

28951 - Processing technologies in the food industries

Syllabus Information

Academic year: 2024/25

Subject: 28951 - Processing technologies in the food industries

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 583 - Degree in Rural and Agri-Food Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Optional

Module:

1. General information

This subject provides the necessary knowledge to be able to evaluate the quality of raw materials, as well as their suitability to produce products of animal and vegetable origin. You will learn about all aspects involved in the handling, preparation, transformation and preservation of the different products as well as the equipment necessary to carry out these processes.

These approaches and objectives are aligned with some of the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), specifically, the learning activities planned in this subject will contribute to the achievement of target 9.4 of Goal 9, and target 12.3 of Goal 12.

2. Learning results

To know, understand and use the principles of food technology and food analysis for its application in the processing and quality evaluation of foods of both plant and animal origin.

To know and know how to apply the different methods of obtaining, processing and preservation of products of animal (meat, milk, fish and eggs) and plant origin minimizing the appearance of alterations and defects to obtain high quality products.

To develop the necessary skills for the formulation and processing of foods from both animal and vegetable origin.

To elaborate results obtained from the observation and measurement of physical and chemical properties and their changes during the processing of foods of both plant and animal origin.

To understand the operation and select the necessary equipment to design the processing lines of the different food industries for the elaboration of animal and plant food.

Value the important role of Food Science and Technology in the elaboration and preservation of agri-food products.

Learning results 1, 4, and 6 align with the SDGs, in particular with target 12.3 and goals 2, 3, and 5 with target 9.4.

3. Syllabus

DIDACTIC UNIT 1. INTRODUCTION

Topic 1. Introduction to the subject Technology of the Agro-Alimentary Industries

DIDACTIC UNIT 2. MEAT AND MEAT PRODUCT TECHNOLOGY

Topic 2. Introduction

Topic 3. Transformation of muscle into meat

Topic 4. Meat quality

Topic 5. Fresh meat technology

Topic 6. Meat by-products: classification and main technological processes

Topic 7. Technology for meat preparations and minced raw meat products

Topic 8. Technology of whole raw meat products

Topic 9. Technology of heat-treated meat products

DIDACTIC UNIT 3. FISH AND FISH PRODUCTS TECHNOLOGY

Topic 11. Fish technology

Topic 12. Fish products technology

DIDACTIC UNIT 4. MILK AND DAIRY PRODUCTS TECHNOLOGY

- Topic 13. Introduction to the dairy sector
- Topic 14. Composition and physicochemical structure of milk
- Topic 15. Physical, physicochemical and organoleptic properties of milk. Hygienic quality of milk
- Topic 16. Milk collection, cooling and pre-heat treatment operations
- Topic 17. Drinking milks: pasteurized milk and sterilized milk
- Topic 18. Concentrated milks
- Topic 19. Fermented milks: yoghurt and other fermented milks
- Topic 20. Cream and butter
- Topic 21. Cheese

DIDACTIC UNIT 5. EGG AND EGG PRODUCT TECHNOLOGY

- Topic 22. Egg and egg products

DIDACTIC UNIT 6. HORTO-FRUIT PRODUCTS TECHNOLOGY AND DERIVED PRODUCTS

- Topic 23. Introduction to the fruit and vegetable sector
- Topic 24. Characteristics and preservation of fresh fruits and vegetables
- Topic 25. Minimally processed products and fifth-range products
- Topic 26. Canned, frozen and dehydrated fruit and vegetable products
- Topic 27. Juice and cremogenate processing
- Topic 28. Flour and bread processing
- Topic 29. Olive and olive oil processing

4. Academic activities

Lectures: 30 hours

Theoretical sessions where the contents of the subject will be explained

Laboratory practices: 10 hours

Practical laboratory sessions (quality parameters of different foods and the factors that influence their elaboration process and quality).

Special practices (visits to companies in the agri-food sector): 10 hours

These activities are subject to the budget available for their implementation

Problem solving and case studies: 10 hours

Methods used for the production of a given food, formulation, equipment and legal requirements.

All activities are aligned with SDGs 12 and 9, in particular target 12.3 and target 9.4.

5. Assessment system

The subject will be evaluated in the **continuous assessment** mode by means of the following activities:

- **Intermediate tests** (65% of the grade, minimum 5 out of 10).

They will consist of two individual theoretical-practical written tests throughout the semester. The tests will consist of 5 short questions and 10 simple answer test questions and 1 theoretical-practical case. The multiple-choice questions will be of simple answer. In the short answer questions, the correctness and synthesis capacity in the answer will be valued.

In the qualification of the theoretical-practical assumptions will be valued the correctness of the approach, the results obtained as well as the order, presentation and interpretation of the same.

- **Laboratory practices and visits** (15% of the grade, minimum 5 out of 10).

There will be several laboratory practices distributed throughout the semester. The following aspects will be evaluated:

- Handling of laboratory material and techniques and solutions provided to the problems encountered.

- Report made at the end of each practice.

- Student autonomy and participation.

In the case of visits, the student's participation and the resolution of a questionnaire related to the company visited will be valued.

- **Project** (20 % of the grade, minimum 5 out of 10)

During the problem solving and case studies sessions, a team work will be proposed to be developed throughout the subject in classroom sessions and in the Pilot Plant, consisting of the elaboration of a foodstuff to be presented in writing and orally. The following aspects will be evaluated: preparation of the conservation strategy and analysis of quality, formal aspects of presentation (order, clarity, correct use of bibliographic sources), adequate presentation and defense of the results.

If the student has not passed any of these activities during the semester, they will have the opportunity to pass the course by means of a global test in two the subject by means of a **global test** in the two official calls.

The global test will consist of a written exam including 20 multiple-choice questions, 10 short questions and 2 theoretical and

practical assumptions on the contents covered in the theoretical and practical sessions of the subject and its weight on the overall grade will be of 80% (65% theoretical questions and 15% practical questions) and a second activity which will be the delivery and defense of the work (20% of the overall grade).

All planned activities contribute to the assessment of the two SDGs that define the subject, target 9.4 and 12.4. Both goals are totally or partially evaluated in all the programmed assessment activities and contribute to the overall grade of 25% for the theoretical tests, 10% for the practical assessment and 10% for the tutored work.

The success rate of the subject in the last 3 years has been 100%. There were no students enrolled in the 2020-21 and 2022-23 academic years.

6. Sustainable Development Goals

9 - Industry, Innovation and Infrastructure

12 - Responsible Production and Consumption