COURSE DATA

DATA SUBJECT

Code: 34111
Name: Food Industries
Cycle: Undergraduate Studies
ECTS Credits: 9
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	3	Annual

SUBJECT-MATTER

Degree	Subject-matter	Character
1103 - Degree in Food Science and Technology	Processes of the food industry	COMPULSORY

COORDINATION

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SUMMARY

"Food industries" is a mandatory subject of the third year of the Degree in Food Science and Technology, which is taught at the Faculty of Pharmacy and Food Sciences of the University of Valencia. This subject comprises a total of 9 ECTS credits and is annual.

In the current food industry there is a large number of transformation processes aimed at obtaining food products. This subject deals with the processes that are applied in the food industry, with a detailed description of the operations that can be used for the transformation, conservation and packaging of food products by specific food groups. The study of products based on cereals, milk, meat, fish, eggs, fruits, vegetables and their derivatives, as well as other relevant industries, is deepened.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

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Analyze and evaluate food safety risks.

Apply emerging technologies of food processing and preservation to develop new products with improvements in quality, costs and environmental impact.

Apply the knowledge of transformation and preservation processes to the development of new processes and products.

Conocer los mecanismos y parámetros para el control de los procesos y los equipos de la industrial alimentaria. Conocer los sistemas de control y optimización de procesos y productos aplicados a los principales tipos de industrias alimentarias.

Conocer los procesos industriales de transformación y conservación de los alimentos así como las tecnologías de envasado y almacenamiento.
Conocer los procesos de transformación y conservación particulares de los principales tipos de industrias alimentarias.

Control and optimise processes and products in the food industry.

Desarrollar nuevos procesos y productos.

Know food products derived from the application of new technologies or new nutritional knowledge, as well as their legislative framework and social impact.

Manufacture and preserve food.

DESCRIPTION OF CONTENTS

1. Introduction

1. The food industry. Definition. Types of industries. Relevance at international, state and regional level.

2. Cereals

2. Cereals: production and consumption. Grain classification. Current state of research and the industrial situation.
3. Basic concepts of cereal grain. Methods and equipment for the characterization of flours and bread

doughs. Rheological properties during kneading, fermentation and baking.
4. Products derived from cereals: Ingredients, additives and coadjuvants. Classification and effects.
5. Baking process. Stages, changes produced and equipment used.
6. Instrumental, sensory and nutritional characterization of products derived from cereals.
7. Application of cold in bakery. Frozen pre-cooked breads. Process and product quality.
8. Gluten-free products derived from cereals. Formulation, process and quality characteristics.
9. Food pasta, cookies and whipped dough. Types. Ingredients and processes.
10. Innovation in bakery products. Trends in product design.

3. Milk

11. Hygienic-sanitary quality of milk. Origin and levels of contamination. Initial and contaminating microbiota. Chemical contaminants and residues. Influence of hygiene in the milk production and marketing chain.
12. Dairy production. Milk synthesis. Factors that influence the composition of milk: extrinsic and intrinsic. Milking: good process practices.
13. Previous treatments of milk on the farm. Filtration, refrigeration and alternative methods of conservation, transport and quality control.
14. Treatments in the dairy industry. Clarification and bactofugation, skimming, standardization, homogenization, deaeration, pasteurization and sterilization. Packing. Quality control. Manufacturing defects.
15. Drinking milk. Pasteurized and sterilized milk. Shakes and flavored milks. Fortified milks. Evaporated milk. Condensed milk. Concentration procedures. Milk powder. Dehydration procedures. Quality control. Technological problems and manufacturing defects. Conservation and packaging systems.
16. Dairy derivatives. Creams and Butters. Elaboration process. Continuous manufacturing methods. Packaging and conservation. Manufacturing defects and alterations.
17. Fermented milk: Yogurt. Milk preparatory treatments. Production processes and systems. Types of yogurt. Problems in the elaboration. Quality control. BIO products and other acidophilic milks.
18. Technology of cheese making. Definitions. Milk preparatory treatments. Obtaining the curd. Syneresis. Pressing. Salty. Water activity in cheese. Control and conservation of brine. Maturation. Effects of the polluting microbiota. Toxicological problems of cheese. Additives and antifungal treatments. Packing.
19. Ice creams. Characteristics. Types of ice cream. Production processes.

4. Meat, fish and eggs

20. Meat industry: Production and consumption.
21. Classification and functional properties of muscle proteins: myofibrillar, sarcoplasmic and stromal proteins. Converting muscle to meat: Porcine stress syndrome. Maturation of meat. Factors that affect the quality of meat for direct consumption and industrialization.
22. Chemistry of curing: Ingredients, additives and coadjuvants of curing. Industrial curing processes: dry and wet. Nitrite alternatives.
23. Raw and raw marinated meat products: Fundamentals and problems of their conservation.

Characteristics of raw materials. Types of products. manufacturing operations. Alterations and defects.
24. Sausages and cooked hams: Types of products. Basic principles of the preparation of meat emulsions. Characteristics and selection of raw materials. Technological manufacturing operations. industrial systems. Alterations and defects.
25. Raw sausages and cured hams: Types of products and characteristics. Selection and control of meat and non-meat ingredients. Technological manufacturing operations. Fundamentals of sausage fermentation. Starter cultures. Changes in chemical constituents during the curing process and their influence on quality. Alterations and defects.
26. Fish and shellfish. Characteristics of technological interest. Main industrial fishing and shellfishing gear. Unit operations of fish technology. Fish cold storage.
27. Salting, pickling, drying and smoking of fish. Technological aspects of manufacturing. Characteristics of the final product. Performance. Commercialization. Fishery by-products. Surimi.
28. Eggs and egg products. Fresh egg. Treatment of fresh eggs as raw material for the production of derivatives. Liquid egg products. Frozen egg products. Dehydrated egg products.

5. Fruits, vegetables, legumes and tubers

29. Physiology and postharvest technology. Fruit and vegetable production. Respiratory metabolism, ethylene and fruit ripening. Climacteric and non-climacteric ripening. Compositional, physiological and biochemical changes during the maturation and conservation of fruits and vegetables.
30. Refrigerated preservation of fruits and vegetables. Controlled atmospheres. Cold damage and its control. Transpiration. Control of water loss in the conservation of fruits and vegetables. Physical principles. Control systems. Postharvest pathology. Main deteriorations and rottenness during the conservation of fruits and vegetables. Control systems and methods.
31. IV range products. Modified atmospheres in fruits and vegetables. Handling and conservation technologies. Microbiologic control.
32. Elaboration of canned vegetables. General description of a characteristic line of canned fruits, vegetables and legumes. New products of vegetable origin: Cold soups.
33. Elaboration of juices and nectars. Juice extraction. Juice treatments. Aseptic processing, storage and packaging systems. Examples of production lines for the main types of juices. Obtaining and conservation of semi-elaborated products: cremogenated.
34. Manufacture of jams, preserves and jellies. Production and packaging process. Examples of characteristic manufacturing lines. Additives used for the manufacture of jams and marmalades. Main defects and alterations.
35. Horchata. Raw material. Elaboration process and types. Main alterations

36. Refreshing drinks. Ingredients and types. Production processes.

37. Alcoholic beverages. Wine. Elaboration process. Types. Cider. Elaboration process. Types. Beer. Elaboration process. Types. Spirits and liqueurs. Production processes and types.

6. Other food industries

38. Oils and fats. Olive oil and oilseed oils: extraction systems. Fats of animal origin. Refining of fats and oils.
39. Stimulants: chocolate, coffee, tea. Raw Materials. Production processes. Types.
40. Industry of sugar, nougat and sweets. Raw Materials. Production processes. Additives and technologic adjuvants.

7. LAB AND PILOT PLANT PRACTICES

1.- Explanation of the equipment in the pilot plant of the IATA used for the manufacture of cereal-derived products. Preparation of manufacturing.
2.- Manufacture of bread (sliced and bar). Kneaded, division, formed, fermentation and baking. Manufacture of beaten dough.
3.- Use of different types of flour depending on final product.
4.- Preparation of fruit cremogenate; explanation of the used equipment
5.- Manufacture of refreshing drink based on dispersed fruits.
6.- Practical work related to post harvest of fruits and vegetables and visit a industry of preserving of fruit and vegetables

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	3,00
Theory	56,00
Seminar	3,00
Laboratory	25,00
Total hours	**87,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	12,00
Independent study and work	25,00
Preparation of lessons	35,00
Preparation for assessment activities	53,00
Resolution of case studies	10,00
Total hours	**135,00**

TEACHING METHODOLOGY

Theoretical classes: explanatory sessions of the contents. Classes will be taught with the help of audiovisual technical material.

Practical classes (pilot plant and industry visits): 6 sessions of practical classes will mainly be held at IATA in which students can extend and put into practice the theoretical knowledge. A practice booklet and the necessary materials will be distributed. The professor will supervise the practice, answer questions and guide the students. In addition, food industry visits could be arranged.

Tutorials: Tutorials will be held, each one hour long, in subgroups of students in order to reinforce both the theoretical and practical content of the subject.

Seminars: group work that will consist of the formulation of an experimental project related to the subject and in line with the Sustainable Development Goals (SDGs), also allowing, on a voluntary basis, its dissemination (student congress, video on YouTube, Service-Learning...). All of this within the framework of the educational innovation project ServiScience. Coordinated seminars will be held around the selected topics following the regulations for coordinated seminars available on the Degree website. The preparation of the seminar will be supervised through tutorials, which will be agreed between the professor and the students.

EVALUATION

THEORY (60%): Students will be able to choose, at the first call, between taking the entire subject in the official call or taking several partial exams at the end of each block (continuous evaluation). To pass the subject it will be necessary to obtain a grade of 5 points or higher in the official exam of the entire subject or in the simple average of all the partial exams. In the case of opting for continuous evaluation, if the minimum score is not obtained, students must take the entire subject in the second call.

PRACTICES (20%): the work done and the ability to solve experimental problems in the laboratory and pilot plant will be evaluated, as well as questions about the practices carried out in each quarter in the written theory tests described above.

TUTORIALS (10%): the ability to solve the proposed activities will be evaluated, both those of tutorials and other possible voluntary activities proposed throughout the course. Activities delivered after the deadline will not be considered.

SEMINARS (10%): the written work will be taken into account, as well as its presentation and defense in accordance with the regulations for coordinated seminars available on the Degree website. The level of understanding of the contents will be evaluated, as well as the skills for its presentation and discussion. The dissemination of the seminar will be highly valued.

To pass the subject it will be necessary to obtain a minimum of 5 points out of 10 in the theory part and that the weighted average mark of all the evaluable activities is 5 or higher.

Practice activities, tutorials and seminars are of MANDATORY ATTENDANCE and, therefore, NON-RECOVERABLE, in accordance with the provisions of article 6.5 of the UV Evaluation and Qualification Regulations for Bachelor's and Master's degrees.¿ In the event that, for justified reasons, you cannot attend any of these activities, you must notify the professor sufficiently in advance. In this way, the person in charge of the subject will determine the actions to be carried out.

Attendance at practices, tutorials and seminars is NOT mandatory for repeating students in the two years after completion, during which the grades will be kept.

Non-attendance without justified cause to the practices will imply the failure of the subject. Failure to attend coordinated tutorials or seminars without justified cause will imply a zero in the corresponding evaluation section, on the other hand, non-presentation of the coordinated seminar will imply failure of the subject, except for students who have attended and presented in previous courses.

Evidence of copying or plagiarism in any of the assessable tasks will result in failure to pass the subject and in appropriate disciplinary action being taken. Please note that, in accordance with article 13. d) of the Statute of the University Student (RD 1791/2010, of 30 December), it is the duty of students to refrain from

using or participating in dishonest means in assessment tests, assignments or university official documents. In the event of fraudulent practices, the ¿Action Protocol for fraudulent practices at the University of Valencia¿ will be applied (ACGUV 123/2020): https://www.uv.es/sgeneral/Protocols/C83sp.pdf.

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