



1. General information

Course: TECHNOLOGICAL BASES OF THE AGRI-FOOD INDUSTRY**Type:** ELECTIVE**Degree:** 400 - UNDERGRADUATE DEGREE PROGRAMME IN OENOLOGY**Center:** 107 - E.T.S. OF AGRICULTURAL ENGINEERS OF C. REAL**Year:** 4**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 58540**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 20**Duration:** First semester**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** JOSÉ PÉREZ NAVARRO - Group(s): 20

Building/Office	Department	Phone number	Email	Office hours
San Isidro Labrador/302	Q. ANALÍTICA Y TGIA. ALIMENTOS		Jose.PNavarro@uclm.es	Tuesday, wednesday and thursday from 9:00 to 11:00 am.

2. Pre-Requisites

To take the Technological bases of the agri-food industry subject, no pre-requisites are required. It is recommended basic notions of Chemistry, Biochemistry or Microbiology.

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

The Technological bases of the agri-food industry subject is offered as an elective in the Degree in Oenology to complement the knowledge on preliminary, conversion, conservation and post-processing operations that are usually carried out in the agri-food industry and, particularly in the wine industry.

This subject allows to achieve professional competences related to the decision-making capacity on the most appropriate elaboration process, from the technological point of view and the quality of the final product.

4. Degree competences achieved in this course

Course competences

Code	Description
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.
CE01	Apply basic knowledge of mathematics, physics, chemistry and biology to enology.
CE02	Apply in an integrated way basic knowledge at the molecular, cellular and metabolic level in the control and selection of microorganisms as well as in plants.
CE04	Organize production based on market demands and technical, economic and legal possibilities, collaborating in decisions that affect vineyard management, harvesting and transport of the harvest to the winery.
CE05	Acquire knowledge about the chemical composition of grapes and wine as well as the chemical and biological processes that occur during the production and conservation of wines for its application in the development and progress of the enological industry.
CE06	Ability to manage the obtaining of musts for winemaking and conservation, the control of the fermentation of all types of wines, their aging, and the packaging, bottling and storage of wine and derived products according to legal, hygienic and environmental provisions.
CE07	Manage and supervise the reception and control of raw materials, the winery work: cleaning, racking, conservation, clarification, filtration, stabilization and conservation of wines, applying the knowledge acquired on the composition of grapes and wine and its evolution.
CE08	Ability to carry out or supervise routine or specific analytical, microbiological and sensory control in the vineyard and winery and apply it to the control of raw materials, enological products, intermediate products and final products throughout the entire production process.
CE09	Manage and control the quality of wine and derived products in the production chain, especially at critical points, as well as control and training of workers and hygienic-sanitary and safety conditions in the workplace according to safety requirements food in a wine company.
CE11	Ability to select and control the equipment, facilities and processes used in the winery, in order to increase its efficiency and the quality of the obtained products.
CE12	Ability to control and organize the production, management and marketing processes of different types of special wines, grape juices, mistelas, wine aperitifs, vinegars and other derivatives of musts, wine and related products.
CE13	Manage the use of by-products obtained in the process, obtaining wine alcohols and products derived or related to them, as well as the emission of pollutants, controlling compliance with environmental regulations.
CE14	Knowledge of the company, its management and organization under criteria of economic and environmental sustainability, which allow organizing production based on market demands and technical, economic and legal possibilities.
CG01	Develop motivation for quality, the ability to adapt to new situations and creativity.
CG02	Manage complex technical or professional projects. Solve complex problems effectively in the field of Enology.
CG03	Apply critical, logical and creative thinking, demonstrating innovative skills.
CG04	Work autonomously with responsibility and initiative, as well as in teams in a collaborative way and with shared responsibility.

CT03	Use correct oral and written communication.
CT04	Know the ethical commitment and professional deontology.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Complement the basic knowledge that allows the student to understand the nature of the transformations that food undergoes in the processes of the agri-food industries, in general, and of the wine industry in particular.

Complement the knowledge for the choice of the existing technological alternatives for the elaboration and conservation of a product in an agri-food industry.

To obtain knowledge about the management and organization of work in a company or institution related to the wine sector.

6. Units / Contents

Unit 1: MODULE I. PRELIMINARY OPERATIONS

Unit 1.1 CLEANING OF RAW MATERIALS

Unit 1.2 FOOD SELECTION AND CLASSIFICATION

Unit 1.3 PEELING

Unit 2: MODULE II. CONVERSION OPERATIONS

Unit 2.1 SIZE REDUCTION AND SIEVING OF SOLIDS

Unit 2.2 EMULSION AND HOMOGENIZATION

Unit 2.3 MIXING AND MOLDING

Unit 2.4 MECHANICAL SEPARATION

Unit 2.5 FILTRATION AND CONCENTRATION BY MEMBRANES

Unit 3: MODULE III. CONSERVATION OPERATIONS

Unit 3.1 FOOD PRESERVATION BY HEAT ACTION

Unit 3.2 FOOD SCALDING AND PASTEURIZATION

Unit 3.3 HEAT STERILIZATION

Unit 3.4 TREATMENT OF FOOD WITH NON-IONIZING ELECTROMAGNETIC RADIATION

Unit 3.5 FOOD IRRADIATION

Unit 3.6 TREATMENT OF FOOD WITH HIGH HYDROSTATIC PRESSURE

Unit 3.7 EMERGING TECHNOLOGIES FOR MINIMAL FOOD PROCESSING

Unit 3.8 FOOD PRESERVATION BY REDUCTION OF WATER ACTIVITY. DEHYDRATION

Unit 3.9 EVAPORATION

Unit 3.10 EXTRUSION

Unit 3.11 BAKING AND ROASTING

Unit 3.12 FRYING

Unit 3.13 REFRIGERATION

Unit 3.14 CONTROLLED AND MODIFIED ATMOSPHERES

Unit 3.15 FREEZING

Unit 3.16 LYOPHILIZATION AND CRYOCONCENTRATION

Unit 4: MODULE IV. POST-PROCESSING OPERATIONS

Unit 4.1 FOOD PACKAGING

Unit 5: MODULE V. MANAGEMENT AND USE OF WASTE

Unit 5.1 ENVIRONMENTAL ASPECTS OF FOOD PROCESSING

Unit 5.2 TREATMENT OF WATER AND EFFLUENTS

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	CE04 CE05 CE06 CE07 CE08 CE09 CE11 CE12 CE13 CE14 CT04	1.4	35	N	-	Lecture and guided discussion of theoretical content and problem solving. The teaching material will be available on the Virtual Campus. Student participation in the classes will be encouraged.
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB02 CB03 CE01 CE02 CE08 CE09 CE11 CE12 CG01 CG02 CG03 CG04	0.8	20	Y	Y	Guided practice in the laboratory. The knowledge and abilities acquired during this training activity will be assessed by means of a questionnaire.
Practicum and practical activities report writing or preparation [OFF-SITE]	Self-study	CB02 CB03 CB04 CE01 CE02 CG01 CG02 CG03 CG04 CT03	1.2	30	Y	Y	Elaboration of a practical report where the work carried out in the laboratory is reported and the results obtained are discussed. This training activity will be compulsory for all students regardless of whether they have done the practical work in the laboratory or not.
Study and Exam Preparation [OFF-SITE]	Self-study	CG04	2.4	60	N	-	Independent and autonomous work of the student.
							In the case of continuous assessment, mid-term tests will be

Mid-term test [ON-SITE]	Assessment tests	CB02 CB03 CB04 CE01 CE02 CE04 CE05 CE06 CE07 CE08 CE09 CE11 CE12 CE13 CE14 CG01 CG02 CG03 CT03 CT04	0.2	5	Y	Y	carried out which may partially or totally replace the written test performed in the final exam. For non-continuous evaluation, the knowledge acquired by the student during the course will be evaluated by means of a written test in official exams.
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
Final test	0.00%	70.00%	Written test consisting of evaluating the knowledge acquired by the students during the course.
Mid-term tests	70.00%	0.00%	The knowledge of the subject will be evaluated through mid-term tests in continuous assessment.
Laboratory sessions	10.00%	10.00%	Evaluation of the knowledge and skills acquired in the laboratory by means of a questionnaire.
Practicum and practical activities reports assessment	20.00%	20.00%	Preparation of a practical report on the work carried out in the laboratory and a discussion of the results in a clear and precise manner.
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).

Evaluation criteria for the final exam:

Continuous assessment:

For continuous assessment, the completion and delivery of all assessable and compulsory training activities will be proposed within a reasonable period of time and sufficiently separated from each other, which will be set by the lecturer. During the course, mid-term tests will be carried out which may partially or totally replace the written test performed in the final exam. The mark required for each of the assessable and compulsory training activities must reach a minimum of 40% of the grade for that activity. In order to pass the subject, a minimum mark of 5 points out of 10 will be required, after applying the percentages corresponding to each of the evaluable training activities.

Non-continuous evaluation:

Any student with difficulties in following the proposed development of the subject may change to the non-continuous assessment modality provided that the student has not participated during the period of classes in assessable activities that together account for at least 50% of the total assessment of the subject. In this case, it will be an essential requirement to deliver the compulsory and assessable training activities before taking the written test in the final exam. The knowledge acquired by the student during the course will be evaluated by means of a written test in official exams. The mark required in each of the compulsory and assessable training activities must reach a minimum of 40% of the grade for that activity. In order to pass the course, a minimum mark of 5 points out of 10 will be required, after applying the percentages corresponding to each of the assessable training activities.

Specifications for the resit/retake exam:

A final test will be carried out to assess all the competences to be acquired by the student, with theoretical and practical contents of the subject, regardless of whether a mid-term test has been passed. For the rest of the assessable and compulsory activities in which the student has obtained a minimum score of 40% of the grade, they will not be re-evaluated in the resit/retake exam, maintaining the grade of each activity. In order to pass the subject, a minimum score of 5 point out of 10 will be required, after applying the percentages corresponding to each of the evaluable training activities.

Specifications for the second resit / retake exam:

A final test will be held in which all the competences to be acquired by the student will be assessed, with both theoretical and practical contents of the subject, including all the assessable activities.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	35
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	30
Study and Exam Preparation [AUTÓNOMA][Self-study]	60
Mid-term test [PRESENCIAL][Assessment tests]	5
Global activity	
Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	35
Mid-term test [PRESENCIAL][Assessment tests]	5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	30
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	20
Study and Exam Preparation [AUTÓNOMA][Self-study]	60
Total horas: 150	

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
J.G. Brennan, J.R. Butters, N.D. Cowell, A.E.V. Lilley	Las operaciones de la ingeniería de los alimentos	Acribia, S.A., 3ª Edición			1998	
P. Fellows	Food processing technology: principles and practice	CRC, 3ª Edición			2009	
J.G. Brennan	Manual del procesado de alimentos	Acribia, S.A.			2008	
R.P. Singh, D.R. Heldman	Introducción a la ingeniería de alimentos	Acribia, S.A.			1998	
A. Ibarz, G.V. Barbosa-Cánovas	Operaciones unitarias en la ingeniería de alimentos	American Publishers Ltd.			1999	
J.A. Ordóñez	Tecnología de los alimentos I. Componentes de los alimentos y procesos	Síntesis, S.A.			1998	
P. Fellows	Tecnología del procesado de alimentos: principios y prácticas	Acribia, S.A.			2007	