



## 1. General information

Course: BIOPROCESS ENGINEERING II

Type: CORE COURSE

Degree: 402 - UNDERGRADUATE DEGREE PROGRAMME IN BIOTECHNOLOGY

Center: 601 - E.T.S. AGRICULTURAL ENGINEERS AND MOUNTS AB

Year: 2

Main language: Spanish

Use of additional  
languages:

Web site:

Code: 60619

ECTS credits: 6

Academic year: 2023-24

Group(s): 10

Duration: C2

Second language:

English Friendly: Y

Bilingual: N

Lecturer: ANDRES ALVARRUIZ BERMEJO - Group(s): 10

Building/Office	Department	Phone number	Email	Office hours
Edificio Manuel Alonso Peña.	PROD. VEGETAL Y TGIA. AGRARIA	2849	andres.alvarruiz@uclm.es	

Lecturer: FRANCISCO JAVIER RAMOS MELLADO - Group(s): 10

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## 2. Pre-Requisites

Not established

## 3. Justification in the curriculum, relation to other subjects and to the profession

Not established

## 4. Degree competences achieved in this course

## Course competences

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CE10	Apply mass and energy balances to calculate systems, and obtain results from heat and mass transfer processes and separation processes.
CG01	Organizational and planning skills.
CG02	Capacity for analysis and synthesis.
CG03	Ability to work in multidisciplinary teams collaboratively and with shared responsibility.
CG04	Sensitivity towards environmental issues.
CT01	Know a second foreign language.
CT02	Know and apply the Information and Communication Technologies.
CT03	Use correct oral and written communication.
CT04	Know the ethical commitment and professional deontology.

## 5. Objectives or Learning Outcomes

## Course learning outcomes

## Description

- To know about the fundamentals of biotechnological processes at laboratory scale to understand their design at industrial scale.
- To Acquire a critical attitude and aptitude towards the technologies applicable to the processes carried out in the agri-food industries
- To Recognize the devices used for the application of the main biotechnological processes.
- To Know the calculation methods and the design systems needed for the application of the main processes in the agri-food industry.
- To know the physico-chemical rules that govern the process engineering
- To know the different operations to process agri-food products

## 6. Units / Contents

## Unit 1:

## Unit 2:

## Unit 3:

## Unit 4:

Unit 5:

Unit 6:

Unit 7:

Unit 8:

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG04 CT01 CT02 CT03 CT04	1	25	Y	N	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG02 CG03 CG04 CT01 CT02 CT03 CT04	0.7	17.5	Y	Y	
Formative Assessment [ON-SITE]	Assessment tests	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG02 CG04 CT01 CT02 CT03 CT04	0.14	3.5	Y	Y	
Problem solving and/or case studies [ON-SITE]	Assessment tests	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG02 CG03 CG04 CT01 CT02 CT03 CT04	0.36	9	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG02 CG04 CT01 CT02 CT03 CT04	2.8	70	Y	N	
Practicum and practical activities report writing or preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG02 CG03 CG04 CT01 CT02 CT03 CT04	0.8	20	Y	N	
Group tutoring sessions [ON-SITE]	Group tutoring sessions	CB01 CB02 CB03 CB04 CB05 CE10 CG01 CG02 CG03 CG04 CT01 CT02 CT03 CT04	0.2	5	Y	N	
Total:			6	150			
Total credits of in-class work: 2.4			Total class time hours: 60				
Total credits of out of class work: 3.6			Total hours of out of class work: 90				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System			
Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Test	30.00%	40.00%	
Practicum and practical activities reports assessment	30.00%	30.00%	
Assessment of active participation	10.00%	0.00%	
Assessment of problem solving and/or case studies	30.00%	30.00%	
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	25
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	17.5
Formative Assessment [PRESENCIAL][Assessment tests]	3.5
Problem solving and/or case studies [PRESENCIAL][Assessment tests]	9
Study and Exam Preparation [AUTÓNOMA][Self-study]	70
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	20
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	5
Global activity	
Activities	hours
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	5
Class Attendance (theory) [PRESENCIAL][Lectures]	25
Study and Exam Preparation [AUTÓNOMA][Self-study]	70
Formative Assessment [PRESENCIAL][Assessment tests]	3.5

Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	17.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	20
Problem solving and/or case studies [PRESENCIAL][Assessment tests]	9
<b>Total horas: 150</b>	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Ibarz, Albert	Operaciones unitarias en la ingeniería de alimentos <a href="https://elibro.net/es/ereader/bibliotecaclm/35857">https://elibro.net/es/ereader/bibliotecaclm/35857</a>	Mundi-Prensa		84-8476-163-0	2005	Bibliografía básica
Perry, R. H.	Manual del ingeniero químico	McGraw-Hill		84-481-3008-1	2001	Bibliografía complementaria
Doran, Pauline M.	Principios de Ingeniería de los Bioprocesos <a href="https://ebookcentral.proquest.com/lib/bibliotecaclm-ebooks/reader.action?docID=316993">https://ebookcentral.proquest.com/lib/bibliotecaclm-ebooks/reader.action?docID=316993</a>	Acribia	Zaragoza	84-200-0853-2	1995	Bibliografía básica
Bird, Steward, Lightfoot	Fenómenos de transporte <a href="https://elibro.net/es/ereader/bibliotecaclm/117750">https://elibro.net/es/ereader/bibliotecaclm/117750</a>	Reverte		9788429170504	1992	Bibliografía complementaria
Recasens, F.	Procesos de separación en biotecnología industrial <a href="https://elibro.net/es/ereader/bibliotecaclm/106566">https://elibro.net/es/ereader/bibliotecaclm/106566</a>	Universitat Politècnica de Catalunya		978-84-9880-696-0	2018	Bibliografía básica
Díaz Fernandez, J.M.	Ingeniería de los bioprocesos	Paraninfo		978-84-1366-023-3	2012	Bibliografía básica
Doran, P.M.	Bioprocess engineering principles	Elsevier		978-0-12-220851-5	2013	Bibliografía complementaria