



DEGREE CURRICULUM
**PLANT FOOD PROCESSING
TECHNOLOGY II**

Coordination: GRAELL SARLE, JORGE MARIANO

Academic year 2019-20

Subject's general information

Subject name	PLANT FOOD PROCESSING TECHNOLOGY II			
Code	102589			
Semester	2nd Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Food Science and Technology	3	COMPULSORY	Attendance-based
	Bachelor's Degree in Agricultural and Food Engineering	3	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	1	0.6	4.4
	Number of groups	4	3	2
Coordination	GRAELL SARLE, JORGE MARIANO			
Department	FOOD TECHNOLOGY			
Teaching load distribution between lectures and independent student work	Classroom (attendance) hours: 60 Non-contact hours: 90			
Important information on data processing	Consult this link for more information.			
Language	Catalan : 50% Spanish: 50%			
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Subject's extra information

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

Having overcome the fundamental subjects of the first and second year, third year in this course is intended to deepen the student's practical study of industrial processes of production of oils and fats in order to acquire the knowledge and skills of a technical expert in the field of oils and fats.

DEGREE IN AGRO-FOOD

Subject in the whole curriculum

The subject "Technology of processing plant foods I" belongs to the block of Food Industries.

Impart knowledge are aimed at the student learns to define complete manufacturing process of certain foods. The study of different industries include: a) sections of the industry and its operation, b) legislative, c) characteristics and composition of raw materials, d) diagram and operations processes, e) product characteristics , f) process control parameters and product quality g) management and use of waste and by-products. The industries included in this material are the fruits and vegetables (fresh), canned juices and vegetable sector.

Learning objectives

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

The student to pass the course, must be able to:

- Assess the characteristics of different types of oil feedstocks that can be used in the processing industry of oils and fats.
- Specify the requirements to be met by oil raw materials for use in industrial processes of oils and fats.
- Select and plan the necessary steps to carry out a particular process of development of an oil or fat.
- Describe the action of the different technical parameters of an operation or industrial treatment on changes in the characteristics of oils and fats.
- Select the necessary equipment to be applied in each of the stages of a development process oils and fats.
- Solve the sizing of the required equipment capacity processing of oils and fats.
- Compare the different processes which can be applied for obtaining and / or processing of oils and fats, from a technological point of view and engineering.
- Specify the characteristics that, according to the relevant technical regulations submitted by different types and classes of commercial

oils and fats.

- Interpret the analytical values of the characteristics of the products and by-products obtained during the development of an oil or fat to proceed with the regulation of the corresponding processes.
- Outline graphically sections that are part of an industry processing of oils and fats, to develop a preliminary design industry.
- Demonstrate knowledge of the nutritional virtues and the different possible uses of oils and fats in the food industry.

DEGREE IN AGRICULTURAL ENGINEERING AND FOOD

It is intended that the student is able, in the context of different food industries studied in this field in:

1. Describe the food manufacturing processes.
- Two. Manage and know how to apply the various existing provisions affecting the food industries.
- Three. Outline, flowchart, process of preparing and preserving food.
- April. Identify raw materials, ingredients, additives and other materials for use in the food industry.
- May. Assess the influence of the composition and properties of the raw material quality
6. Final product.
7. Interpret physical and chemical changes that occur within the various food manufacturing processes.
8. Changing processes based on objectives.
9. Organize production line manufacturing in food industry.
10. Associate composition and defects in the product with the raw materials and applied technology.
11. Select equipment for production lines and food packaging.
12. Sizing production lines and estimate the capabilities of processing equipment.
13. Having ability to develop new processes and food products
14. Plan the management and use of products

Competences

GRAU EN CIÈNCIA I TECNOLOGIA D'ALIMENTS

Competències generals

CG2: Que els estudiants sàpiguen aplicar els seus coneixements al seu treball o vocació d'una manera professional i tinguin les competències que acostumen a demostrar-se mitjançant l'elaboració i defensa d'arguments i la resolució de problemes dins del seu àrea d'estudi.

CG3: Que els estudiants tinguin la capacitat de reunir i interpretar dades rellevants per emetre judicis que incloguin una reflexió sobre temes rellevants d'índole social, científica o ètica.

CG4: Que els estudiants puguin transmetre informació, idees, problemes i solucions a un públic tant especialitzat com no especialitzat.

CG6: Analitzar situacions concretes, definir problemes, prendre decisions i implementar plans d'actuació en la recerca de solucions.

CG7: Interpretar estudis, informes, dades i analitzar-les numèricament.

CG8: Seleccionar i fer anar les fonts d'informació escrites i informatitzades disponibles relacionades amb l'activitat professional.

CG9: Utilitzar les eines informàtiques i de la comunicació existents com a suport pel desenvolupament de la seva activitat professional (competència estratègica UdL)

CG10: Treballar sol i en equip multidisciplinar.

CG11: Entendre i expressar-se en la terminologia adient.

CG12: Presentar correctament informació de forma oral i escrita (competència estratègica UdL)

CG18: Tenir un esperit crític i innovador.

CG19: Analitzar i valorar les implicacions mediambientals en la seva activitat professional.

Cometències específiques

Tecnologia dels aliments

CE20: Avaluar les característiques de les principals varietats vegetals i la seva aptitud pels diferents processos de transformació.

CE22: Conèixer els equips de processat d'aliments i saber utilitzar-los.

CE23: Esquematitzar, en base a diagrames de flux, els processos d'elaboració i conservació d'aliments.

CE24: Identificar i avaluar matèries primeres, ingredients, additius i coadjuvants tecnològics d'ús en la indústria agroalimentària.

CE26: Aplicar els coneixements bàsics sobre matèries primeres, ingredients i additius a la formulació d'aliments.

CE27: Interpretar els canvis físics i químics que es produeixen durant els diferents processos d'elaboració d'aliments.

CE28: Modificar els processos d'elaboració d'un aliment sobre la base d'uns objectius.

CE29: Seleccionar equipament i organitzar les línies d'elaboració i envasat d'aliments.

CE30: Desenvolupar nous processos i productes.

CE31: Identificar i valorar les diverses parts d'un projecte d'una indústria agroalimentària.

CE32: Dimensionar línies de producció.

CE33: Estimar les capacitats d'equips per a les línies de producció i les necessitats de sistemes auxiliars.

GRAU EN ENGINYERIA AGRÀRIA I ALIMENTÀRIA

Competencias generales

CB1. Que los estudiantes hayan demostrado poseer y comprender conocimientos en un área de estudio que parte de la base de la educación secundaria general, y se suele encontrar a un nivel que, si bien se apoya en libros de texto avanzados, incluye también algunos aspectos que implican conocimientos procedentes de la vanguardia de su campo de estudio.

CB2. Que los estudiantes sepan aplicar sus conocimientos a su trabajo o vocación de una forma profesional y posean las competencias que suelen demostrarse por medio de la elaboración y defensa de argumentos y la resolución de problemas dentro de su área de estudio.

CB3. Que los estudiantes tengan la capacidad de reunir e interpretar datos relevantes (normalmente dentro de su área de estudio) para emitir juicios que incluyan una reflexión sobre temas relevantes de índole social, científica o ética.

CB4. Que los estudiantes puedan transmitir información, ideas, problemas y soluciones a un público tanto especializado como no especializado.

CB5. Que los estudiantes hayan desarrollado aquellas habilidades de aprendizaje necesarias para emprender estudios posteriores con un alto grado de autonomía.

CG1. Capacidad para la preparación previa, concepción de proyectos que tengan por objeto la construcción que por su naturaleza y características queden comprendidos en la industria agroalimentaria

CG6. Capacidad para la dirección y gestión de toda clase de industrias agroalimentarias, con conocimiento de las nuevas tecnologías, los procesos de calidad,

CG8. Capacidad de resolución de problemas con creatividad, iniciativa, metodología y razonamiento crítico.

CG10. Capacidad para la búsqueda y utilización de la normativa y reglamentación relativa a su ámbito de actuación.

CG12. Capacidad para el trabajo en equipos multidisciplinares y multiculturales. CG13. Corrección en la expresión oral y escrita

Competencias específicas

CEMC8. La gestión y aprovechamiento de subproductos agroindustriales.

CEMC9. Toma de decisiones mediante el uso de los recursos disponibles para el trabajo en grupos multidisciplinares.

CEIAA1. Ingeniería y tecnología de los alimentos: Tecnología de alimentos. Procesos en las industrias agroalimentarias.

Subject contents

DEGREE IN FOOD SCIENCE AND TECHNOLOGY

PART I - CEREAL TECHNOLOGY

Item 1 -. Baking.

Introduction - Definition and types of bread - Raw materials - Milling of cereals: Manufacture of flour - flour quality parameters - Graph and manufacturing stages. machinery and controls at each stage - aging phenomenon. bread - Application of cold: precooked frozen masses - Application of modified atmosphere packaging.

Item 2 -.Made biscuits.

Introduction - Definition and types of cookies - Raw materials: Features - Diagram and manufacturing stages. Purpose and machines at each stage.

Item 3 -. Manufacture of pasta.

Introduction - Definition and types of food pastes - Features quality pastes - Raw materials: Features - Diagram and manufacturing stages. Purpose machinery and controls at each stage.

PART II - OLIVE OIL TECHNOLOGY

Item 4 -. Olive oil. Composition and quality.

Composition of olive oil -. Classification of olive oils -. Quality of olive oils -. Considerations on the parameters of quality and purity of olive oils -. Diagrams processing of virgin olive oils.

Item 5 - The raw material. Olive. Previous operations process.

The olive. Structure and composition -. Olive ripening -. Variety -. Influence of climatic and agronomic factors -. Collection of olives -. Transportation of olives -. Reception of olives -. Cleaning and washing of olives -. Storage of olives -. Controls in olives.

Item 6 -. Operations about olive paste preparation.

Milling the fruit. Objectives - Types of mills. Comparison - Malaxation of olive paste.- Characteristics of malaxators - Features of olive paste - Difficult olives paste - Adding technological adjuvants.

Item 7 -. Operation of oil extraction. I. - Partial extraction system

Fundamentals of partial extraction -. Partial extraction equipment -. Factors influencing extraction -. Coadjuvants technology -. Handling process -. Advantages and disadvantages of partial extraction.

Item 8 -. Operation of oil extraction. II -. Pressing system.

Fundamentals of pressing system -. Description hydraulic press -. Operation pressing -. Factors affecting the operation -. Difficult paste. Technological Coadjuvants -. Advantages and disadvantages of the press system.

Item 9 -. Operation of oil extraction. III -. System of centrifugation.

Extraction of oil by centrifugation. Theoretical foundations - Description of decanter. Operation -. Factors affecting the operation -. Advantages and disadvantages of centrifuge system -. Centrifugation system of 2 phases -. Comparison between 2-phase centrifugation and 3-phase -. Technological coadjuvants.

Item 10 -. Operation of liquid phases separation.

Separation of liquids by decantation. Factors -. Facilities -. Separation of liquids by centrifugation. - Vertical centrifuges - Mixed system. Decantation and centrifugation.

Topic 11.- Management and process control.

Visual and analytical controls in products and byproducts. - Regulation of the press system - Regulation of centrifuge system 3 phase - Regulation of system 2-phase centrifugation - Process automation.

Item 12 -. Final operations. Storage and packaging of oils

Conservation of virgin olive oil: alterations - Properties of store deposits - Filtration of oils - Types of filters and application - Packaging oils - Terms and packaging types.

Item 13 -. Disposal and utilization of by-products of olive oil.

By-products: quantities and characteristics - Olive pomace. - Waste water. Environmental problems -. Disposal and utilization of waste water.

PART III: TECHNOLOGY OF SEED OILS.

Item 14 -. Preliminary operations.

Receiving seeds -. Storing seeds. Conditions -. Storage silos. Types -. Drying seeds. Types of dryers -. Cleaning and preparation of seed -. Crushing and laminate seeds -. Conditioning of seed.

Item 15 -. Removing oil per pressure.

Pressure oil extraction. Fundamentals - Continuous presses. - Advantages and disadvantages of the system pressure - Diagram of pressing system..

Item 16 -. Extraction by solvent oil.

Solvent extraction. Basics and benefits - Factors influencing solvent extraction - Extraction systems: percolation, immersion and mixed - Types of percolation extractors - Types of immersion extractors - Types of mixed extractors. - Special processes of solvent extraction.

Item 17 -. Final extraction operations.

Filtration of miscella -. Preconcentration miscella -. Distillation of miscella -. Desolventization of turtos -. Controls.

PART IV: TREATMENT OF OILS AND FATS

Item 18 -. Refining of oils and fats.

Objectives of the refining of oils and fats. - Degumming of oil. Equipment for neutralization of oils: chemical system - Bleaching of oils. Equipments -. Deodorization of oils.- Physical refining equipment, oils and fats -. Winterización of oils.

Item 19 -. Modification of oils and fats.

Hydrogenation of oils and fats. Fundamentals -. Applications in the food industry -. Hydrogenation equipment and facilities -. Problems of trans fatty acids -. Fat Interesterification - Margarine and "shortenings" - Other processes:. Obtaining biodiesel.

Practical activities

Seminars:

- Interpretation of technical information from industrial equipment catalogs.
- Interpretation of information in scientific and technical articles.
- Analysis of technical regulations.
- Analysis of the contents of a draft of an industry.
- Exercises dimensioning calculations on an industrial process equipment.

Laboratory Practice:

- Extraction of olive oil for a centrifuge system (Abencor equipment).
- Analysis of parameters of quality and purity in oils.
- Sensory oil tasting.

DEGREE IN AGRICULTURAL ENGINEERING AND FOOD

CEREAL TECHNOLOGY

Item 1 Cereal storage

The grain and conditioning. Factors affecting grain quality. Treatments to stored grains. Grain drying and aeration.

Item 2 Dry Milling: wheat flour

Definitions and specifications of the mill products. Dry milling process: fundamentals. Cleaning and conditioning of the wheat. Grinding and classification. Storage and flour treatment.

Item 3 Corn Processing

Maize milling techniques: wet and dry roads. Products derived from the wet milling and dry. Milling process of corn wet. Cornstarch applications. Dry milling process of corn.

Item 4 Rice Processing

Products derived from processing rice. Process for obtaining white rice. Special Rice: parboiled and enriched.

Item 5 Technology malting

Processing of barley: Reception and quality control raw material. Storage. Grain cleaning and sorting. Malting: steeping, germination and drying. Degerminated and final cleaning. Composition and quality of malt.. Schematic of a malting.

Item 6 breadmaking process

Bread: definition and types. Diagram of the process. Mixing Operations: purpose, methods and equipment. Operations on mass: rest, division, and formed. Fermentation operation: principles, steps, factors and machinery. Controlled fermentation. Process and equipment. Cooking. Phenomena in the dough. Ovens. Conservation bread. Aging. Example baking industry.

Item 7 Process of making pasta

Definition and types of pasta. Specifications of raw materials for the production of pasta. Pulping process: Mixing and kneading, extrusion and cutting, drying. Equipment: Mixers, Extruders, Dryers. Parameters of quality pasta. Example pasta processing plant.

Item 8 Process of making cookies

Definition and types. Specifications flour cookie. Chemical agent.Process of making cookies: cookies, crackers and wafers. Example biscuit industry.

Item 9 Process of making breakfast cereals

Definition and types. Process of making flakes and puffed cereals. Enrichment of cereal.

Item 10 Beer

The brewing industry in Spain. Regulations of beer. Beer: definition and specifications. Permitted practices and prohibitions. Types of beer. Beer and health. General notions about the process of making beer.

Item 11 Brewing: Commodities

Carbohydrates. Quality criteria of malting barley. Attachments: raw grains and sugary compounds. Water. Water use in the malting and brewing industries. Effect of some ions. Corrections water. Hops. Description hops. Industrial classification. Composition of hops. Quality assessment of hops. Storing hops. Commercial presentations.

Item 12 Manufacture of beer wort

Introduction. The mashing. Crushing. Maceration. Filtering. Boil. Cooling. Composition and quality of the beer wort.

Topic 13 The fermentation

Fermentation objective. Preparation of wort for fermentation: aeration and seeding of microorganisms. Transformations during fermentation. Control of fermentation. Models of high, low and fast fermentations. Equipment for fermentation. Yeast recovery.

Item 14 Post-fermentation operations: the maturation of beer, final treatment and shipping.

Introduction. Second fermentation. Preventing turbidity. Cooling resistance. Artificial carbonation and standardization. Maturation of taste. Incorporation of additives. Models saved driving. Filtration: filter media in the brewing industry, filter selection for the beer industry. Pasteurization. Packaged.

OENOLOGY

Item 15 Wine

Definition of wine and other enological products according to the OIV. Wines. Wine composition. Nutritional quality of the wine. Outline the process of winemaking. Legal issues affecting winemaking.

Item 16 Harvest, shipping and receiving.

The wine grape: varieties. The bunch of grapes: composition. Study ripening of the grapes. Assessment of the quality of the grapes. Harvest. Transport of grapes to the winery. Facilities at the front desk controls. Control of raw materials. Discharge systems.

Topic 17 Technology juice extraction.

Introduction. Crushing and stemming. Pumping whole or crushed grape pulp. Maceration and drained. Pressing. Analysis of alternatives in the process of extraction of wort.

Topic 18 Conditioning musts.

The sulfur in winemaking. State of sulfur in musts and wines. The sulphite. Legal aspects of the use of sulfur. Substitute or complementary products. Clarification of musts. Effects of racking. Aids for racking: clarifiers and enzymes. Settling techniques: static and dynamic.

Topic 19 Technology fermentation of white wines.

Physical and chemical changes during fermentation. Importance of the fermentation temperature. Controlled fermentation. Interventions during fermentation. Facilities for controlled fermentation.

Topic 20 Technology production of sparkling wine

Rules applicable to sparkling wines. Features of cuvées. Stages of development of natural sparkling: circulation, fermentation, disgorgement and shipping.

Item 21 fermentation technology red

Fermentation and maceration contemporary: Physical and chemical modifications. Control of maceration. Descube. Exhaustion of skins. Carbonic maceration. Thermovinification. Facilities traditional maceration. Current trends in equipment for maceration. The malolactic fermentation changes. Ideal conditions for malolactic fermentation. Use of bacterial cultures.

Topic 22 Maturation and aging of wines.

The role of oxygen in wine storage. Changes in aging. Aging in barrels. Bottle aging. Technical innovations and aging wine.

Item 24 Clarification. Filtration and centrifugation.

Introduction. The colloids in wine. The actions of the fining agents: mechanism and effects on clarifying wines. Fining: Inorganic and protein complexes. The practice of clarification. The filter media in oenology. Filtration techniques in the wine industry. Filtration land and precast beds. Sterile filtration membranes. Tangential filtration. Selection filtering technique. Spin wine.

Item 25 Stabilization

Stabilization:objective. Demetallating Treatments: Potassium ferrocyanide and phytates. Correction of acidity. Color Correction. Stabilization cooling: tartaric stabilization. Stabilization by heating: pasteurization. Adding stabilizer enological products with purpose.

OLIVE OIL

Item 26 Olive oil

Composition of olive oil - Classification of virgin olive oils - Quality olive oils - Considerations on the physicochemical and organoleptic parameters - Preparation of the olive oil: flowcharts - Typical sections in a industry

Topic 27 -. Preliminary operations.

The olive. Structure and composition -. Ripening fruit -. Variety -. Influence of climatic and agronomic factors. -. Collection and transportation of olives -. Reception of olives -. Cleaning and washing the olives -. Storing olives -. Controls -. Milling fruit. Types of mills -. Malaxation of the paste. Mixers -. Properties of paste -. Difficult paste. Addition of processing aids.

Topic 28 - Extraction of oil. Traditional systems.

Fundamentals of partial extraction -. Characteristics of partial extraction equipment -. Factors influencing extraction -. Processing aids -. Handling partial extraction process -. Advantages and disadvantages of partial extraction system -. Pressing system. Fundamentals -. Hydraulic press description -. Operation pressing -. Factors influencing pressing -. Difficult Paste. Processing aids -. Advantages and disadvantages of the press -. Controls and regulation of the press system.

Topic 29 - Extraction of oil. Continuous systems by centrifugation.

Theoretical Foundations of centrifugation -. Centrifugal description. Operation - Factors affecting the operation - Processing aids - Advantages and disadvantages of the centrifuge system - Controls and regulation centrifuge system - System 2-phase centrifugation. - Advantages and disadvantages of centrifugation 2 phase -. Controls and regulation of 2-phase system.

Topic 30 -. Separation of liquid phases and final operations.

Separation of liquid phase by decantation. Factors -. Facilities decantation -. Separation of liquid phase by centrifugation. - Vertical Centrifuges -. Mixed system -. Conservation oil. Alterations -. Properties of stores and deposits -. Filtration of oils. Types of filters and application -. Packaging oils. Conditions and types of packaging -. Labelling.

Topic 31 -. Disposal and utilization of by-products.

The byproducts of the manufacturing process of olive oil. Quantities and characteristics - The pomace. Exploitation -. 2-phase pomace. Exploitation -. The waste water. Environmental problems -. Disposal and utilization of waste water -. Wastes the process of making olive oil.

Practical activities

Practice 1: Brewing

The practice is the development of a beer, so that will be implemented knowledge related to various operations that are common with other processed products studied in this field:

- Physical control of malta
- Grinding grain
- Enzyme activity: modulation and control
- Fermentation. Seeding and control yeast fermentation
- Filtration

Practice 2: Extraction of olive oil in pilot plant

The extraction of virgin olive oil is made by the centrifugation, assessing the influence of various factors: type of olives, addition of adjuvants and temperature. Quality parameters in oils (degree of acidity, color, sensory attributes, ...) are valued.

Methodology

GRAU EN CIÈNCIA I TECNOLOGIA D'ALIMENTS

Tipus d'activitat	Descripció	Activitat presencial alumne		Activitat no presencial alumne		Avaluació	Temps total/ECTS
		Objectius	Hores	Treball alumne	Hores		
Lliçó magistral	Classe magistral (Aula. Grup gran)	Explicació dels principals conceptes	40	Estudi: Conèixer, comprendre i sintetitzar coneixements	58	4	102/4
Problemes i casos	Classe participativa (Aula. Grup gran)	Resolució de problemes i casos	8	Aprendre a resoldre problemes i casos	8		16/0.7
Laboratori	Pràctica de Laboratori (Grup mitjà)	Execució de la pràctica: comprendre fenòmens, mesurar...	9	Estudiar i realitzar Examen	8		17/0.7
Visites	Visita a explotacions o indústries	Realització de la visita	2	Estudiar i Realitzar memòria	2		4/0.2
Activitats dirigides	Treball de l'alumne (individual o grup)	Orientar a l'alumne en el treball (en horari de tutories)	1	Realitzar un treball bibliogràfic, pràctic, etc.	10		11/0.4
Totals			60		86	4	150/6

GRAU EN ENGINYERIA AGRÀRIA I ALIMENTÀRIA

Tipus d'activitat	Descripció	Activitat presencial alumne		Activitat no presencial alumne		Avaluació	Temps total/ECTS
		Objectius	Hores	Treball alumne	Hores		
Lliçó magistral	Classe magistral (Aula. Grup gran)	Explicació dels principals conceptes	38	Estudi: Conèixer, comprendre i sintetitzar coneixements	59	6	103h/4.12
Problemes i casos	Classe participativa (Aula. Grup gran)	Aplicació dels conceptes teòrics impartits a les classes magistrals	6	Resoldre problemes i casos	12		18h/0.72
Visites a indústries	Visita a dues empreses	Conèixer in situ els processos	6		4		10h/0.4
Laboratori	Pràctiques de laboratori (grup gran)		10	Redactar memòria	15		40h/1.6
Totals			60		82	8	150h/6 ECTS

Observacions

25 hores d'activitat total per crèdit ECTS.

Evaluation

GRAU EN CIÈNCIA I TECNOLOGIA D'ALIMENTS

Tipus d'activitat	Activitat d'Avaluació		Pes qualificació
	Procediment	Número	
Lliçó magistral	Proves escrites sobre la teoria del programa de l'assignatura	2	80 (40+40)
Laboratori	L'assistència a és pràctiques obligatòria. Prova escrita sobre les pràctiques realitzades.		15
Altres	Assistència a classe, proves curtes, entrega activitats i compromís amb l'aprenentatge		5
Total			100

Observaciones

Es obligatoria la asistencia a todas las sesiones de prácticas.

A efectos de la calificación final, para superar la asignatura será necesario haber obtenido al menos un 4.5 en cada una de las pruebas escritas y un promedio de las mismas superior a 4.5 puntos.

Per aprovar l'assignatura es necessari obtenir una nota global igual o superior a 5, considerant totes les activitats avaluable amb el seu pes.

GRAU EN ENGINYERIA AGRÀRIA I ALIMENTÀRIA

Tipus d'activitat	Activitat d'Avaluació		Pes qualificació
	Procediment	Número	
Lliçó magistral	Proves escrites sobre la teoria del programa de l'assignatura	2	80 (40/40)
Problemes i casos	Entrega de resultats Proves escrites sobre problemes i casos		10
Pràctiques de laboratori	Entrega de resultats Proves escrites sobre pràctiques		5
Altres	Assistència a classe, exercicis i compromís amb l'aprenentatge		5
Total			100

Observaciones

Es obligatòria la assistència a totes les sessions de problemes i casos, visites i pràctiques.

Hi haurà dues proves escrites de teoria i una prova escrita per avaluar les pràctiques, problemes i casos. A efectes de la qualificació final, per superar l'assignatura serà necessari haver obtingut al menys un 4.5 en cada una de les proves escrites. Per aprovar l'assignatura es necessari obtenir una nota global igual o superior a 5, considerant totes les activitats avaluable amb el seu pes.

Bibliography

GRAU EN CIÈNCIA I TECNOLOGIA D'ALIMENTS

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GRAU EN ENGINYERIA AGRÀRIA I ALIMENTÀRIA

La bibliografía de las materias tecnológicas requiere una revisión continua. No obstante, se citan algunos manuales que a pesar de haber sido escritos en algunos casos hace más de una década, su contenido es adecuado para un primer contacto con el estudio de los procesos en las industrias alimentarias. Al inicio del curso los profesores proporcionaron un listado más completo de fuentes bibliográficas, incluyendo portales y direcciones de internet con

información sectorial

Bibliografía básica

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Adaptations to the methodology due to COVID-19

DEGREE OF AGRICULTURAL AND FOOD ENGINEERING

Activity types	Description	Student classroom activity		Student non-classroom activity		Assessment	Time
		Objectives	Hours	Student work	Hours	Hours	Hours/ECTS
Master lesson	Master class (Classroom. Large group)	Explanation of the main concepts	40	Study: To know, understand and synthesize knowledge	55	5	100h/4
Problems and cases	Manufacturing line dimensioning study. Consult catalogs, plans ... Innovations study.	Application of the theoretical concepts taught in the master classes	10	To solve problems and cases To study of a patent	15		25h/1
Industry visits	Canceled in person. It is replaced by viewing videos.	To know the industrial facilities	5	Analysis of videos of food manufacturing processes	10		15h/0.6
Laboratory	(Laboratory practices (large group). 50% of the practices (oils) are suspended. The procedures programmed will be explained in videoconferences with the support of videos and presentations	Brewing and analyzing each of the steps of the manufacturing process Analysis of raw materials and foods	5	Write beer brewing memory	5		10h/0.4
Totals			60		85	5	150h/6 ECTS

Observations

25 hours of total activity per ECTS credit

Adaptations to the development plan due to COVID-19

DEGREE OF AGRICULTURAL AND FOOD ENGINEERING

The classes will be taught by videoconference from the virtual campus.

Students will use the shared space of the virtual campus for the delivery of problems and assignments.

Due to the cancellation of practical classes and the suspension of visits to the industrial a collection of links to videos of the manufacturing processes described in the course will be provided.

Adaptations to the evaluation due to COVID-19

DEGREE IN FOOD AND AGRICULTURAL ENGINEERING

Given the impossibility of carrying out all the practical classes, the new distribution of the evaluable activities and the weighting is as follows:

Evaluatory activity			
Process	Number	Weighting	
Non-face-to-face written tests type test with reasoning on the subject taught in the master classes.	2	80 (40/40)	
Oral exam in the videoconference tool	1	10	
Delivery of work	1	10	
TOTAL			100

Observations

To pass the course, it will be necessary to have obtained at least 4.5 points in each of the written tests (2 of theory), and an average equal to or greater

than 5 points, considering all activities that can be evaluated with their corresponding weight