

## 30818 - Basic operations in the food industry

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 30818 - Basic operations in the food industry

**Faculty / School:** 105 - Facultad de Veterinaria

**Degree:** 568 - Degree in Food Science and Technology

**ECTS:** 6.0

**Year:** 2

**Semester:** Second semester

**Subject type:** Compulsory

**Module:**

### 1. General information

One of the specific objectives of the Degree in Food Science and Technology is to train qualified professionals in food processing and process development and innovation. Taking into account this professional profile, the objective of the subject is that students acquire the fundamental knowledge of the basic operations of the food industry and the engineering principles necessary to apply this knowledge to specific cases of food processing ; and thus, that the student is able to characterize the parameters that define a basic operation, quantify and relate them.

This is closely related to the subject Fundamentals of Chemical Engineering, in which the student acquires the basic concepts of chemical engineering applicable to food science and technology .

The contribution of this subject to the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 are: Goal 3, objective 3.4; Goal 4, objective 4.4; Goal 7, objective 7.3; Goal 9, objective 9.4., Goal 12, objective 12.3

### 2. Learning results

The student must demonstrate that:

1. Is able to analyse the most important unit operations in the food industry using simple physical models that reproduce the action of the operation
2. Is able to choose the most appropriate basic operation(s) for the preparation, procurement, preservation and processing of food
3. Is able to evaluate how and on what the parameters that characterize the main basic operations of the food industry exert their influence.
4. Is able to solve basic calculation problems to determine the operating variables of the industrial processing of a food
5. Is able to analyse the advantages, disadvantages and limitations of the equipment and facilities used to perform the main basic operations in the food industry the main basic operations in the food industry.

### 3. Syllabus

#### BLOCK I. INTRODUCTION

Topic 1. Fundamental concepts

#### BLOCK II. BASIC TRANSACTIONS OF MOVEMENT QUANTITY TRANSPORT

Topic 2. Sedimentation and centrifugation

Topic 3. Fluidization

Topic 4. Filtration

Topic 5. Membrane operations

#### BLOCK III. BASIC HEAT TRANSFER OPERATIONS

Topic 6. Evaporation

Topic 7. Heating and cooling

Topic 8. Refrigeration and freezing

#### BLOCK IV. BASIC MATTER TRANSFER OPERATIONS

Topic 9. Distillation

Topic 10. Leaching

#### BLOCK V. BASIC OPERATIONS OF HEAT TRANSFER AND MATTER TRANSFER

#### 4. Academic activities

- Participative master classes: 26 hours to deal with the theoretical contents and 18 hours for the resolution of questions and problems posed.
- Seminars: 6 hours distributed in two sessions of 3 hours each for the resolution, commentary and sharing of the cases presented.
- Laboratory and pilot plant practices: 10 hours distributed in five sessions of 2 hours each.
- Study and personal work: 86 hours.
- Assessment tests. 4 hours.

#### 5. Assessment system

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

- Evaluation test of Blocks 1 and 2 (30% of the grade).
- Evaluation test of Blocks 3, 4 and 5 (45% of the grade).

Both tests will consist of short and/or multiple-choice questions on theoretical aspects and problem solving.

-Work on practices and seminars (25% of the grade).

Each evaluation activity will be graded from 0 to 10. In order to pass the continuous evaluation, a minimum final grade of 5 must be obtained and, in addition, the grade for each of the three evaluation activities must be at least 4.

If the student has not passed any of these activities during the semester, they will have the opportunity to pass the subject by means of a global test (100% of the final grade, minimum 5 out of 10) in the two official calls. The global test will consist of short and/or multiple-choice questions (50% of the grade) and the resolution of 1 or 2 calculation problems ( 50% of the grade).

Both in the continuous evaluation tests and in the global test, the following will be assessed:

- the degree of knowledge of the subject matter
- the ability to interrelate different concepts and coherence in reasoning
- clarity of exposition and capacity for synthesis.
- the skill in the search for physical and chemical properties
- unit management
- the approach, resolution and accuracy in the calculation of the problems
- the ability to draw conclusions from the results of practices and to extrapolate them to other cases

#### 6. Sustainable Development Goals

- 7 - Affordable and Clean Energy
- 9 - Industry, Innovation and Infrastructure
- 12 - Responsible Production and Consumption