FUNDAMENTALS OF NUTRITION

Degree in Human Nutrition and Dietetics (2026/2027)

Code: 803973
Module: 1
Subject: Fundamentals of Nutrition
Type of subject: Basic
Course: First year
Semester: First
Department: Nutrition and Food Science
Credits: 9 ECTS

TEACHING STAFF

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BRIEF DESCRIPTION

The course deals with the basic principles of nutrition (energy and nutrients, assessment of nutritional status, stages of life and some of the most common pathologies), initiating the student in the knowledge of this science.

COMPETENCIES

General Competencies

- G.C.1.1.
- G.C.1.2.
- G.C.1.3.
- G.C.1.4.
- G.C.2.1
- G.C.2.2
- G.C.2.3
- G.C.4.1.
- G.C.4.2.
- G.C.4.3.
- G.C.4.4.
- G.C.4.5.
- G.C.5.2.
- G.C.5.3.
- G.C.5.4.
- G.C.6.1.
- G.C.8.1.

Specific Competences

- SC.M1.1
- SC.M1.3
- SC.M1.5
- SC.M1.6
- SC.M1.7
- SC.M1.9
- SC.M3.7
- SC.M4.22

OBJECTIVES

1. To know the basics and fundamentals of food and human nutrition.
2. To know the nutritional needs of the human organism.
3. To know the concepts and applications of dietary reference intakes, nutritional targets and dietary guidelines.
4. To know the nutrients, their functions and their metabolic use. To know the basis of nutritional energy balance and its regulation.
5. Assess and calculate nutritional requirements in health and disease at any stage of the life cycle.
6. To know the specific nutritional needs at different stages of life and in special physiological situations.
7. Identify the basics of healthy eating.
8. To know, detect early and evaluate quantitative and qualitative deviations in the energy and nutritional balance.

9. Identify the patient's dietary and nutritional problems and risk factors.
10. To understand the role of diet in the prevention and control of various pathologies.
11. To know basic aspects in the planning of nutrition education campaigns.
12. Ability to solve practical cases.
13. Ability to work as part of a team.
14. Capacity for analysis and synthesis.
15. Ability to discuss and interpret results on the basis of scientific arguments.
16. Capacity for criticism and self-criticism.
17. Capacity to transmit nutrition knowledge to the population.

AGENDA

THEORETICAL

Topic 1. Concept of Food, Nutrition, Bromatology and Dietetics. Relationship with other sciences.
Topic 2. Recommended Intakes (RI) of energy and nutrients. Nutritional objectives. Dietary reference intakes. Dietary guidelines.
Topic 3. Energy. Definition of energy. Components of energy expenditure. Measurement and calculation of energy expenditure
Topic 4. Proteins. Composition, structure and classification. Functions. Essential, non-essential and conditionally essential amino acids. Digestive and metabolic utilisation. Methods for assessing the nutritional quality of proteins. Recommended intakes.
Topic 5. Lipids. Composition, structure and classification. Functions. Essential and non-essential fatty acids, their role in nutrition and health. Dietary cholesterol. Intake recommendations.
Topic 6. Carbohydrates. Composition, structure and classification. Functions. Digestive and metabolic use. Recommended intakes.
Topic 7. Fibre. Composition, structure. Classification. Functions. Dietary sources. Their role in proper nutrition and disease prevention.
Topic 8. Vitamins. Concept. Classification. Water-soluble and fat-soluble vitamins. Functions. Dietary sources. Effects of deficiency and excess. Vitamins in the prevention of some diseases.
Topic 9. Minerals. Concept of minerals. Classification. Macrominerals and trace elements. Functions. Bioavailability. Dietary sources. Effects of deficiency and excess.
Topic 10. Water. Body water. Function, distribution and balance. Adequate water intake and factors that modify it.
Topic 11. Alcohol. Metabolism. Influence of alcohol on nutritional status and health.
Topic 12. Assessment of nutritional status. Dietary surveys. Biochemical and immunological tests. Methods of assessment of body composition
Topic 13. Nutrition during pregnancy and lactation. Physiological changes. Nutritional needs.
Topic 14. Nutrition in the first year of life. Physiological characteristics. Nutritional needs. Breast milk, composition and properties. Artificial feeding. Complementary feeding.
Topic 15. Nutrition in preschoolers, schoolchildren and adolescents. Definition. Characteristics. Nutritional needs.
Topic 16. Nutrition in old age. Ageing process. Nutritional needs.
Topic 17. Nutrition in collectivities. Nutritional needs. Provision of an adequate diet.
Topic 18. Nutrition and sport. Physiology and biochemistry of exercise. Nutritional needs. Considerations to take into account in a competition.
Topic 19. Xenobiotic-nutrient interaction. Effect of xenobiotics on nutrient utilization. Effect of food and nutritional status on drug response.
Topic 20. Eating disorders. Anorexia nervosa, bulimia and others. Characteristics. Dietary recommendations.
Topic 21. Nutritional problems I. Fasting and malnutrition. Concept. Aetiology. Classification. Marasmus and kwashiorkor. Recommended nutrition for restoration of normal nutritional status.
Topic 22. Nutritional problems II. Overweight and obesity. Concept. Dietary recommendations. **Topic 23.** Nutrition and cardiovascular disease. Risk factors. Nutritional factors involved. Recommended diet.
Topic 24. Nutrition and diabetes mellitus (DM). Aetiology. Types and characteristics of DM. Metabolic disorders in DM. Nutrition in the control of DM.
Topic 25. Nutrition and cancer. Nutritional recommendations in cancer prevention.
Topic 26. Food of the future. Personalised nutrition. Nutrigenetics. Nutrigenomics.

PRACTICAL

- Body composition study
- Handling dietary surveys
- Knowledge of the basics of balanced diet design

SEMINARS

- Calculation of energy expenditure
- Handling of food composition tables
- Problems with recommended intakes of energy and nutrients
- Assessment of diet quality

EVALUATION

- The assimilation of theoretical knowledge and the seminars will be assessed on the basis of written tests. The grade for theoretical knowledge will account for 60% of the final grade and for 20% of the final grade for the seminars, and a mark of 5 or more out of 10 must be achieved in both tests independently.
- The score obtained in the evaluation of the practical skills will account for 20% of the final mark and it will be compulsory to pass the practical part of the course (with at least a mark of 5 out of 10) in order to pass the subject.
- ***"Attitude to follow in the event of a voluntary or accidental infringement of the rules for conducting the exam.*** *The voluntary or accidental infringement of the rules for conducting the exam prevents the assessment of the same, so that the offending student will sit the oral exam of the subject to establish their knowledge of the subject. If the cheating is confirmed as intentional, it will be considered a very serious misconduct, and the Services Inspectorate will be informed in order to take the disciplinary measures it deems appropriate".*

BIBLIOGRAPHY/RELATED INTERNET LINKS

Basic Bibliography

- Biesalki HK (2021). Texto y atlas de nutrición. 8ª ed. Barcelona: Elsevier.
- Carbajal A (2013). Manual de Nutrición y Dietética. Madrid: Universidad Complutense.
- Gil A (2024). Tratado de Nutrición. 4ª ed. Madrid: Editorial Médica Panamericana.
- Raymond JL, Morrow K (2021). Krause, Mahan, Dietoterapia. 15ª ed. Barcelona: Elsevier.
- Mataix FJ (2009). Nutrición y alimentación humana. Tomo I. Nutrientes y alimentos. Tomo II. Situaciones fisiológicas y patológicas. 2ª ed. Madrid: Editorial Ergon.
- Ortega RM (2022). Nutrición clínica y salud nutricional. Madrid: Ed. Panamericana.
- Ortega AM, Requejo AM (2025). Nutriguía. Manual de nutrición clínica. 3ª ed. Madrid: Editorial Medica Panamericana.

Specific Bibliography

- Institute of Medicine (2000). Dietary Reference Intakes: Applications in Dietary Assessment. Washington (DC): National Academy Press.
- National Academy of Sciences, Engineering, and Medicine (NASEM) (2023). Dietary Reference Intakes for Energy. Washington (DC): National Academy Press.
- Serra Ll, Aranceta J (2006). Nutrición y salud pública. Métodos, bases científicas y aplicaciones. 2ª ed. Barcelona: Editorial Masson.
- Ross AC, Caballero B, Cousins RJ, Ziegler TL, Tucker KL (2014). Nutrición en la salud y enfermedad, 11ª ed. Walters Kluwer.
- Marriott BP, Birt DF, Stallings VA, Yates AA (2020). Present knowledge in nutrition, 11ª ed. ILSI, Academic Press.

Links and Web Resources of Interest

- AECOSAN - Agencia Española de Consumo, Seguridad Alimentaria y Nutrición.
- EFSA - European Food Safety Authority.
- FAO - Food and Agriculture Organization of the United Nations.
- WHO - World Health Organization.