

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

<b>Code</b>	34109
<b>Name</b>	Nutrition and Food Science
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	6.0
<b>Academic year</b>	2023 - 2024

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. Period</b>
1201 - Degree in Pharmacy	Faculty of Pharmacy and Food Sciences	3 First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1201 - Degree in Pharmacy	9 - Human feeding	Obligatory

**Coordination**

<b>Name</b>	<b>Department</b>
PICO GARCIA, YOLANDA	265 - Prev. Medicine, Public Health, Food Sc., Toxic. and For. Med.

**SUMMARY**

Nutrition and food science is a main subject which is taught during the first semester in the third year of the degree in Pharmacy and comprises a total of 6 credits (1 credit ECTS = 25 h). This subject is, along with Dietotherapy, part of the matter of Human Food, provided in the module of medicine and pharmacology. This course aims to provide the student with the basic knowledge on nutritional needs of the organism and the nutrients that satisfy them. In addition, it is also intended that the gain an understanding of the main (biotic and abiotic) contributors to food toxicity and ways to prevent food poisoning, to interpret legislation in all aspects related to food and to be trained in the physico-chemical analysis of nutrients and contaminants in raw materials and foodstuffs.

These approaches and objectives are aligned with the all the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), so that the acquisition of the learning outcomes of the subject provides training and competence to contribute to some extent to their achievement (as indicated in the outcomes part). However, Goal 2: Zero hunger, Goal 3: Health and well-being, Goal 4: Quality education, Goal 5: gender equity, Goal 6: Clean water and sanitation, Goal 12: Responsible production and consumption and Goal 13: Climate action are more strongly related to



Nutrition and Food Chemistry. Examples of applications of the subject content in relation to the Sustainable Development Goals (SDGs) as well as in the proposed topics for the coordinated seminars. The aim is to provide students with the knowledge, skills and motivation to understand and address the SDGs.

As professionals in the area of Health Sciences, graduates will not be able to avoid the use of these highly topical concepts in their professional future.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

The study of the subject of "Nutrition and Food Science" is based on the practical implementation of many of the knowledge gained in other subjects of first and second course, such as "Physiology", "General chemistry", "Analytical techniques" and "Biochemistry".

## OUTCOMES

### 1201 - Degree in Pharmacy

- To possess and to understand the knowledge in the different areas of study included in the formation of the pharmacist.
- To apply this knowledge to the professional world, contributing to the development of Human Rights, democratic principles, principles of equality between women and men, solidarity, protection of the environment and promotion of a culture of peace with Gender perspective.
- To know how interpret, value and communicate relevant data in the different aspects of pharmaceutical activity, making use of information and communication technologies.
- Skill to communicate ideas, analyze problems and solve them with a critical mind, achieving team-working abilities and assuming leadership whenever required.
- Development of skills to update their knowledge and undertake further studies, including pharmaceutical specialization, scientific research and technological development, and teaching.
- Know how to apply the scientific method and acquire skills in the management of legislation, information sources, bibliography, elaboration of protocols and other aspects that are considered necessary for the design and critical evaluation of preclinical and clinical trials.
- To develop communication and information skills, both oral and written, to deal with patients and other health professionals in the center where they carry out their professional activity. To promote the capacity of work and collaboration in multidisciplinary teams and those related to other health professionals.



- To recognize personal limitations and the need to keep up to date professional competence, paying particular attention to the self-learning of new knowledge based on available scientific evidences.
- To intervene in the activities of health promotion, prevention of illness, in the individual, family and community; with a comprehensive and multi-professional vision of the health-illness process.
- Develop hygienic-sanitary analyzes, especially those related to food.
- Know and handle the basic terminology of Nutrition, Food Science, Dietetics and Diet Therapy.
- To know the nutrients and other components of nutritional interest, as well as the sources, recommendations and the repercussions that would have on health its deficiencies and / or excesses
- To know and apply basic food analyzes to evaluate the composition and nutritional value of the different food groups that are part of the usual diet.
- To issue nutritional and food advice in the professional field, taking into account the difference by gender, physiological or pathological state.
- To know the relationship between food and health as well as the importance of diet in the treatment and prevention of diseases, considering gender biases.
- Acquire the necessary knowledge to evaluate the fitness of the food for consumption.
- Perform the process of nutritional assistance ambulatory and hospital.
- To issue dietary advice on health, fitness and medical nutritional therapy, considering gender differences.

## LEARNING OUTCOMES

### V.I. General

- To understand the importance of proper nutrition to maintain an optimal state of health (SDGs 2 and 3).
- To know and learn how to interpret the legal framework applied to the food (SDGs 2 and 3).
- Mastering the concept of food quality, factors that modify it and the mechanisms of food alteration and preservation (SDGs 2 and 3).
- To justify analytical and health criteria applicable to obtain quality products (SDGs 2 and 3).

### V.II. SPECIFIC

- To know the nutrients and its digestion, absorption, distribution and use by the organism. Their sources, requirements and recommendations (SDGs 2 and 3).
- To have notions and critical view on other components of the food and their effects on health (SDGs 2 and 3).
- Learn the handling and use of food composition tables, and the development of an adequate and balanced diet through the management of a computer program (SDGs 2, 3 and 5).
- To dominate the characteristics of human nutrition at different stages of life (SDGs 2,3 and 5).
- Physico-chemical nutrients and pollutants analysis in raw and processed foods (SDGs 2 and 3).



## DESCRIPTION OF CONTENTS

### 1. Basic Nutrition

Lessons:

- 1.-Food science, nutrition and dietetics. Objectives of the Bachelor of pharmacy education. Bibliographical sources.
- 2.-Food and nutrition. Food: Concept and classification. Nutrients: Concept and classification. Bioavailability of nutrients. Other components of the food. Relationship between food and health. 3.- Requirements and recommendations. Concept. Types of nutritional needs of the human organism. Available nutritional recommendations. Nutritional objectives. Dietary guidelines. Energy needs.
- 4.-Components of energy expenditure. Basal metabolism: concept, factors that influence, calculation and determination. Energy expenditure linked to physical activity. Food thermogenic effect.
- 5.-Carbohydrates. Classification and description. Functions. Recommendations. Dietary sources. Dietary fiber. Composition. Properties. Recommendations. Dietary sources.
- 6.-Lipids. Classification and description. Functions. Requirements and recommendations. Dietary sources.
- 7.-Proteins. Classification. Functions. Criteria for essentiality and complementarity of the amino acids. Evaluation of the quality of the protein. Recommendations. Dietary sources.
- 8.-Water as nutrient: functions, requirements and recommendations.
- 9.-Mineral salts. Classification. Elements controlling functions, requirements and recommendations. Dietary sources. Trace elements.
- 10.-Vitamins. Concept. Water-soluble vitamins. Functions. Needs. Recommendations. Dietary sources.
- 11.-Vitamins and provitamins fat-soluble. Functions. Needs. Recommendations. Dietary sources.
12. Nutrition in the life stages

### 2. Food Science

The composition of foodstuffs, taking into account modifications suffered during the come for those that require it. Highlighting aspects nutritional, hygiene and health of different groups of food in relation to regular consumers.

Lessons:

- 1.- Milk. Structure, stability, and conservation.
- 2.- Meat, fish and eggs. Post-mortem changes. Processed products.
- 3.- Edible fats. Olive oil and vegetable oils. Modified fats. Stability and conservation.
- 4.- Grain. Wheat flour. Bread and pasta. Pastry and confectionery.
- 5.- Vegetables. Production of canned goods. Dried fruits.
- 6.- Vegetables and fruits. Tubers. Cooking and other culinary processes.
- 7.- Water for public consumption. Potabilization.



**3. Food Analysis**

Analytical aspects of food, aimed to acquire practice in basic food analysis: centesimal precisions composition, quality control and determination of additives, to interpret the overall quality of the raw materials and food.

Practices:

- 1.- The moisture determination in food
- 2.- Identification of the proteins of milk
- 3.- Measurement of the density of milk
- 4.- Determination of lipid content of dried fruits
- 5.- Determination of reducing sugars in milk
- 6.- Determination of minerals
- 7.- Investigation and determination of active chlorine in water
- 8.- Determination of tartrazine in a food dye
- 9.- Determination of vitamin C in fruit juices
- 10.- Study of a vegetable canning
- 11.- Determination of alcohol by IR
- 12.-Energetic balance

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Laboratory practices	20,00	100
Seminars	4,00	100
Tutorials	3,00	100
Development of group work	10,00	0
Development of individual work	10,00	0
Study and independent work	30,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	1,00	0
Preparing lectures	20,00	0
Preparation of practical classes and problem	12,00	0
Resolution of case studies	2,00	0
<b>TOTAL</b>	<b>147,00</b>	



## TEACHING METHODOLOGY

The development of the course is structured in:

**Theory classes:** Master class will basically be used in theory classes. The teacher will present the most relevant content on the subject, using audiovisual media necessary for the quick and consistent development of the master classes. The teacher will leave accessible in advance on the platform of teaching "Virtual Classroom", the supporting material need for proper follow-up of theory classes. The theoretical classes enable notably the acquisition of knowledge, and to a lesser extent contribute to the acquisition of procedures and attitudes.

**Practical laboratory sessions** are mandatory. These practices are carried out in five sessions of 4 hours. During the sessions, a "Notebook of practices" with a short theoretical introduction to the practice and the detailed protocol to be followed will be available. During each session students will have to fill the practice workbook, including chemical reactions and the mathematical calculations needed to obtain the results and the final solution. The notebook of practices will be delivered during the week following the completion of the practices and will be corrected by the teacher. The most representative calculations made previously by the student in their time of study will be reviewed during classes. Practical classes contribute primarily to the acquisition of skills, and to a lesser extent to the attitudes and knowledge.

**Seminars:** The seminars will consist of a work with ICTs and study cases discussion.

**Tutorials:** The students will be organized in smaller groups and will be in total 3 evenly distributed at the beginning, middle and end of the semester. The duration of these tutorials will be 1 hour. The tutorials will serve to resolve all doubts that have been able to arise over the theoretical and practical classes.

## EVALUATION

According to those established in the matter of Human Food, the evaluation of the learning of knowledge, competences and skills shall be made in the form of continued assessment throughout the course.

Evaluable parameters are: a) individual and/or collective memories of exercises relating to various activities in classroom and in the laboratory, which will assess the acquisition of skills and attitudes defined ad hoc for the matter, as well as the work carried out by the student and the apprehension of procedures and basic concepts, b) paper written in which will assess the level of general knowledge of theoretical concepts and procedures, c) attitude of the student (valuable from the collective and individual tutorials, practical classes and seminars displayed and discussed in the classroom).

The evaluation will be distributed as follows:

-Acquisition of theoretical concepts and written tests.

-Practical sessions and case studies will contribute to the final note, considering the following points in its evaluation: student attitude, preparation of reports and reports and written tests.



Seminars: the correct presentation and resolution of practical cases will be evaluated. In the case of a presentation will evaluate the scientific content of the work, and the ability of exhibition and discussion with teachers and classmates

The evaluation of the learning of knowledge and skills gained by the students, will be continuously throughout the course. An assessment of the attitude during the classes, including the evaluation of the knowledge acquired from resolution of questionnaires, of the work and seminars carried out by the students, and of the examination will be combined. To pass the subject it is necessary to have obtained a minimum score of 5 out of 10 and pass separately each of the parts.

Evaluation of the theoretical content: the outcome of this evaluation will be 6.0 points in the final score of subject.

The tutorials will qualify with 0.5 points. In this score, in addition to the solution of the proposed tasks, delivery in time and form will be taken into account.

Evaluation of the laboratory practical classes: the qualification obtained in this assessment will be 2.5 points of the final score of the subject. Laboratory practical classes will be assessed through attitude and demonstrated aptitude (0.25 p), the correction of laboratory notebooks (0.25 p), and the solution of practical issues in the final exam (2 p).

Evaluation of seminars: will contribute a maximum of 1.0 point to the final score for this subject. The attitude and ability shown as well as the delivery of practical exercises correctly solved within the deadline will be evaluated. In the case of presentations, the scientific content, preparation, communication skills and ability to defend the work with the teacher and classmates will be assessed.

In the case of failing the subject in the second call, laboratory practices should not be repeated during the following two courses.

Students who do not attend to the exam but have participated and have a score in one / some activities (seminars, laboratory, computers, tutorials...) will be scored in the first call as "Not presented", but in the second call, the score will be based on those obtained in the different activities and will consequently appear as "Not pass".

Copying or plagiarism of any assignment that forms part of the assessment will result in the impossibility of passing the subject, and the student will then be subject to the appropriate disciplinary procedures. Please note that, in accordance with article 13. d) of the University Student Statute (RD 1791/2010, 30 December), it is the duty of a student to refrain from using or cooperating in fraudulent procedures in assessment tests, in the work carried out or in official university documents.

The continuous assessment activities, which in this subject are practices, tutorials and seminars, are of **MANDATORY ATTENDANCE** and, therefore, **NOT RECOVERABLE**, in accordance with the provisions of article 6.5 of the UV Assessment and Grading Regulations for Bachelor's and Master's Degrees.



## REFERENCES

### Basic

- SENC. Guía de la alimentación saludable para atención primaria y colectiva de ciudadanos. Planeta. 2018.
- Gil, A. Tratado de Nutrición. Tomo III: Composición y calidad nutritiva de los alimentos. 3era edición. -Editorial médica panamericana. Buenos Aires. 2017.
- Mataix J. Nutrición para educadores. 2ª ed. Díaz de Santos. Madrid 2005.
- Cameán A. y Repetto M. Toxicología Alimentaria. Díaz de Santos. Madrid 2006.

### Additional

- Moreira O. Tablas de composición de alimentos. 19ª ed. Pirámide. UCM. Madrid. 2018.
- Mataix J. Nutrición y Alimentación Humana. 2ª ed. Ergon. Madrid 2009.
- FESNAD. Ingestas dietéticas de referencia (IDR) para la población española. EUNSA. Pamplona. 2010.