1. OVERVIEW

Subject Area	Bromatology
Degree	Bachelor's Degree in Human Nutrition and Dietetics
School/Faculty	Biomedical and Health Sciences
Year	First
ECTS	6 ECTS
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On-campus and blended
Semester	Second
Coordinating professor	Dr Clara Colina Coca

2. INTRODUCTION

Bromatology is part of the overall subject of Food Science and Technology in Module 2 (Food Science) The subject area of Bromatology, worth 6 ECTS credits, is delivered in the second semester of the first year of the degree in Human Nutrition and Dietetics.
The overall objective of this subject area is to study the nature, composition, modification and processing of food. The knowledge and skills acquired will provide students with the foundations required to carry out subsequent studies with a high level of autonomy.
Students will begin the subject area by classifying foods and identifying the different food groups, as well as the different food products derived from them in accordance with current legislation. Following this, students will study the physical, chemical and nutritional characteristics and properties of foods, as well as their organoleptic and sensory properties. They will also study the possible modifications that foodstuffs undergo during the processes of ripening, preparation, production, etc., engaging in in-depth study of the preventive measures needed to avoid food spoilage and guarantee food safety.

3. SKILLS AND LEARNING OUTCOMES

Key skills (CB, by the acronym in Spanish):

- CB2: Students can apply their knowledge to their work professionally and possess the necessary skills, usually demonstrated by forming and defending opinions, as well as resolving problems within their study area.

- CB3: Students have the ability to gather and interpret relevant data (usually within their study area) to form opinions which include reflecting on relevant social, scientific or ethical matters.
- CB4: Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

General skills (CG, by the acronym in Spanish):

- CG7: Be able to write reports and complete records related to the professional activity of dieticians/nutritionists.
- C8: Identify and classify foods and food products. Know how to analyse and determine their composition, properties, nutritional value, the bioavailability of their nutrients, organoleptic properties and the modifications they undergo as a result of technological processes.
- CG9: Be familiar with the basic processes involved in the production, processing and preservation of both animal and plant-based foods.

Cross-curricular skills (CT, by the acronym in Spanish):

- CT1: Communication: ability to engage in active listening, ask questions and respond in a clear and concise way, as well as to effectively express ideas and concepts. This includes concise and clear written communication.
- CT3: Teamwork: Ability to integrate and collaborate actively with other people, areas and/or organisations to reach common goals.
- CT7: Decision making: ability to choose between different options or methods to effectively solve different problems or situations.
- CT9: Ability to put knowledge into practice, using the skills acquired in the classroom to mock situations based on real life experiences that occur in the relevant profession.

Specific skills (CE, by the acronym in Spanish):

- CE41: Understand the concept of food and its classification.
- CE42: Know the composition and characteristics of the different food groups.
- CE43: Be familiar with Spanish legislation and EU directives related to food.
- CE44: Know the physical, chemical and microbiological modifications of food.
- CE45: Be familiar with food-related infections and poisoning, as well as the general principles of food preservation: physical and chemical methods.
- CE46: Know the concepts of food safety and quality control.

Learning outcomes (RA, by the acronym in Spanish):

- RA1: Be able to identify and classify foods, food products and ingredients.
- RA2: Know the chemical composition of foodstuffs, their physical and chemical properties, their nutritional value and bioavailability.
- RA3: Know and apply the fundamentals of bromatological and sensory analysis of food products.
- RA4: Understand the processes and mechanisms that cause food spoilage and how this can be prevented.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CB2, CB3, CB4,CG7, CG8,CT1, CT7, CT9, CE41, CE43	**RA1**: Be able to identify and classify foods, food products and ingredients.
CB2, CB3, CB4,CG7,CG8,CT1, CT3, CT9, CE42	**RA2**: Know the chemical composition of foodstuffs, their physical and chemical properties, their nutritional value and bioavailability.
CB2, CB3, CB4, CG8, CG9, CT1, CT3, CT7, CT9, CE44	**RA3**: Know and apply the fundamentals of bromatological and sensory analysis of food products.
CB2, CB3, CB4,CG7,CG8,CG9,CT1, CT3, CT7, CT9, CE44, CE45, CE46	**RA4**: Understand the processes and mechanisms that cause food spoilage and how this can be prevented.

4. CONTENTS

This subject area is divided into seven learning units, which are then divided into various topics.
The contents are detailed below. These contents will serve as the basis for subject areas later on in the degree, such as Food Technology, Nutrition and Dietetics, etc.

Unit 1. Introduction to Bromatology. Objective:
Basic concepts of Bromatology.

- Topic 1. Introduction to Bromatology.

Unit 2. Plant-based food.

Objective: Classify and assess the differences between different plant-based foods.

- Topic 2. Legumes.
- Topic 3. Fruit and vegetables.
- Topic 4. Cereals.

Unit 3. Animal-based food.

Objective: Classify and assess the differences between different animal-based foods.

- Topic 5. Dairy.
- Topic 6. Eggs.
- Topic 7. Meat.
- Topic 8. Fish.

Unit 4. Other foodstuffs.

Objective: Classify and evaluate other animal and plant-based foods.

- Topic 9. Other foodstuffs.

Unit 5. Food stability.

Objective: Requirements for greater food stability.

- Topic 10. Physical, chemical and microbiological modifications of food. Food preservation: physical and chemical methods.

Unit 6. Food toxicology.

Objective: Toxic components in food and toxicological evaluation.

- Topic 11. Food toxicology.
- Topic 12. Food additives.

Unit 7. Food analysis and control.

Objective: Bromatological analysis and food quality control.

- Topic 13. Main food analysis techniques.
- Topic 14. Food safety and quality control

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Lecture
- Case studies
- Collaborative learning
- Problem-based learning
- Simulated environments
- Spoken presentations by students

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours
Lecture	30
Independent working	25
Case studies	20
Debates and discussions	12
Spoken presentations by students	10
Written reports and essays	8
Lab work	18
Tutorials	20
Knowledge test	7
TOTAL	**150**

Blended learning

Learning activity	Number of hours
Reading of content	15
Online seminars	15
Independent working	25
Lab work	18
Online tutorials	20
Debates and discussions	12
Spoken presentations by students	10
Case studies	20
Written reports and essays	8
Knowledge test	7
TOTAL	**150**

7. ASSESSMENT

The assessment methods, together with their respective weighting towards the final grade for the subject, are as follows:

On campus:

Assessment method	Weighting
Knowledge test	40%
Laboratory work	15%
Analysis of case studies and problem-solving	25%
Spoken presentation	5%
Submission of reports	10%
Participation in debates	5%

Blended:

Assessment method	Weighting
Knowledge test	40%
Laboratory work	20%
Analysis of case studies and problem-solving	20%
Spoken presentation	5%

Submission of reports	10%
Participation in debates	5%

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment activities, including the deadlines and assessment procedures for each activity.

8. BIBLIOGRAPHY

The reference work for following this subject area is:

- Alimentos: Composición y Propiedades. Astiasarán, I.y Martínez, J. A. 2ª edición.Ed. McGraw-Hill, Interamericana de España. Madrid, 2010.
- Bromatología: composición y propiedades de los alimentos. Mendoza Martínez, E. y Calvo Carrillo, M. C. Ed. McGraw-Hill Interamericana. 2010.
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- Química de los Alimentos. Belitz, H.D. y Grosch, W. 2ª edición. Ed. Acribia. Zaragoza, 2011.
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