

**COURSE DATA****Data Subject**

<b>Code</b>	33942
<b>Name</b>	Bromatology
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	10.5
<b>Academic year</b>	2021 - 2022

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1205 - Degree in Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	2	Annual
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	Faculty of Pharmacy and Food Sciences	3	Annual

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1205 - Degree in Human Nutrition and Dietetics	10 - Bromatology	Obligatory
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	1 - Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	Obligatory

**Coordination**

<b>Name</b>	<b>Department</b>
ALEGRIA TORAN, AMPARO ASUNCION	265 - Prev. Medicine, Public Health, Food Sc.,Toxic. and For. Med.
CILLA TATAY, ANTONIO	265 - Prev. Medicine, Public Health, Food Sc.,Toxic. and For. Med.
MECA DE CARO, GIUSEPPE	265 - Prev. Medicine, Public Health, Food Sc.,Toxic. and For. Med.



## SUMMARY

Basic concepts related to: a) Terminology of the subject: food chemistry, food, feeding, b) Functional foods c) Quality of foods.

Study of the different food groups (animal and plant origin, beverages and others) regarding the following aspects: composition, properties and quality parameters.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

Mainly basic module subjects biology, general chemistry and organic.

To enrol simultaneously other subject of module of Food Sciences such as Food Chemistry and Food Technology.

## COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

### 1205 - Degree in Human Nutrition and Dietetics

- 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.
- Know, judge and know how to use and apply the sources of information related to nutrition, food, lifestyles and health.
- Desarrollar la profesión con respeto a otros profesionales de la salud, adquiriendo habilidades para trabajar en equipo.
- 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.
- 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.



- Identify and classify food and food products. Know how to analyse them and determine their composition, properties, nutritional value, bioavailability, organoleptic and sensorial characteristics and alternations resulting from technological and culinary processing.
- Interpretar y manejar las tablas y bases de datos de composición de alimentos.
- Adquirir la formación básica para la actividad investigadora, siendo capaces de formular hipótesis, recoger e interpretar la información para la resolución de problemas siguiendo el método científico, y comprendiendo la importancia y las limitaciones del pensamiento científico en materia sanitaria y nutricional.
- Interpretar los informes y expedientes administrativos en relación a un producto alimentario e ingredientes.
- Be familiar with discipline-specific terminology.
- Acquire capacity to assess the impact of the consumption of food on the health of the population.
- Know the general and specific parameters of quality for each food group.

### **LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)**

- Familiarization with and correct use of the terminology of the subject.
- Capacity to compare composition and properties (nutritional, technological and beneficial) of the different food groups, using the food composition tables and databases.
- Nutritional evaluation of any food, based on its composition or general or nutritional labeling, allowing integration within the food-health binomial.
- Knowledge of when, where and how to control food quality.
- Knowledge and capacity to use the basic and specialized literature sources, as well as some electronic sources addressing topics related to Bromatology.
- Capacity to adequately synthesize and organize information from different sources.
- Capacity to correctly express the knowledge gained and relate it to previously acquired data.
- Acquisition of a critical and creative approach (initiative and autonomy), combined with scientific rigor, to evaluate and resolve problems.
- Cooperation in the context of teamwork, for the exchanging of experiences.
- Capacity to apply / develop the acquired knowledge and skills with a personal perspective promoting the development of human rights.



## DESCRIPTION OF CONTENTS

### 1. General

Subject 1. Food Science. Concept. Academic guidelines.  
Subject 2. Food definition. Food classification.  
Subject 3. Books and food composition data bases. Food analysis.  
Subject 4. Functional foods.  
Subject 5. Quality of foods. Criteria of quality. Typology (health, sensorial, nutritional and technological).  
Subject 6. Food information: food labeling.

### 2. Animal foods

Subject 7. Meat and meats products. Classification. Composition and nutritional value. Animal fats. Characteristics of quality.  
Subject 8. Fish, products of the fish and derivatives. Classification. Composition and nutritional value. Characteristics of quality.  
Subject 9. Eggs and derivatives. Composition and nutritional value. Characteristics of quality.  
Subject 10. Milk and dairy products. Classification. Composition and nutritional value. Characteristics of quality.

### 3. Vegetable foods

Subject 11. Fats of vegetal origin. Modified fats. Fat substitutes. Quality parameters.  
Subject 12. Cereals and derivatives. Classifications. Pseudocereals. Wheat and rice: structure and grain composition. Flour: composition. Bread. Bakery products. Composition and nutritional value. Breakfast cereals. Quality parameters.  
Subject 13. Vegetables. Classification. Composition and nutritional value. Criteria of quality-  
Subject 14. Tubercles. Composition and nutritional value.  
Subject 15. Vegetables and derivatives. Classification. Composition and nutritional value. Commercial presentations. Criteria of quality.  
Subject 16. Fruits and derivatives. Classification. Composition and nutritional value. Commercial presentations. Criteria of quality. Dried fruits and nuts.

### 4. Beverages

Subject 17. Water. Potable water. Packaged drink waters. Parameters of quality.  
Subject 18. Alcoholic beverages. Classification. Fermented beverages. Distilled beverages. Composition and nutritional value.  
Subject 19. Non- Alcoholic beverages. Classification. Composition and nutritional value.

**5. Others**

Subject 20. Coffee, tea, cocoa and derivatives. Composition and nutritional value.

Subject 21. Natural sweeteners: Sugar and honey. Confectionery products. Composition and nutritional value. Parameters of quality

Subject 22. Condiments and spices. Classification. Salt and vinegar. Spices.

**6. Laboratory and informatics sessions**

Laboratory sessions (4h/session)

1 Oils: Degree of acidity, peroxide index, UV absorption

2 Fruit juices : vitamin C, density and Brix degrees.

Milk: Dry extract, ashes, humidity.

3 Vegetable canned foods: Net and slipped weight, pH, acidity, chlorides

4 Coffee: caffeine determination.

Non-alcoholic beverages: Quinine determination

5 Eggs: Traceability. Quality parameters. Cholesterol determination

Two informatic sessions (2x 2,5 h): Foods comparisons: Composition and nutritional values. Uses of printed and on-line food composition databases and food labeling.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	65,00	100
Laboratory practices	25,00	100
Seminars	5,00	100
Tutorials	4,00	100
Development of group work	25,00	0
Study and independent work	100,00	0
Preparation of evaluation activities	20,00	0
Preparation of practical classes and problem	12,50	0
<b>TOTAL</b>	<b>256,50</b>	

**TEACHING METHODOLOGY**

**Theoretical classes:** 65 hours / course. The classes are imparted with the support of technical audiovisual material. This material will be previously made available to the student through the virtual platform. At the end of each thematic block, the teacher will be able to use TIC tools to achieve the most relevant concepts. It will be contemplated to relate the issues with aspects of the Sustainable Development Goals (SDG) more related to the matter.





**Seminars:** Five seminars, four coordinated, on topics provided by the teacher or proposed by the students and related to the subject (some of them related to the SDGs most aligned with the subject). The seminars will be supervised through tutorships, arranged between the teacher and students. The seminars will be developed in writing and will be presented by the students. Following the verbal presentation, the rest of the students will have the opportunity to intervene, moderated by the teacher. It will follow the guidelines on coordinated seminars available at the web page of the Faculty.

In the case of Double Degree (Pharmacy and HND) the seminars will not be coordinated.

**Practical classes (laboratory and software):** 25 hours/course. Five practical laboratory classes with duration of four hours, and two computer room sessions with duration of two hours and a half. The teacher will previously distribute a booklet with the procedures, which will be available through the virtual platform.

The students will have to elaborate a memorandum, in the format that will facilitate him previously, of each of the practices of laboratory that it will include: objective, sample description, experimental data, calculation, interpretation of results and references used. They must elaborate and deliver the corresponding memorandum on having finished every practice.

In the case of the two practical computer sessions, the students will carry out a work involving comparison of the composition and nutritional value of specifically prepared dishes or foods, to be presented in writing. The memoranda are to be presented during the one week following conclusion of the practical classes. At the end of the last computer session there will be a written evaluation test of the practical classes as part of the continuous evaluation.

**Tutoring:** Four tutorships are contemplated, each with duration of one hour, per group of students. The students will establish the doubts on the subject, with short questions and/or previously supplied problems through the virtual platform.

## EVALUATION

**1.- Theoretical and practice written exam:** The exam material will include the subjects presented during the theoretical classes and laboratory and computer room sessions, involving open and short questions or alternative response questions (true-false), with due reasoning, type test, and short questions and the numerical solving of practical cases. In the case of the Double Degree (Pharmacy and HND) it will be possible to include questions related to topics covered in the seminars.

Continuous evaluation will be carried out with various tests representing 70% of the final mark. It is required to obtain a minimum of 5 points out of 10 in the sum of all the tests carried out per semester.

The mark of the test of the first semester only will be saved for the examination sessions of June and July.

**2.-Seminars:** The coordinated seminars (one each semester) will contribute 10% to the final grade, and the aspects relating to evaluation will be those agreed for coordinated seminars, together with the evaluation rubrics and the memory checklist (to be made public through the virtual platform of the Center, Grado de Nutrición Humana y Dietética). The student must write a report in relation to the seminary about food science matter. Evaluation will be made on the level of understanding of the contents and of the



skills in his/her presentation and discussion.

In the case of the Double Degree (Pharmacy and HND), it will be evaluated written work, presentation, defense and proposed activities up to 10% of the final mark.

**3.-Tutoring:** Evaluation will be made of student attitude and reply to the questions presented in writing as homework in the virtual platform. Tutoring will contribute 10% to the final grade.

**4.-Practical sessions:** Evaluation will be made of the drafting of memoranda and of student attitude in conduction of the practical sessions. This test will represent 10% of the final grade.

Students which did not pass the theoretical and practical examination, their marks from the practical session will be saved during the next two years. After this period, students must repeat again the practical session.

**Participation in the tutorships, seminars and practical sessions is compulsory the first year in order to pass the subject.**

**Remember:**

**-Two coordinated seminars (one for each semester) are required to pass the matter.**

**- Students who are repeating the subject, marks from the tutorials and seminars will be maintained. Marks corresponding to the lab report will be maintained for the following two years after their performing. After this period, lab sessions will have to be repeated.**

**-The subject will not be considered approved, although a mark of 5 is achieved by the sum of the grades for seminars, tutorials, practice and theory, if marks do not met the minimum requirements described in the evaluation section.**

## REFERENCES

### Basic

- ASTIASARÁN I., MARTÍNEZ J.A. Alimentos. Composición y Propiedades. McGraw-Hill: Interamericana. Madrid. 2000.
- BELITZ H.D., GROSCH W. Química de los alimentos. 3ª ed. Acribia Zaragoza. 2012
- BELLO GUTIÉRREZ J. Ciencia bromatológica. Principios generales de los alimentos. Díaz de Santos. 2013.
- FENNEMA O. Química de los alimentos. Acribia. Zaragoza. 4ª edición. 2019.
- GIL HERNANDEZ A. Tratado de Nutrición. Tomo 2. Composición y Calidad Nutritiva de los alimentos. Médica Panamericana. Madrid. 2017.
- ORDOÑEZ J.A. (Editor). Tecnología de los Alimentos. Vol 1 y 2. Alimentos de origen animal. Síntesis. Madrid. 1998.
- PRIMO YÚFERA, E. Química de los Alimentos. Síntesis. Madrid. 1997



### Additional

- ALAIS CH. Ciencia de la leche 2ª ed. Reverté. Barcelona. 1985
- ALEIXANDRE BENAVENT J.L. Vinos y bebidas alcohólicas. Universidad Politécnica de Valencia. Valencia. 1999.
- Cuadernos CDTI. Tecnología de los Alimentos. Departamento de estudios y documentación del Centro para el desarrollo tecnológico industrial. Madrid. 1993.
- DE LAS CUEVAS INSA V. Trazabilidad básico. Ideas propias. Vigo. 2006.
- HOSENEY R. Principios de ciencia y tecnología de los cereales. Acribia Zaragoza. 1991.
- PRICE J.F., SCHWEIGERT BS Ciencia de la carne y de los productos cárnicos. 2ª Edición Acribia Zaragoza. 1994.
- RUITER A. (Coordinador) El pescado y los productos derivados de la pesca: composición, propiedades nutritivas y estabilidad. Acribia. Zaragoza. 1999.
- ADRIAN P., POIFFAIT D. Análisis nutricional de los alimentos. Ed Acribia. Zaragoza. 2003.
- PERIS TORTAJADA M. Problemas y cuestiones de análisis de alimentos. Universidad Politécnica de Valencia. Valencia. 1999.
- CESNID (Centre d'Ensenyament Superior de Nutrició i Dietética) Tablas de composición de alimentos por medidas caseras de consumo habitual en España. McGraw-Hill Interamericana. Barcelona. España. 2008.
- SOUCI SW. FACHMAN W. KRAUT H. Food composition and nutrition tables. Die Zusammensetzung der Lebensmittel Nährwert-Tabellen. La composition des aliments: tableaux des valeurs nutritives. 6th revised and completed edition by Heimo Scherz und Friedrich Senger. Stuttgart: Medpharm: Boca Ratón (etc.):
- [http://www.aecosan.msssi.gob.es/AECOSAN/web/home/aecosan\\_inicio.htm](http://www.aecosan.msssi.gob.es/AECOSAN/web/home/aecosan_inicio.htm)
- <http://www.consumer.es/>
- <http://nal.usda.gov/fnic>
- <http://www.mapama.gob.es/es/>
- <http://www.magrama.gob.es/es/alimentacion/legislacion/>
- <http://www.fao.org/fao-who-codexalimentarius/standards/en/>
- <http://www.alimentacion.es/>
- <https://www.agenda2030.gob.es/objetivos/home.htm>





## **ADDENDUM COVID-19**

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

### **1. Contents**

- The contents initially included in the teaching guide are maintained

### **2. Volume of work and temporary planning of teaching**

- The teaching planning of the different activities in volume of work (ECTS), in days and hours, is maintained but the methodology of the activities changes with respect to the conventional teaching guide, due to the current situation that makes it necessary to adopt a hybrid teaching model.

### **3. Teaching methodology**

#### **Theoretical classes**

- In groups A and B of the NHD it will be carried out through synchronous sessions (synchronized videoconferences on the BBC, or other technology indicated by the Center) and face-to-face. The distribution of students will be done by groups, so that 50% will be in the Faculty classroom while the other 50% will go online, alternating their attendance by weeks. The class will always be held following the schedule (date and time) approved by the Center Board. In the double degree (Pharmacy and NHD) will be carried out through face-to-face sessions for 100% of students following the established schedule.

#### **Tutorials:**

- They will be carried out face-to-face according to the dates set by the course calendar. The students have to upload to the virtual classroom of tutoring the proposed and evaluable activities, to be delivered through the "Task" option (setting the delivery time). Discussion and correction in classroom on the established schedule.

#### **Seminars**

- In groups A and B of the NHD degree the coordinated seminars will all be face-to-face according to the dates marked by the course calendar. The memory presentation, work diary and Power point presentation requirements are maintained.

In the double degree (Pharmacy and NHD) the seminars are not coordinated. They will be done in groups and will be uploaded as a Task to the Virtual Classroom for evaluation. The time scheduled in the academic calendar for this will be done with face-to-face classes.

#### **Practices**

- Made in the first semester



#### **4. Evaluation**

- A face-to-face evaluation of some of the theoretical-practical evaluation tests is foreseen with questions of the same type indicated in the teaching guide 2020-2021 of reasonable limited time (not exceeding 2h). If the sanitary conditions did not allow it, the evaluation would be transformed into an online model.

The proportion of the different evaluable activities is maintained on the final grade established in the 2020-2021 teaching guide, consisting of continuous evaluation with theoretical-practical tests (70%), coordinated seminars (10%), tutorials (10%) and memory -internship sheets (10%).