUÍMICA** Year: 3
Name of the module to which it belongs: INTEGRACIÓN FISIOLÓGICA Y APLICACIONES DE LA BIOQUÍMICA Y BIOLOGÍA
Field: BIOQUÍMICA EXPERIMENTAL II
Character: OBLIGATORIA Duration: SECOND TERM
ECTS Credits: 6.0 Classroom hours: 60
Face-to-face classroom percentage: 40.0% Study hours: 90
Online platform: https://moodle.uco.es/m2021/

LECTURER INFORMATION

Name: MICHÁN DOÑA, CARMEN MARÍA (Coordinador)
Department: BIOQUÍMICA Y BIOLOGÍA MOLECULAR
Area: BIOQUÍMICA Y BIOLOGÍA MOLECULAR
Office location: Edificio Severo Ochoa, 2ª Planta
E-Mail: bb2midoc@uco.es Phone: 8082

Name: REQUEJO AGUILAR, RAQUEL
Department: BIOQUÍMICA Y BIOLOGÍA MOLECULAR
Area: BIOQUÍMICA Y BIOLOGÍA MOLECULAR
Office location: Edificio Severo Ochoa, 1ª Planta
E-Mail: bb2reagr@uco.es Phone: 8317

PREREQUISITES AND RECOMMENDATIONS

Prerequisites established in the study plan

None

Recommendations

None specified

COURSE DESCRIPTION

INTENDED LEARNING OUTCOMES

CB2	Knowing how to work collaboratively in a team and share responsibilities
CB4	Being able to learn and work independently
CB5	Knowing how to apply the principles of scientific approaches
CB7	To know how to use basic ICT tools for communication, research and data processing in a professional context.
CB8	To know how to read scientific texts in English.
CE17	To understand the main methods of testing the biological activity of cell components, especially of enzymes, both in vitro and in vivo.
CE20	To aid students' understanding of the manipulation of nucleic acids, as well as the principle techniques which facilitate the study of the functioning of genes.
CE21	To possess the quantitative skills required to work in a biochemical laboratory, including the ability to prepare chemical reactants for experiments in a precise and reproducible manner.
CE22	To understand how to work in a biochemical laboratory with biological and chemical material, including regarding safety, the handling of material, the disposal of biological and chemical waste and recording the activities carried out.
CE23	To know how to apply experimental laboratory protocols within the field of Biochemistry and Molecular Biology.
CE24	To possess skills in mathematics, statistics and ICT in order to obtain, analyze and interpret data and in order to understand simple models of biological systems and processes on the cellular and molecular level.
CE27	To understand the basic principles of experiment design in the field of Biochemistry and Molecular Biology, taking into consideration the limitations of experimental approaches.

OBJECTIVES

To know the bases and the applications for the main techniques in Biochemistry and Molecular Biology
To know how to: extract, manipulate and characterize nucleic acids; make subcellular fractioning and characterize the obtained fractions; perform microorganisms transformations and cultures.
To learn how to work safely and clean in a molecular lab with both biological and chemical substances

CONTENT

1. Theory contents

Module 1. Extraction and characterisation of nucleic acids. Techniques for those methodologies. Detection of nucleic acids.
Module 2. Basic techniques for manipulation and quantification of nucleic acids. Gene expression quantification: real-time PCR. Promotor activity determination by gene fussions. Non-traditional cloning methodologies. Mutant construction.
Module 3: Culture and transformation of cells.
Module 4: Subcellular fractioning. Charaterisation of subcellular fractions.

2. Practical contents

Lab practices:
LP1. Isolation of RNA from eukaryotic cells. Retrotranscription.

COURSE DESCRIPTION

LP2. Transcript level determination by real time PCR.
LP3. Gene deletion/ gene therapy in yeast by homolog recombination.
LP4. Mammalian transformation. Gene silencing (siRNA).
LP5. Gene therapy by CRISPR-Cas 9.
LP6. Organelle isolation from eukaryotic cells.
LP7. Characterisation of subcellular fractions by electrophoresis, metabolites analysis and enzymatic activities determination.

METHODOLOGY

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

Partial-time student needs will be analysed individually.
Methodologies and evaluation parameters will be adaptated to students with special needs

Face-to-face activities

Activity	Large group	Medium group	Total
Assessment activities	6	-	6
Lab practice	-	42	42
Lectures	9	-	9
Tutorials	-	3	3
Total hours:	***15***	***45***	***60***

Off-site activities

Activity	Total
Analysis	20
Information search	20
Reference search	20
Self-study	30
Total hours	***90***

WORK MATERIALS FOR STUDENTS

Case studies
Coursebook
Dossier
Exercises and activities

COURSE DESCRIPTION

EVALUATION

Intended learnig	Case study/clinical case discussion/scientific work discussion	Exams	Placement reports
CB2	X	X	X
CB4	X		X
CB5	X	X	X
CB7	X		X
CB8	X	X	X
CE17	X	X	X
CE20	X	X	X
CE21			X
CE22			X
CE23	X		X
CE24	X		X
CE27			X
Total (100%)	***25%***	***50%***	***25%***
Minimum grade	***4***	***4***	***4***

(*)Minimum grade necessary to pass the course

¿Valora la asistencia?:

No

General clarifications on instruments for evaluation:

There will be a continuous evaluation during the practical sessions that will cover 50% of the final calification, that will be divided in 25% for reports and 25% for case studies for each practical sessions. The remaining 50 % will be evaluated by a final exam that will cover both theoretical and practical issues.

Assistance is mandatory for all practical sessions. Assistance to theoretical sessions will be considered positevely in the continuous evaluation

Repeater students will be evaluated using the same parameters as new ones

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

Partial-time student needs will be analysed individually.

Methodologies and evaluation parameters will be adaptated to students with special needs

COURSE DESCRIPTION

Qualifying criteria for obtaining honors:

According to UCO rules

BIBLIOGRAPHY

1. Basic Bibliography

Molecular Cloning: A Laboratory Manual (4th Edition) Michael R. Green; Joseph Sambrook Cold Spring Harbor Laboratory Press 978-1-936113-42-2 (2012).
Principles and Techniques of Biochemistry and Molecular Biology. 2010. Edited by Keith Wilson & John Walker. ISBN: 978-0-521-51635-6.
Protocolos Cold Spring Harbor: http://cshprotocols.cshlp.org/

2. Further reading

Specific bibliografy will be recommended for each module

COORDINATION CRITERIA

Common learning outcomes

Clarifications

This subject content is coordinated with "MIC" and "Bioquímica Experimental I"

SCHEDULE

Period	Assessment activities	Lab practice	Lectures	Tutorials
1# Week	0,0	3,0	1,5	0,0
2# Week	0,0	3,0	0,0	0,0
3# Week	0,0	3,0	1,5	0,0
4# Week	1,0	3,0	0,0	0,0
5# Week	0,0	3,0	1,5	0,0
6# Week	1,0	3,0	0,0	0,0
7# Week	0,0	3,0	1,5	0,0
8# Week	0,0	3,0	0,0	0,0
9# Week	0,0	3,0	1,5	0,0
10# Week	1,0	3,0	0,0	0,0
11# Week	0,0	3,0	1,5	0,0
12# Week	1,0	3,0	0,0	0,0

COURSE DESCRIPTION

Period	Assessment activities	Lab practice	Lectures	Tutorials
13# Week	1,0	3,0	0,0	0,0
14# Week	1,0	3,0	0,0	3,0
Total hours:	***6,0***	***42,0***	***9,0***	***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.

The theoretical foundations will be taught in the classroom through master classes. In case the simultaneous presence of all students enrolled in the subject is not possible, the theoretical teaching will be carried out by synchronous videoconference. Students will complete these classes by consulting the recommended bibliography for each topic. The practical classes will be taught in the laboratories of the Department of Biochemistry and Molecular Biology of the UCO, in the Severo Ochoa building. The sanitary measures of interpersonal distance will be maintained, and in cases where that distance cannot be maintained, the use of a mask will be mandatory. The individual tutorials will be developed in person in the University spaces, always keeping the interpersonal distance, and in the event that attendance is not possible, through videoconference that will be agreed with the student.

COURSE DESCRIPTION

EVALUATION

Intended learnig	Case study/clinical case discussion/scientific work discussion	Exams	Placement reports
CB2	X	X	X
CB4	X		X
CB5	X	X	X
CB7	X		X
CB8	X	X	X
CE17	X	X	X
CE20	X	X	X
CE21			X
CE22			X
CE23	X		X
CE24	X		X
CE27			X
Total (100%)	***25%***	***50%***	***25%***
Minimum grade	***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):

There will be a continuous evaluation during the practical sessions that will cover 50% of the final calification, that will be divided in 25% for reports and 25% for case studies for each practical sessions. The remaining 50 % will be evaluated by a final exam that will cover both theoretical and practical issues.

Assistance is mandatory for all practical sessions. Assistance to theoretical sessions will be considered positevely in the continuous evaluation

In the case of students in second or successive matriculations, in the extraordinary October exam as in others of this course, repeaters may be evaluated in the same way as students in first matriculation, keeping the marks obtained in the laboratory (Placement reports) and classroom (Real and/or simulated tasks) practices of previous courses, which is part of the continous evaluation.

COURSE DESCRIPTION

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

Partial-time student needs will be analysed individually.

Methodologies and evaluation parameters will be adaptated to students with special needs

Qualifying criteria for obtaining honors (Scenario A):

According to UCO rules

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.

The classroom teaching activity will be carried out by videoconference (synchronous sessions) at the same corresponding times. Alternative activities will be proposed for small groups that guarantee the acquisition of the competences of the subject. The theoretical foundations will be taught by synchronous videoconference. The students will complete these classes consulting the recommended bibliography for each topic. The laboratory practices will be taught synchronously through videoconference. The students will have available a copy of all the audiovisual material used, which may also be accompanied specific material prepared by the teacher to facilitate monitoring. The individual tutorials will be developed through videoconference that will be agreed with the students.

COURSE DESCRIPTION

EVALUATION

Intended learnig	Case study/clinical case discussion/scientific work discussion	Exams	Placement reports
CB2	X	X	X
CB4	X		X
CB5	X	X	X
CB7	X		X
CB8	X	X	X
CE17	X	X	X
CE20	X	X	X
CE21			X
CE22			X
CE23	X		X
CE24	X		X
CE27			X
Total (100%)	***25%***	***50%***	***25%***
Minimum grade	***4***	***4***	***4***

(*)Minimum grade necessary to pass the course

Moodle Tools	Exámenes	Informes/memorias de prácticas	Supuesto práctico/discusión caso clínico/discusión trabajo científico
Pruebas simultáneas por videoconferencia	X		
Tarea		X	X

Attendance will be assessed (Scenario B)?:

No

General clarifications on instruments for evaluation (Scenario B):

There will be a continuous evaluation during the practical sessions that will cover 50% of the final calification, that will be divided in 25% for reports and 25% for case studies for each practical sessions. The remaining 50 % will be evaluated by a final exam that will cover both theoretical and practical issues.

Assistance is mandatory for all practical sessions. Assistance to theoretical sessions will be considered positevely

COURSE DESCRIPTION

in the continuous evaluation

In the case of students in second or successive matriculations, in the extraordinary October exam as in others of this course, repeaters may be evaluated in the same way as students in first matriculation, keeping the marks obtained in the laboratory (Placement reports) and classroom (Real and/or simulated tasks) practices of previous courses, which is part of the continous evaluation.

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

Partial-time student needs will be analysed individually.

Methodologies and evaluation parameters will be adaptated to students with special needs

Qualifying criteria for obtaining honors (Scenario B):

According to UCO rules