1. OVERVIEW

Subject Area	Human Genetics
Degree	Human Nutrition and Dietetics
School/Faculty	Biomedical and Health Sciences
Year	Second
ECTS	3
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On-campus and blended
Semester	Fourth
Coordinating professor	Dr Esmeralda Parra-Peralbo

2. INTRODUCTION

Compulsory subject area within Module 4 'Nutrition, Dietetics and Health Sciences', delivered over one semester in the second year. The subject area of Human Genetics is worth 3 ECTS credits.

Human Genetics is considered a highly influential field in many areas related to health sciences. In relation to nutrition it is a fundamental tool, on the one hand, for the knowledge and understanding of many physiological processes related to food metabolism, and on the other hand, to combine the influence of people's lifestyles with that of inherited traits on the development of major diseases such as diabetes or obesity. Throughout the subject area, students will learn the fundamentals and molecular basis of human genetics, learn about the concepts of genetic variability, regulation and transmission and will analyse the most relevant diseases with a genetic basis in the context of nutrition.

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.
- CB5: Students have developed the learning skills necessary to undertake further study in a much more independent manner.

General skills (CG, by the acronym in Spanish)

- CG13: Understand and assess the relationship between food and nutrition in situations of health and situations of illness.
- CG14: Apply scientific knowledge of physiology, pathophysiology, nutrition and food to dietary planning and advice for individuals and groups of all ages, including both healthy and unwell people.
- CG15: Design and implement protocols for assessing nutritional status, identifying nutritional risk factors.

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.
- CT6: Problem solving: ability to solve an unclear or complex issue or situation which has no established solution and requires skill to reach a conclusion.
- 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)

- CE110: Know the fundamentals of genetics and the molecular bases of genetic information.
- CE111: Understand the variability and maintenance of genetic information, the regulation of gene expression and the transmission of genetic information.
- CE112: Be familiar with genetic disorders.

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

- RA1: Know the foundations of genetics. Molecular bases of genetic information. Mendelian and Non-Mendelian genetics.
- RA2: Be familiar with the variability and maintenance of genetic information.
- RA3: Know how gene expression is regulated.
- RA4: Know how genetic information is transmitted.
- RA5: Be familiar with major genetic disorders.

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

Skills	Learning outcomes
CB2, CB3, CB5, CE110, CT6, CT7.	Know the foundations of genetics. Molecular bases of genetic information. Mendelian and Non-Mendelian genetics.
CB2, CB3, CB5, CE110, CE111, CT6, CT7, CT9.	Be familiar with the variability and maintenance of genetic information.
CB2, CB3, CB5, CE110, CE111, CT6, CT7, CT9.	Know how gene expression is regulated.
CB2, CB3, CB5, CG14, CG15, CE110, CE111, CE112, CT6, CT7.	Know how genetic information is transmitted.
CB2, CB3, CB5, CG13, CG14, CG15, CE112, CT1, CT6, CT7, CT9.	Be familiar with major genetic disorders.

4. CONTENTS

Corresponding topics:

UNIT 1: The nature of genetics.

TOPIC 1. Mendel's principles.
TOPIC 2. Beyond Mendel: studies of genetic linkage.
TOPIC 3. Structure and variability of the human genome.

UNIT 2: Quantitative and population genetics. **TOPIC 4.** Inheritance of complex traits.
TOPIC 5: Population genetics.

UNIT 3: Genetics, Health and Nutrition.

TOPIC 6. Monogenic and polygenic metabolic disorders.
TOPIC 7. Interaction between genes and nutrients.

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Lecture
- Collaborative learning
- Case studies
- Problem-based and project-based learning
- Learning based on workshops/labs

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	25
Independent working	21
Case studies	6
Group activities	4
Written reports and strategies	4
Workshops and/or lab work	5
Knowledge test	3
Tutorials	7
TOTAL	**75**

Blended learning

Learning activity	Number of hours
Reading of content	14
Online seminars	11
Independent working	22
Case studies	6
Group activities	4
Written reports and strategies	4
Workshops and/or lab work	5
Online tutorials	7
Knowledge test	2
TOTAL	**75**

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	50%
Performance observation	10%
Laboratory work	20%
Submission of reports and essays	10%
Participation in debates	10%

Blended:

Assessment method	Weighting
Knowledge test	50%
Performance observation	10%
Laboratory work	20%
Submission of reports and essays	10%
Participation in debates	10%

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:

- Klug, W. S., Spencer, C. A., Cummings, M. R., Bueno i Torrens, D., & Ménsua, J. L. (2006). Conceptos de genética. Madrid [etc.]: Pearson Educación.
- Novo Villaverde, F. J. (2007). Genética humana: conceptos, mecanismos y aplicaciones de la genética en el campo de la biomedicina. Madrid: Pearson.
- Thompson & Thompson (2016). Genética Médica. Madrid. Elservier

The recommended bibliography is indicated below:

- Florez, J. C. (2016). The Genetics of Type 2 Diabetes and Related Traits: Biology, Physiology and Translation. (S. (Online service), Ed.). Cham: Springer International Publishing.
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- Hollar, D. (2016). Epigenetics, the Environment, and Childrens Health Across Lifespans. (S. (Online service), Ed.). Cham: Springer International Publishing.
- Genetics Home Reference: https://ghr.nlm.nih.gov/
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