



DEGREE CURRICULUM
OENOLOGY

Coordination: ROMERO FABREGAT, MARIA PAZ

Academic year 2023-24

Subject's general information

Subject name	OENOLOGY			
Code	102255			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Food Science and Technology	4	OPTIONAL	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	2	1	3
	Number of groups	1	1	1
Coordination	ROMERO FABREGAT, MARIA PAZ			
Department	FOOD TECHNOLOGY, ENGINEERING AND SCIENCE			
Teaching load distribution between lectures and independent student work	Face-to-face hours 60 Non presencial hours: 90			
Important information on data processing	Consult this link for more information.			
Language	Spanish			
Distribution of credits	See development plan			

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
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Subject's extra information

Oenology is an optional subject for extension of the module dedicated to the study of food manufacturing process technology. The knowledge taught is aimed at students learning to define complete winemaking processes. Students should have prior knowledge of physics, chemistry and food biochemistry, as well as auxiliary processes and systems in the food industry.

Learning objectives

The student, when passing the subject, must be able to:

- 1 Describe the winemaking processes.
- 2 Assess the importance of the quality and composition of the grape in the quality of the final product.
- 3 Associate composition and defects in the product with raw materials and applied technology.
- 4 Identify processing alternatives in the field of oenology.
- 5 Select technological alternatives and select industrial equipment.
- 6 Calculate the requirements required for some auxiliary facilities.
- 7 Know the legislation referring to products and processes.

Competences

Basic skills:

CB1: That students have demonstrated to possess and understand knowledge from the base of general secondary education at a level that, although supported by advanced textbooks, also includes some aspects that involve knowledge from the forefront of that area .

CB2: That students know how to apply their knowledge to their work or vocation in a professional way and possess the competencies that are usually demonstrated through elaboration and defense of arguments and problem solving within their area of study

CB3: That students have the ability to gather and interpret relevant data (usually into their study area) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature.

CB4: That students can transmit information, ideas, problems and solutions to both a specialized and non-specialized audience

CB5: That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.

General competences

CG1: Analyze specific situations, define problems, make decisions and implement action plans in search of solutions.

CG2: Interpret studies, reports, data and analyze them numerically.

CG3: Select and manage the written and computerized information sources available related to the professional activity.

CG4. Work alone and in a multidisciplinary team.

CG5: Understand and express yourself with the appropriate terminology.

CG6. Discuss and argue in various forums.

CG7. Recycle in new technological advances through continuous learning.

CG8. Value comprehensive training, personal motivation and mobility.

CG9: Analyze and assess the social and ethical implications of professional activity.

CG10: Have a critical and innovative spirit.

CG11: Analyze and assess the environmental implications in their professional activity.

Transversal competences

CT1: Correctly present information in oral and written form (UdL strategic competence)

CT3: Use existing IT and communication tools as support for the development of their professional activity (UdL strategic competence))

CT4. Respect the fundamental rights of equality between men and women, the promotion of Human Rights and the values of a culture of peace and democratic values

Reinforcement of specific competences of modules 3 and 4

Module 3 Competences: Food Science

CE1. Select and apply the physical and mathematical foundations necessary for the development of other disciplines and the activities of the profession.

CE2. Identify and apply the chemical foundations necessary for the development of other disciplines and the activities of the profession.

CE3. Identify and apply the fundamentals of Biology and Human Physiology necessary for the development of other disciplines and the activities of the profession.

CE4. Select and apply the basic concepts of the statistical method, being able to statistically analyze the results of studies and interpret them critically.

Module 4 Competences: Food Technology

CE20. Evaluate the characteristics of the main plant varieties and their aptitude for the different transformation processes.

CE21. Discuss the rationale and apply basic operations to food manufacturing processes.

CE22. Recognize food processing equipment and know how to use it.

CE23. Outline, based on flow diagrams, the processes of food preparation and preservation.

CE24. Identify and evaluate raw materials, ingredients, additives and technological aids for use in the agri-food industry.

CE25. Explain the role of ingredients and food additives.

CE26. Apply basic knowledge about raw materials, ingredients and additives to food formulation.

CE27. Interpret the physical and chemical changes that occur during the different food-making processes.

CE28. Modify the processes of making a food based on some objectives.

CE29. Select equipment and organize food preparation and packaging lines.

CE30. Develop new processes and products.

CE33. Estimate equipment capabilities for production lines and auxiliary systems needs.

Subject contents

Theoretical classes

CHAPTER I INTRODUCTION

Unit 1.-The oenological sector

Current situation of the oenological sector. Surfaces of vineyard. Production of wine and derivatives. Market of the wine: consumption and export. Mechanisms of regulation. DAFO matrix of the oenological sector. Activities of promotion and diffusion of wines

CHAPTER 2 SPECIFICATIONS OF PRODUCT AND RAW MATERIAL.

Unit 2.-The wines

Definition of wine and other oenological products according to the OCM. Types of wines. Composition of the wine. Nutritional quality of the wine. General notions of the process of production of wines. Legal aspects that concern the production of wines.

Unit 3.-Raw materials: the grape

The grape for vinification: cultivars. The cluster of grape: composition. Study of the ripening of grapes: metabolism of sugars, acids and phenols. Evaluation of the quality of the grape.

Unit 4.-Harvests, transport and receipt of the grape.

The harvest. Transport of the grape to the winery. Facilities for the grape control in receipt. Controls of raw material. Systems of unload.

CHAPTER III EXTRACTION TECHNOLOGY AND MUST CONDITIONING

Unit 5.-Extraction of must

Introduction. Destemming and crushing of grapes. Pumping of mash. Maceration prefermentative and drained. Pressing. Analysis of alternatives in the process of extraction of must. Special musts.

Unit 6.-The sulphur dioxide in enology.

Introduction. Actions of the sulphur dioxide. Chemical equilibrium of the sulphur dioxide in musts and wines. The sulphur dioxide addition. Legal aspects on the use of the sulphurous. Substitute or complementary preservative agents.

Unit 7.- Must conditioning.

Muts composition. Must clarification. Clarification consequences. Coadjuvants for clarification: proteins, inorganics agents and enzims. Techniques of must clarification: static and dinámic. Correccions of must composition: alcool increases, acidity corection and others.

CHAPTER IV FERMENTATION TECHNOLOGY.

Unit 8.- White wines fermentation technology

Physical and chemical transformations. The role of the low temperature. Fermentation at controlled temperature. Interventions during fermentation. Tanks and equipments for controlled fermentation

Unit 9.- Red wine fermentation technology.

Simultaneously maceration and fermentation. Evolution od colour. Controls of maceration and primary fermentation. Pigeage. Separation of skins and seeds. Pressing. Special vessel for fermenting red wines: past and presents.

Unit 10.- Special macerations for producing red wines

Introduction. *Carbonic maceration*. Anaerobic metabolism of grapes. Microbiological aspects. Modern technology form carbonic maceration. *Thermovinification*: Introduction. Effects of heat on the extraction of phenols and other components of grapes. Effects of heat on microorganimss and enzims. Effect of heat on organoleptic characteristics.Modern technologies for the thermovinification . Quality of non traditional red wines

Unit 11.- Sparkling wines technology

Sparkling wines normative. Typus of sparkling wines. Characteristics of base wines. Steps of the productions of sparkling wines-cava:addition of *tirage* liquor, secondary fermentation, aging on lees, riddling, disgorging, dosage and bottling.

CHAPTER V WINE TRANSFORMATIONS

Unit 12.- Malolactic fermentation

The malolactic fermentation: chemical modifications. Best conditions for malolactic development. Use of starters.

Unit 13.- Storage of wines

Trasiegos. Conservación en atmósferas inertes. Rellenado de envases. Mezclas: normativa relativa a mezclas.

Unit 14.- Biological and physico-chemical transformation of finished wines.

Diseases and defects of the wines. Microbian aerobic transformations. Microbic anaerobic transformations. Defects for the presence of sulfur derivative compounds. The oxidative, proteinic and metallic failures. Loss of colour. Tartaric salts precipitation. Characterization of the precipitates on wines. Sensitivity tests.

Unit 15.- Ageing of wines.

The oxygen in the wine chemistry. Modifications of wines along the ageing period. Ageing in barrels. Ageing in bottles. Oxidative ageing: Sherry wines.

CHAPTER VI POSTFERMENTATIVE TREATMENTS

Unit 16.- Fining.

Introduction. Coloids in wines. Mechanisms of the clarifiants action. The fining agents: organic, mineral and complex. Effects of clarifiants on wines composition. The fining in the practice. Recommendations for a correct fining.

Unit 17.- Filtration and centrifugation.

Filter aids. The techniche of wine filtration. Laboratory tests. Filtration with diatomaceous earths and preformed plaques. Sterilization with membranes. Cross-filtration. Selection of the best technique. Tipus of filters: brochures. Centrifugation of wines.

Unit 18.- Stabilization.

Aim of stabilization. Reducing metal treatments. Acidity correction. Colour correction. Tartaric stabilization. Thermal stabilization. Heat bottling. Oenological products for stabilizations of wines.

Unit 19.- Bottling.

Squeme of a bottling line. Materiales for bottling:bottles and new packages, cork and alternative wines closures, capsules and labels. Filling systems. Closing systems. Labelling.

CHAPTER VII VINERIES.

Unit 20.- Vineries.

Plan distribution. Hygiene in the vinery. Preparation of building, machinery and auxiliary equipments. Needs of oenological products in campaign.

Activities

Laboratory and pilot plant

Practice 1 - Winemaking: red wine productios

Practice 2 - Fining of wines: fining agents comparison

Practice 3 - Filtration of wines: diatomaceus earths assay

Visits

Throughout the course, if possible, 1 or 2 wineries will be visited. There will be also commented sessions of virtual visits and youtube videos.

Methodology

Activity	Description	Face-to-face activities		Non presential activity	Evaluation			Total time
		Objective	Hours		Student work	Hours	Hours	
Master class	Master class magistral (Class room, Large group)	Explanation of the main concepts	30	Study: Knowing, understanding and synthesizing knowledge	60	4	94	3.76
Problems and cases study	Participatory class (Classroom. Large group)	Resolution of problems and cases related to the selection of equipment for winemaking	6	Learn to solve problems and cases	12		18	0.72
Practices	Laboratory and Pilot plant practices (Medium Group)	Execution of the practice: understanding phenomena, measuring...	18	Study and Write reports	8		26	1.04
Visits	Winery visit		2	Study and write report	2		4	0.16
Activities	Student work (individual or group)	Guide the student at work (during tutoring hours) memory	2	Bibliographic study	8		10	0.4
Totals			56		90	4	150	6

Development plan

The development plan will be made according to what is described in the methodology in the schedule assigned by the Directorate of Studies.

The practical classes will be face-to-face and the schedule will be agreed at the beginning of the course, depending on the time availability of the students.

Evaluation

UdL exam regulations

The statements of the exams will be delivered in Spanish.

Exams can be taken in Catalan or Spanish. Exchange students can use English, French and Italian.

Minimum mark in written tests: 4.5

Blocks scoring less than 30% are not eligible for recovery

Block	Activity	Number	Weighting in the final grade

Block 1 and 2	Written tests on the theory taught	2	35 / 35
Block 3	Laboratory work and memory of practices. Written test	1	15
Block 4	Activities.	1	10
Block 5	Commitment to learning, interest, participation, attitude	1	5
Total			100

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