UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: FOOD BIOTECHNOLOGY
Code: 58316
Type: CORE COURSE
ECTS credits: 6
Degree: 383 - UNDERGRADUATE DEGREE PROGRAMME IN FOOD SCIENCE AND TECHNOLOGY
Academic year: 2023-24
Center: 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY
Group(s): 22
Year: 3
Duration: First semester
Main language: Spanish
Second language:
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **ANA ISABEL BRIONES PEREZ** - Group(s): **22**

Building/Office	Department	Phone number	Email	Office hours
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Lecturer: **PILAR FERNANDEZ-PACHECO RODRIGUEZ** - Group(s): **22**

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Edificio Sabatini. Despacho 26	Q. ANALÍTICA Y TGIA. ALIMENTOS	5486	Pilar.FRodriguez@uclm.es	

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
E04	To know the basic fundamentals of instrumentation and process control in the food industry
E08	To be able to apply the technological advances and the innovation in foods and food processing processes in the food industry and to evaluate their acceptability by consumers
E12	To acquire knowledge on microbiology and biotechnology and their applications in the food processing
G01	To develop the aptitude to gather and interpret information and data to issue critical judgments that include a reflection on relevant topics of social, scientific or ethical nature.
G02	To possess a correct oral and written communication. To transmit information, ideas, problems and solutions to a both specialized and not specialized public.
G04	To develop the necessary skills of learning to undertake later studies with a high degree of autonomy.
G05	To understand and to use the English language, both written and spoken, applied to the area of the Food Science and Technology. (To be able to acquire this hability, a series of actions that will be specified in every module will be peformed).
G06	To dominate the Technologies of the Information and the Communication (TIC) to user's level, which allows to work in virtual spaces, Internet, electronic databases, as well as with common software packages (e.g. Microsoft Office).
G07	To possess ability of organization and planning, initiative, entrepreneurship and aptitude to be employed in teamworks. To possess capacity of resolution of specific problems of the professional area and to develop the critical reasoning and decision making.
G09	To develop the motivation for quality, the capacity to adapt to new situations and the creativity.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

To achieve that the students acquire the basic terminology of the subject.
Be aware of the importance of the term 'strain' in biotechnology and to know the molecular methods for its identification
To initiate the students in the fundamentals of the food biotechnology
To achieve that the student is capable of searching, selecting and interpreting the information in the area of the food biotechnology
To know the beneficial microorganisms for the food industry and / or involved in the processes of the elaboración/ripeness of fermented foods
To know other fermented bioproducts used by the food industry
To understand the metabolism of the species of interest, as well as the biochemical transformations that happen in the principal fermented food.
To understand the technology and the systems of the fermentation
To provoke the capacity of criticism and discussion towards new topics related to the matter

6. Units / Contents

Unit 1: Definition of Biotechnology. Role of the Biotechnology in Food Industry
Unit 2: Industrials microorganisms: definition, desirable characteristics and sources. Study of the more relevant groups

Unit 3: Selection of microorganism for industrial use. Conservation and preservation methods
Unit 4: Genetic modification of industrial microorganisms: mutation and recombinant DNA
Unit 5: Growth kinetic of cultures on batch and fed batch. Primary and secondary metabolism
Unit 6: Industrial media used in industrial process
Unit 7: Development of industrial inocula. Propagation methods. Immobilized cells
Unit 8: Microbial metabolism: alcoholic, lactis, acetic and glycerol piruvic fermentations
Unit 9: Food and beverages obtained by fermentation process
Unit 10: Bioproducts used in food industry
Unit 11: Bioreactor design

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises		0.1	2.5	Y	N	
Study and Exam Preparation [OFF-SITE]	Self-study		0.8	20	Y	N	
Class Attendance (theory) [ON-SITE]	Lectures		1.12	28	Y	N	
Portfolio Development [OFF-SITE]	Individual presentation of projects and reports		1	25	Y	N	
Final test [ON-SITE]	Assessment tests		0.14	3.5	Y	N	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities		0.8	20	Y	N	
Project or Topic Presentations [ON-SITE]	Workshops and Seminars		0.24	6	Y	N	
Writing of reports or projects [OFF-SITE]	Self-study		1.8	45	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
Assessment of problem solving and/or case studies	10.00%	10.00%	
Theoretical exam	70.00%	0.00%	
Final test	0.00%	75.00%	
Laboratory sessions	15.00%	15.00%	
Portfolio assessment	5.00%	0.00%	
Total:	**100.00%**	**100.00%**	

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**

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Bamforth, Charles W.	Alimentos, fermentación y microorganismos	Acribia		978-84-200-1088-5	2007	
Bamforth, Charles W.	Food, fermentation and micro-organisms	Blackwell Science		0-632-05987-7	2005	
Cocolin & Ercolini	Molecular techniques in the ecology of fermented foods	Springer			2000	
Demain & solomon	Manual of industrial microbiology and biotechnology	ASM Press			1999	
Lee	Fundamentos de biotecnologia de alimentos					
Leveau & Bouix	Microbiología industrial: los microorganismos de interes industrial	Acribia			2000	
	Practical fermentation and	John Wiley &				

Mcneil &Harvey	technology	Sons		2009
Okafor, Nduka	Modern industrial microbiology and biotechnology	Science Publishers	978-1-57808-434-0	2007
STANBURY, Peter F.	Principles of Fermentatio Technology	Pergamon Press	0-08-024406-8	1993