

COURSE DESCRIPTION

COURSE DETAILS

Title (of the course): **REACTORES BIOLÓGICOS**

Code: 102257

Degree/Master: **GRADO DE CIENCIA Y TECNOLOGÍA DE LOS ALIMENTOS** Year: 4

Name of the module to which it belongs: OPTATIVIDAD / RECONOCIMIENTO

Field: OPTATIVIDAD

Character: OPTATIVA

Duration:

ECTS Credits: 3.0

Classroom hours: 30

Face-to-face classroom percentage: 40.0%

Study hours: 45

Online platform: Moodle

LECTURER INFORMATION

Name: GARCIA GARCIA, ISIDORO (Coordinador)

Department: QUÍMICA INORGÁNICA E INGENIERÍA QUÍMICA

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PREREQUISITES AND RECOMMENDATIONS

Prerequisites established in the study plan

English B1 level certificate

Recommendations

A previous course on Industrial Fermentations is advisable

COURSE DESCRIPTION

INTENDED LEARNING OUTCOMES

CB2	To know how to apply knowledge to their work or vacation in a professional way. To have the skills that are usually demonstrated through the elaboration and defence of arguments and the resolution of problems within their area of study.
CB5	To develop the the skills necessary to undertake further studies with a high degree of autonomy.
CU2	To know and improve the user's level in the field of ICT.
CT2	Ability to resolve problems.
CT4	Ability to apply theoretical knowledge to your practice.
CT7	Ability to analyse and summarise.
CE1	To recognise and apply the basics of physics, chemistry, biology, physiology, mathematics, and statistics necessary for the comprehension and development of Science and Technology.
CE4	To recognise and apply the main basic operations of industrial processes to ensure the control of processes and food products intended for human consumption.
CE6	To know, understand and apply the classic methodology and the new technological processes aimed at improving the production and treatment of food.
CE16	To put into practice the principles and methodologies that define the professional profile of the food scientist and technologist, demonstrating in an integrated way the acquisition of the skills and competencies that are looked at throughout the degree.

OBJECTIVES

Many food industries carry out microbial biotransformation operations; the design and basic working aspects of the bioreactors involved in the process use to have a strong influence in the global results. For that reason, this course is aimed:

- To realise the importance of bioreactors in Food Industries.
- To know the most frequent type of bioreactors.
- To introduce the basic issues for the design and analysis of a bioreactor.

CONTENT

1. Theory contents

- Topic 1.- Bioreactors in Food Industries.
- Topic 2.- Type of bioreactors.
- Topic 3.- Design and modelling of bioreactors.
- Topic 4.- Kinetics.
- Topic 5.- Example of batch process
- Topic 6.- Example of semi-batch process.

2. Practical contents

- Numerical problems
- Laboratory bioreactors
- Visiting industrial plants

COURSE DESCRIPTION

METHODOLOGY

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

The specific rules laid down by the Faculty will be followed. Additionally, special circumstances must be weighted up in each case.

Face-to-face activities

Activity	Large group	Medium group	Total
<i>Examinations</i>	3	-	3
<i>Excursions</i>	3	-	3
<i>Lab practice</i>	-	4	4
<i>Lectures</i>	12	-	12
<i>Seminar</i>	-	8	8
Total hours:	18	12	30

Off-site activities

Activity	Total
<i>Exercises</i>	20
<i>Information search</i>	5
<i>Self-study</i>	20
Total hours	45

WORK MATERIALS FOR STUDENTS

Dossier
Exercises and activities
Lessons summary
References

COURSE DESCRIPTION

EVALUATION

Intended learnig	Debate	Exams	Problem solving
CB2	X	X	X
CB5		X	X
CE1	X	X	X
CE16		X	X
CE4		X	X
CE6		X	
CT2			X
CT4	X		X
CT7	X		X
CU2			X
Total (100%)	10%	40%	50%
Minimum grade	0	4	4

(*)Minimum grade necessary to pass the course

¿Valora la asistencia?:

No

General clarifications on instruments for evaluation:

- Only short answer questions will be considered in Exams.
- Additionally, problem solving tests will be carry out during the course.
- The use of any paper printed material is allowed for Exams and Problem Solving Tests

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

The specific rules laid down by the Faculty will be followed. Additionally, special circumstances must be weighted up in each case.

COURSE DESCRIPTION

Qualifying criteria for obtaining honors:

In accordance with the Article 80 paragraph 3 of the University of Cordoba Academic Regulations

BIBLIOGRAPHY

1. Basic Bibliography

- BASIC BIOTECHNOLOGY. J. Bu'lock & B. Kristiansen. Academic Press Inc. London. 1987
- INGENIERÍA BIOQUÍMICA. F. Gòdia Casablanca y J. López Santín. Editorial Síntesis. 1998
- INGENIERÍA DE BIOPROCESOS. Mario Díaz. Ediciones Paraninfo. 2012.
- BIOPROCESS ENGINEERING PRINCIPLES. P.A. Doran. Academic Press. (London), 1995

2. Further reading

None

COORDINATION CRITERIA

Visits organization

SCHEDULE

Period	Examinations	Excursions	Lab practice	Lectures	Seminar
1# Week	0,0	0,0	0,0	2,5	0,0
2# Week	0,0	0,0	0,0	2,5	0,0
3# Week	0,0	0,0	0,0	2,5	3,0
4# Week	0,0	0,0	0,0	2,5	3,0
5# Week	0,0	0,0	0,0	2,0	2,0
6# Week	0,0	0,0	2,0	0,0	0,0
7# Week	0,0	0,0	2,0	0,0	0,0
8# Week	0,0	3,0	0,0	0,0	0,0
14# Week	3,0	0,0	0,0	0,0	0,0
Total hours:	3,0	3,0	4,0	12,0	8,0

COURSE DESCRIPTION

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.

EVALUATION

Intended learning	Debate	Exams	Problem solving
CB2	X	X	X
CB5		X	X
CE1	X	X	X
CE16		X	X
CE4		X	X
CE6		X	
CT2			X
CT4	X		X
CT7	X		X
CU2			X
Total (100%)	10%	40%	50%
Minimum grade	0	4	4

(*)Minimum grade necessary to pass the course

Attendance will be assessed (Scenario A)?:

No

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General clarifications on instruments for evaluation (Scenario A):

- Only a questionnaire will be considered in "Exams". The questionnaire will preferentially be online. This activity will be held on the official examination date.
- Additionally, "Problem Solving" tests will be carry out. Theses activities will be developed continuously during the course. Online questionnaires and the proposal of specific numerical problems could be considered; a training for the "Exams" tool is looked for.
- The instruments for evaluation: "Exams" and "Problem Solving" are individual activities. If plagiarized parts are detected, the student will fail the examination having to resit it next official call.

The grade of "Not presented" will correspond to the student who has not taken part in a number of evaluable activities whose weights on the final grade amount to more than 50% (Art. 80.4 of the Regulations for the Academic Regime of Degree Studies). For the student who has participated in assessment activities other than the final exam whose accumulated weight on the final grade exceeds 50% and has not attended the final exam of the subject, the teacher will record "Not presented" in the provisional publication of the ratings. If during the review process, the student does not express their disagreement with that grade, it will be consolidated into the final mark for the course. Otherwise, they must contact the teacher and the final grade would be the weighted sum of the scores achieved in all the evaluation methods to which they have attended according to the criteria established in the teaching guide.

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

The specific rules laid down by the Faculty will be followed. Additionally, special circumstances must be weighted up in each case.

Qualifying criteria for obtaining honors (Scenario A):

According to the Article 80 paragraph 3 of the University of Cordoba Academic Regulations. In any case, a rate, at least, close to 9.5 would be necessary

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.

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EVALUATION

Intended learnig	Debate	Exams	Problem solving
CB2	X	X	X
CB5		X	X
CE1	X	X	X
CE16		X	X
CE4		X	X
CE6		X	
CT2			X
CT4	X		X
CT7	X		X
CU2			X
Total (100%)	10%	40%	50%
Minimum grade	0	4	4

(*)Minimum grade necessary to pass the course

Moodle Tools	Debate	Exámenes	Resolución de problemas
Cuestionario		X	X
Tarea			X
Videoconferencia	X		

Attendance will be assessed (Scenario B)?:

No

General clarifications on instruments for evaluation (Scenario B):

- Only a questionnaire will be considered in "Exams". The questionnaire will preferantially be online. This activity will be held on the official examination date.
- Additionally, "Problem Solving" tests will be carry out. Theses activities will be developed continuously during the course. Online questionnaires and the proposal of specific numerical problems could be considered; a training for the "Exams" tool is looked for.

COURSE DESCRIPTION

- The instruments for evaluation: "Exams" and "Problem Solving" are individual activities. If plagiarized parts are detected, the student will fail the examination having to resit it next official call.

The grade of "Not presented" will correspond to the student who has not taken part in a number of evaluable activities whose weights on the final grade amount to more than 50% (Art. 80.4 of the Regulations for the Academic Regime of Degree Studies). For the student who has participated in assessment activities other than the final exam whose accumulated weight on the final grade exceeds 50% and has not attended the final exam of the subject, the teacher will record "Not presented" in the provisional publication of the ratings. If during the review process, the student does not express their disagreement with that grade, it will be consolidated into the final mark for the course. Otherwise, they must notify/contact with teacher and the final grade would be the weighted sum of the scores achieved in all the evaluation methods to which they have attended according to the criteria established in the teaching guide.

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

The specific rules laid down by the Faculty will be followed. Additionally, special circumstances must be weighted up in each case.

Qualifying criteria for obtaining honors (Scenario B):

According to the Article 80 paragraph 3 of the University of Cordoba Academic Regulations. In any case, a rate, at least, close to 9.5 would be necessary