

## 30815 - Chemical analysis of food

### Syllabus Information

**Academic year:** 2023/24

**Subject:** 30815 - Chemical analysis of food

**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

The objective of this subject is for the student to understand the principles on which the analytical chemical techniques related to food are based, acquire the ability to select the appropriate analytical chemical technique when faced with a practical problem, and acquire the practical skills in the laboratory of chemical analysis of food.

These approaches and objectives are aligned with some Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of learning results of the subject provides training and competence to contribute to some extent to their achievement. These goals are: Goal 4 (Quality education), Goal 9 (Industry, innovation and infrastructure) and Goal 12 (Responsible production and consumption).

### 2. Learning results

1. Understands the fundamentals of food chemical analysis as well as the basics of electrophoretic, immunochemical, enzymatic and genetic techniques and their application in process and product control.
2. Is able to select the most appropriate analytical procedure for the determination of an analyte in a food depending on its matrix and concentration and the processing to which it has been subjected.
3. Is able to interpret data and graphs derived from chemical, electrophoretic, immunochemical, enzymatic and genetic analysis in Spanish and English, and solve computational problems derived from them.
4. Is able to interpret each of the steps involved in an analytical procedure.
5. Is able to perform and reason the calculations involved in establishing the final concentration of the analyte.
6. Is capable of elaborating a project, working in a team, detailing the chemical analyses that should be carried out on a given raw material according to legal, technological and commercial criteria.

### 3. Syllabus

#### **BLOCK I. INTRODUCTION**

Topic 1: Introduction

Topic 2: Sample collection and preparation

#### **BLOCK II. ANALYSIS OF FOOD COMPONENTS**

Topic 3: Moisture and ash determination

Topic 4: Lipid analysis

Topic 5: Carbohydrate analysis

Topic 6: Analysis of proteins and other nitrogen compounds

Topic 7: Determination of vitamins and inorganic elements

#### **BLOCK III. SPECIAL TECHNIQUES FOR FOOD ANALYSIS**

Topic 8: Immunochemical techniques: fundamentals and applications

Topic 9: Genetic techniques: fundamentals and applications

Topic 10: Electrophoretic techniques: fundamentals and applications

#### 4. Academic activities

- Participative master class: 28 hours

The contents of the subject will be presented, with a practical orientation to food quality control.

- Problem solving and case studies: 6 hours

Problems will be solved and practical cases will be presented that require the application of different techniques.

- Laboratory practices: 20 hours

Different components as well as the effect of processing will be determined using different techniques

External visits to food control centres: 6 hours

- Teaching assignments:

It includes a group teaching work that is presented in written and oral form, as well as a laboratory practice report that is presented individually.

#### 5. Assessment system

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

##### **Written test of theoretical teaching (60% of the grade, minimum 5 out of 10)**

It will consist of 8 long answer questions and a problem or case study.

The adequacy of the answer to the question, the capacity of synthesis, clarity and coherence in the reasoning will be valued

##### **Assessment of practical teaching (20% of the grade, minimum 5 out of 10)**

Several laboratory practices will be carried out. The following aspects will be assessed:

Laboratory skills and abilities

Deepening in practice

Student autonomy and participation

Report on a practice

There will be a team work on **the chemical analysis of a food (20% of the grade, minimum 5 out of 10)**. Consideration will be given to the selection of the parameters to be determined, the adequacy of the analyses required for the food, the review of criteria and legal regulations, the clarity and order of the presentation both in written and oral form, as well as the answers to the questions raised in the oral presentation.

In relation to teamwork, those students who do not pass it in advance, have not chosen this modality or want to raise their grade, will be evaluated on the official dates indicated by the Center by means of an individual evaluation test consisting of a written and oral presentation of a paper on the same topic or on another previously agreed with the teacher.

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**, which will consist of the same activities as in the continuous evaluation, in the two official calls for exams.