COURSE DATA

DATA SUBJECT

Code: 33944
Name: Tecnological Bases for Foodstuffs
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1205 - Degree in Human Nutrition and Dietetics	Facultat de Farmàcia i Ciències de L'alimentació	2	First quarter
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	Facultat de Farmàcia i Ciències de L'alimentació	3	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1205 - Degree in Human Nutrition and Dietetics	Foundations of food technology	COMPULSORY
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	COMPULSORY

COORDINATION

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SUMMARY

The subject "Technological Bases of Foodstuffs" is a obligatory subject of the second year of the Degree of Human Nutrition and Dietetics and third year of Dual and Joint Degree in Pharmacy and Human Nutrition and Dietetics, which is taught in the Faculty of Pharmacy and Food Sciences, University of Valencia. This course has a total of 6 ECTS credits to be given in the first quarter.

Our main goal is for our students to acquire an overview on Food Technology and its relationship with food production, food security and the nutritional and organoleptic quality of food.

We aimed for our students to gain basic knowledge on techniques and tools that are currently being used at the food industry for production, processing, conservation and food packaging. We focus specifically on

the challenges food preservation is facing with regards to the chemical, enzymatic and microbiological changes food is prone to experience. The effects of processing, in particular the effects of the preservation methods in nutritional and organoleptic characteristics of food, are also carefully examined. In connexion with this particular topic, new technologies as an alternative to traditional methods of food preservation are also thoughtfully reviewed. These new technologies can also preserve food without significantly altering nutritional and organoleptic characteristics of food.

On the other hand, we also aimed for our students to acquire basic knowledge of technological processes that transform raw materials into food. Flow diagrams and basic operations carried out on the different food industries are analysed and studied: foods from animal origin (meat, eggs, milk, fish products, ...), foods from plant origin (cereals and baking, oils vegetable, fruit and vegetables, ...), and food and beverage fermented (alcoholic beverages, wine, beer, ...).

It is also intended that students get ideas about how to develop new products through the application of novel technologies and the use of traditional and non-traditional raw materials, such as functional foods, organic foods and GM foods.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

- It is recommended that the student present basic notions of general and organic chemistry, biochemistry, biology, and more specifically microbiology, to better understand the biochemical and microbiological processes that occur in food as well as the foundation of the techniques used in the food industry to transform raw materials into food, to develop new food or to keep them.

- It is recommended to study simultaneously with the other 2nd course subjects of the Food Science module (Bromatology and Foodstuffs Chemistry).

COMPETENCES / LEARNING OUTCOMES

1205 - Degree in Human Nutrition and Dietetics

Conocer los procesos de elaboración industrial y conservación de los alimentos.
Conocer los principales tipos de industrias alimentarias.

Desarrollar la profesión con respeto a otros profesionales de la salud, adquiriendo habilidades para trabajar en equipo.

Know, judge and know how to use and apply the sources of information related to nutrition, food, lifestyles and health.

Know about emerging technologies for the transformation and preservation of food and their impact on quality.

Know about the production systems and the basic systems for the manufacturing, transformation and preservation of the main food products.

Know the changes undergone by food as a result of technological and cooking processes.

Realizar la comunicación de manera efectiva, tanto de forma oral como escrita, con las personas, los profesionales de la salud o la industria y los medios de comunicación, sabiendo utilizar las tecnologías de la información y la comunicación especialmente las relacionadas con nutrición y hábitos de vida.

Recognise one's own limitations and the need to maintain and update professional competence, with particular emphasis on independent and lifelong learning of new facts, products and techniques in the field of nutrition and food, and on motivation for quality.

Reconocer los elementos esenciales de la profesión del dietista-nutricionista, incluyendo los principios éticos, responsabilidades legales y el ejercicio de la profesión, aplicando el principio de justicia social a la práctica profesional y desarrollándola con respeto a las personas, sus hábitos, creencias y culturas, con perspectiva de género.

DESCRIPTION OF CONTENTS

1. Introduction to food technology.

TOPIC 1. Introduction to Food Technology. What is food technology? Historical development of food technology. Objectives of food technology. Relationship of food technology with other disciplines. Food industry: current situation in Spain. Processes and unit operations. Flowcharts in the food industry.

TOPIC 2. Biochemistry and Microbiology of Foods. Chemical and microbiological food alterations. Use of enzymes in the food industry. Fermentation: lactic, alcoholic, malolactic, propionic and acetic. Other processes controlled by microorganisms. Starter cultures in the production of fermented foods and beverages.

2. Operations of food industry.

TOPIC 3. Processing operations in the food industry. Changes in volume. Mixtures and moulding. Texture modifications. Chemical and enzymatic treatments. Separation. Other processing operations.

TOPIC 4. Food preservation by heat. Thermal resistance of microorganisms and proteins. Factors influencing the heat treatment of food. Heat conservation techniques. Effect of heat on food.

TOPIC 5. Food preservation by cold. Cooling and freezing. Relationship with spoilage agents. Cooling and freezing systems. Storing and thawing.

TOPIC 6. Food preservation by depression of the water activity. Water activity and microbial growth. Evaporation. Dehydration. Reconstitution of dehydrated foods.

TOPIC 7. Other methods of preservation. Acidity in the conservation. Modified atmospheres. High hydrostatic pressures. Food irradiation. Other techniques.

TOPIC 8. Packaging and storage. Types of packaging. Active and intelligent packaging. Storage.

3. Processing of animal products.

TOPIC 9. Meat and meat products. Meat processing. Slaughterhouses. Meat preparations. Cured meat products. Process technology. Other meat products.

TOPIC 10. Fish and fishery products. Fresh fish: processing and conservation. Fishery products. Shellfish. Fishery byproducts.

TOPIC 11. Eggs and egg products.Processing from start to market. Alteration and preservation of eggs. Egg products.

TOPIC 12. Milk and dairy products. Processing of milk. Heat treatments. Drinking milk. Fermented milks, yogurt, kefir and cheese. Dairy products: butter, cream and ice cream.

4. Processing of food from vegetable origin.

TOPIC 13. Food oils and fats. Industrial preparation of vegetable oils. The specific case of animal fats and oils. Refining.

TOPIC 14. Cereals and derivatives. Cereals. Wheat processing. Grinding industry: flours and semolina. Baking process. Preparation of pasta, cookies, pastries, cakes and breakfast cereals.

TOPIC 15. Fruits, vegetables and their derivatives. Post-harvest technology. Preservation of fruits and vegetables. Fruit and vegetable juices. Canned vegetables. Jams and jellies.

5. Processing of special food and beverages.

TOPIC 16. Alcoholic beverages. Alcoholic fermentation. Wine and wine making. Technology of beer production. The alcoholic distillates.

TOPIC 17. Functional, organic and GM foods. Functional foods: definitions and types. Organic food: assessment and marketing. Genetically engineered foods: definition, types and evaluation.

6. Practices

1. Heat sterilization of canned food.

2. Production of frozen products.
3. Fruit jam elaboration.
4. Extraction, pasteurization and concentration of juices.
5. Dehydration of foods: spray and freeze drying.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	2,00
Theory	38,00
Seminar	2,00
Laboratory	15,00
Total hours	**57,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	10,00
Independent study and work	15,00
Preparation of lessons	25,00
Preparation for assessment activities	30,00
Resolution of case studies	10,00
Total hours	**90,00**

TEACHING METHODOLOGY

Method	Hours
Seminars	2
Theory	38
Practice	15
Tutoring	2

Teaching is based on the individual study of the topics above that will be reinforced with the organization of **tutoring**. Prior to the date of tutoring, the student must have prepared the proposed activities to reinforce the learning of specific aspects of the program. **Classes** are taught using audio-visual technical equipment. The student will have this material in the virtual classroom.

The labs are raised in a pilot plant in which students can relate to certain industrial techniques as making

preserves, freeze-dried products, frostbite, which favors the relationship between knowledge and its application to practice. Be provided a booklet prior to procedures, as well as a number of issues and problems that students must meet and provide the teacher within a certain time.

Coordinated seminars will be held on topics proposed by the teacher and related to the subject, following the guidelines on coordinated seminars available on the Degree website. The preparation of the seminar will be supervised through tutorials, which will be agreed between the teacher and the students. The works will be presented in writing and will be exhibited in public, attendance being mandatory for the rest of the students enrolled in the subject. In the case of the Double Degree in Pharmacy and NHD, the seminars will not be coordinated, and they are also mandatory for all the students.

During the classes, application examples of the subject contents in relation to the **Sustainable Development Goals (SDG)** will be indicated, as well as, in the topic proposals for coordinated seminars. Thereby, it is intended to provide students with knowledge, skills, and motivation to understand and address these SDGs.

EVALUATION

The acquisition of knowledge, abilities and skills will be assessed throughout the following evaluable tests.

1) **Written tests.** Make a written test to ensure knowledge and understanding of theoretical minimum content established for the subject (60%). In the case of the students of the Double Degree in Pharmacy and NHD that do not realize the seminar, the written test is worth 70%.

2) **Lab sessions and practices**. Evaluation of laboratory work by monitoring the work of the same, the ability to solve experimental problems encountered and the ability to make very detailed and organized reports of experimental results. The written test will include questions about practical contents (20%). The qualification obtained will be multiplied by a coefficient between 0.5 and 1, to be considered by the teaching staff, depending on the attitude, participation in the laboratory and punctuality shown by the student.

3) **Seminars**. The following items will be taken into account for their assessment: written work, level of understanding of the contents, as well as the skills for its exposition, defense and discussion (10%), according to the guidelines on coordinated seminars available at the web page of the Degree. In the evaluation of the not coordinated seminars in the Double Degree in Pharmacy and NHD the exposure, defense and discussion of the work will be valued and will also represent a 10% of the total evaluation.

4) **Tutorials.** Evaluation of the work during the tutorials, the ability to solve the proposed activities and the level of involvement (10%).

It is necessary to acquire 4.5 points out of 10 in the written test, which includes theory and practice questions, in order to mediate with the rest of the evaluable activities.

To pass the subject, it is necessary to obtain at least 5 points out of 10 in the weighted average of the total

of the evaluable activities. The final grade of the subject may be increased by up to 0.5 points with the evaluation of activities carried out during the hours of theoretical classes.

To obtain the distinction of honours, it is a preferential criterion to pass the subject in its first call.

The activities of practices, tutorials and seminars are of MANDATORY ATTENDANCE to pass the subject, and therefore, they are NOT RECOVERABLE, in accordance with the provisions of article 6.5 of the Evaluation and Qualification Regulations of the UV for Bachelor's and Master's degrees." In the event that, for justified reasons, it is not possible to attend any of these activities, you must communicate well in advance. In this way, the person in charge of the subject will determine the actions to be carried out. Possible *changes between groups of practices, tutorials and seminars, will only be allowed for justified reasons, upon receipt of the corresponding supporting document, no later than 15 days before the start of the activity.*

Attendance at practices, tutorials and seminars is NOT MANDATORY for repeating students during the two subsequent courses to its realization. During this time the califications will be preserved.

Non-attendance without justified cause in the tutorials or coordinated seminars 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 years.

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.

REFERENCES

References considered basic to the subject are marked in bold.

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