

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 (Coordinator)

Department: QUÍMICA INORGÁNICA E INGENIERÍA QUÍMICA

Area: 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

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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, in the context of their production processes, include microbial biotransformation operations. These operations are carried out using bioreactors; the type and mode of operation of this equipment have an important effect on the results obtained. Therefore, in a food science and technology degree, an introduction to the study of this type of equipment is considered necessary:

- To highlight the importance of this equipment.
- To know the main types of bioreactors.
- To make an introduction to the basic aspects necessary for their analysis and design.

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



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SUSTAINABLE DEVELOPMENT GOALS RELATED TO THE CONTENT

Unrelated

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. For students with special educational needs, the recommendations provided by the Diversity Attention Service of UCO will be followed.

Face-to-face activities

Activity	Large group	Medium group	Total
<i>Examinations</i>	3	-	3
<i>Lab practice</i>	-	4	4
<i>Lectures</i>	15	-	15
<i>Seminar</i>	-	8	8
<i>Total hours:</i>	18	12	30

Off-site activities

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

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WORK MATERIALS FOR STUDENTS

Dossier

Exercises and activities

Lessons summary

References

EVALUATION

Intended learning	Debate	Exams	Laboratory Practice	Resource Bank
CB2	X	X		
CB5		X		X
CE1	X	X		X
CE16		X	X	X
CE4		X	X	X
CE6		X	X	
CT2		X	X	X
CT4	X	X	X	X
CT7	X	X		X
CU2				X
Total (100%)	10%	70%	10%	10%
Minimum grade	0	4	0	0

(*)Minimum mark (out of 10) needed for the assessment tool to be weighted in the course final mark. In any case, final mark must be 5,0 or higher to pass the course.

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Attendance will be assessed?:

No

General clarifications on instruments for evaluation:

The final exam will include numerical problems and questionnaires on theory and will only be valid for the current call. The "Resource Bank", "Debate" and "Laboratory Practice" assessment instruments will be carried out throughout the course; the latter may be carried out in groups or individually; the marks for these two assessment instruments may be kept indefinitely if the student so wishes. For the tests of the instruments "Exams" and "Resource Bank", the student may freely use any paper material. These tests are of an individual nature; if copying is detected between students, the student will fail the exam.

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. For students with special educational needs, the recommendations provided by the Diversity Attention Service of UCO will be followed.

Clarifications on the evaluation of the extraordinary call and extra-ordinary call for completion studies:

The evaluation criteria for special calls will be the same than for the normal ones. The equivalent previous calls' marks will be used for the items "Resources Bank" and "Debate"; nevertheless, an examination will be carried out in the official date for the criterium "Exams".

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 Casablanco 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

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2. Further reading

None

COORDINATION CRITERIA

Tasks performance

SCHEDULE

Period	Examinations	Lab practice	Lectures	Seminar
1# Fortnight	0,0	0,0	2,0	0,0
2# Fortnight	0,0	0,0	2,0	0,0
3# Fortnight	0,0	0,0	2,0	2,0
4# Fortnight	0,0	0,0	2,0	3,0
5# Fortnight	0,0	0,0	2,0	3,0
6# Fortnight	0,0	4,0	3,0	0,0
7# Fortnight	3,0	0,0	2,0	0,0
Total hours:	3,0	4,0	15,0	8,0

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.