COURSE DATA

DATA SUBJECT

Code: 33990
Name: Enology
Cycle: Undergraduate Studies
ECTS Credits: 4.5
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1103 - Degree in Food Science and Technology	Facultat de Farmácia i Ciències de L'alimentació	4	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1103 - Degree in Food Science and Technology	Enology	ELECTIVES

COORDINATION

CASTAGNINI JUAN MANUEL

SUMMARY

EThe subject Enology is an elective fourth year course of the Degree in Food Science and Technology, taught at the Faculty of Pharmacy and Food Science at the Universitat de València. This subject is offered in the first semester and has a total of 4.5 ECTS credits.

The aim of the subject is to provide a general understanding of the study of wine, by reviewing the most important technological, biochemical and microbiological aspects of winemaking This includes concepts related to both alcoholic fermentation and the malolactic fermentation. The course covers common enological practices in a winery, from the reception of raw materials to bottling, as well as various winemaking techniques, microbiological alterations, and enological biotechnology.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

To study the subject is of interest to have basic knowledge of chemical engineering, production of raw materials, food microbiology and biotechnology.

COMPETENCES / LEARNING OUTCOMES

1103 - Degree in Food Science and Technology

Conocer los fundamentos de la fabricación del vino a través de la comprensión de sus aspectos tecnológicos, bioquímicos y microbiológicos.

Manufacture and preserve food.

DESCRIPTION OF CONTENTS

TOPIC 1. Raw material: grape description and varieties.
Description of the grape ripening process. Composition of the grape at harvest time. Evolution of the main grape components during ripening. Setting of harvest dates. Grape varieties.

TOPIC 2. Preliminary operations.
Winery cleaning. Grape transport. pH adjustment. Use and functions of sulfur dioxide. Cooling methods. Fermentation rooms.

TOPIC 3. Vinification techniques.
Destemming. Crushing. Pressing. Thermovinification. Clarification of wines.

TOPIC 4. Red wine production.
Maceration. Duration of vatting. Racking practice. Conservation under nitrogen. Vinification with carbonic maceration. Wine breeding and aging

TOPIC 5. White and rosé wine production.
White wine vinification. Rosé wine vinification.

TOPIC 6. Special vinifications.
Wines made with the *méthode champenoise*. Sparkling wines. Sherry wines. Natural sweet wines. Port wines.

TOPIC 7. Yeasts involved in vinification.
Alcoholic fermentation. Isolation, counts and identification. Morphological, physiological and genetic features of yeasts. Growth of yeasts during alcoholic fermentation. Sugar metabolism, nitrogen compounds and organic acids. Nutritional requirements of yeasts. The killer factor. Selection and starter cultures. Genetic improvement of yeasts for winemaking. Use of enzymes in winemaking

TOPIC 8. Lactic acid bacteria involved in vinification.
Malolactic fermentation. Isolation, counts and identification. General characteristics of lactic acid bacteria: morphology, structure, physiology, biochemistry and genetics. Evolution of bacterial populations. Use of selected lactic bacteria in wine. Selection criteria. Development of a natural starter culture. Nutritional requirements.

TOPIC 9. Microbial spoilage of wines.
Changes caused by yeasts. Spoilage by lactic acid bacteria. Changes caused by acetic acid bacteria. Spoilage by other filamentous fungi in grapes and wines.

TOPIC 10. Botrytis infection.
Biological cycle. The infection process. Gray rot, chemical and microbiological changes. Botrytis grapes vinification. The noble rot. Control of *B. cinerea*. Determination of the infection.

TOPIC 11. Bottling
Pre-bottling operations. Types of containers used for wines. Filling, sealing, and labeling techniques. Hygiene conditions in bottling. Other alternative packaging procedures. Storage and preservation of bottled wine. Post-bottling risks and alterations.

TOPIC 12. Winemaking By-products
Definition and types of by-products generated in the winery: pomace, lees, vinasse. Industrial and agri-food utilization. Distillation of by-products. Extraction of bioactive compounds.

TOPIC 13. Wine Tasting. Wine and Health
Basic principles of wine tasting. Visual, olfactory, and gustatory phases. Sensory parameters and their evaluation. Factors influencing sensory perception. Introduction to technical sensory analysis. Moderate wine consumption and health: phenolic compounds and beneficial effects. Risks associated with excessive consumption.

Laboratory work

1. Execution of a Micro-vinification with Sulfur Dioxide Addition and Inoculation with Selected Yeast.
2. Analytical and microbiological control of vinification.
3. Morphological analysis of yeast and lactic bacteria.
4. Winery visit.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	1,00
Theory	25,00
Seminar	2,00
Laboratory	15,00
Total hours	**43,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	15,00
Independent study and work	15,00
Preparation of lessons	17,50
Preparation for assessment activities	20,00

Resolution of case studies	0,00
Total hours	**67,50**

TEACHING METHODOLOGY

Method	Hours
Seminars	2
Theory	25
Practice	15
Tutoring	1

Teaching is based on the individual study of the topics, reinforced by **organized tutorials**. Students must prepare proposed activities prior to the indicated tutorial dates; these activities will strengthen the learning of specific aspects of the program. Classes will be taught with the aid of **audiovisual technical material**, which will be made available to students on the **virtual classroom** platform.

Laboratory practicals are designed to foster the connection between theoretical knowledge and its practical application. A **booklet with procedures**, along with a series of questions and problems, will be provided beforehand. Students will be required to solve these and submit them to the instructor within a specified timeframe after completing the practical sessions.

Seminars will be conducted on topics proposed by the instructor and related to the course content. The development of each seminar will be **supervised by the instructor**. Submissions must be presented in writing and will be **verbally presented by the students**.

During theoretical and practical classes, examples of the course content's applications in relation to the **Sustainable Development Goals (SDGs)** will be highlighted. This will also be incorporated into proposed topics for coordinated seminars. The aim is to provide students with the knowledge, skills, and motivation to understand and address these SDGs.

EVALUATION

The evaluation of knowledge acquisition and the development of competencies and skills will be carried out through the following assessable components:

1. **Written Examination.** A written examination will be conducted to evaluate the knowledge and comprehension of the minimum theoretical content established for the course (60%).

2. **Practicals.** Evaluation of laboratory work through supervision of the tasks performed, the ability to solve the experimental problems posed, and the skill in producing well-detailed and organized reports of experimental results. The written examination will include questions about practicals (20%).

3. **Seminars.** Completion, presentation, and defense of topics related to the course, in accordance with the coordinated seminar regulations available on the Degree's website. The written work will be assessed, as well as the level of comprehension of the content and the skills for its exposition, defense, and discussion (10%).

4. **Group Tutorials.** Evaluation of the work completed during tutorials, the ability to solve the proposed activities, and the degree of student participation (10%).

It is necessary to acquire 5 out of 10 points in the written examination, which includes both theory and practical questions, to pass the course.

Attendance at practicals, tutorials, and seminars is mandatory to pass the course. It is not mandatory for repeat students during the two academic years following their completion, during which their grades will be retained.

Evident copying or plagiarism of any assignment that forms part of the evaluation will result in failure of the course, followed by the appropriate disciplinary procedures. Please note that, in accordance with Article 13.d) of the University Student Statute (Royal Decree 1791/2010, of December 30), it is a student's duty to refrain from using or cooperating in fraudulent procedures during assessment tests, in assignments, or with official university documents. In the event of fraudulent practices, the "Action Protocol for fraudulent practices at the Universitat de València" will be applied (ACGUV 123/2020): https://www.uv.es/sgeneral/Protocols/C83sp.pdf.

REFERENCES

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